frontiers | Research Topics

New approaches for improving equity in mental health research, treatment, and policy

Edited by
Edmund Howe, Virginia A. Brown, Lexi C. White and Julia Knopes

Coordinated by
Joanne Suarez

Published in
Frontiers in Public Health
Frontiers in Psychiatry

ISSN 1664-8714
ISBN 978-2-8325-6907-8
DOI 10.3389/978-2-8325-6907-8

Generative AI statement
Any alternative text (Alt text) provided alongside figures in the articles in this ebook has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

About Frontiers

Frontiers is more than just an open access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers journal series

The Frontiers journal series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the *Frontiers journal series* operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public - and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews. Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the *Frontiers journals series*: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area.

Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers editorial office: frontiersin.org/about/contact

New approaches for improving equity in mental health research, treatment, and policy

Topic editors

Edmund Howe — Uniformed Services University of the Health Sciences, United States

Virginia A. Brown — The University of Texas at Austin, United States

Lexi C. White — Banner Health, United States

Julia Knopes — Case Western Reserve University, United States

Topic coordinator

Joanne Suarez — Prospera Institute, United States

Citation

Howe, E., Brown, V. A., White, L. C., Knopes, J., Suarez, J., eds. (2025). *New approaches for improving equity in mental health research, treatment, and policy*. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-8325-6907-8

Table of contents

frontiers | Frontiers in Psychiatry

TYPE Editorial
PUBLISHED 10 September 2025
DOI 10.3389/fpsyt.2025.1666093

OPEN ACCESS

EDITED AND REVIEWED BY
Wulf Rössler,
Charité University Medicine Berlin, Germany

*CORRESPONDENCE
Joanne C. Suarez
jsuarez@prosperainstitute.org

RECEIVED 15 July 2025
ACCEPTED 16 July 2025
PUBLISHED 10 September 2025

CITATION
Suarez JC, Knopes J, White LC, Brown VA and Howe E (2025) Editorial: New approaches for improving equity in mental health research, treatment, and policy.
Front. Psychiatry 16:1666093.
doi: 10.3389/fpsyt.2025.1666093

Editorial: New approaches for improving equity in mental health research, treatment, and policy

Joanne C. Suarez[1]*, Julia Knopes[2], Lexi C. White[3], Virginia A. Brown[4] and Edmund Howe[5]

[1]Prospera Institute, Boston, MA, United States, [2]Case Western Reserve University School of Medicine, Cleveland, OH, United States, [3]Banner Health, Phoenix, AZ, United States, [4]Hastings Center, Garrison, TX, United States, [5]Uniformed Services University of the Health Sciences, Bethesda, MD, United States

KEYWORDS

psychiatry, mental health, policy, community engaged bioethics, social justice

Editorial on the Research Topic

New approaches for improving equity in mental health research, treatment, and policy

This Research Topic emerges directly from the shared goals of the *Frontiers in Psychiatry* Editorial Committee and the Frontiers team to advance inclusion, innovation, and equity in mental health research and publishing. As we collectively work to close the gap between scientific discovery and real-world community impact, we recognize that elevating the voices and perspectives of persons living with mental health illnesses and/or conditions is no longer optional—it is essential. This collection of twenty articles collectively endeavors to improve access to essential care for individuals grappling with mental illness. The authors examine the many challenges faced by diverse patient populations who are disadvantaged in their pursuit of mental health support. These more vulnerable individuals differ in age, financial status, race, ethnicity, gender identities, and location—including in both Western and Eastern societies (Hu et al.; Garuma et al.). The articles explore equity in global contexts, demonstrating—through both quantitative and qualitative methods—that mental health is shaped not only by psychotherapeutic or pharmacological treatment, but by structural and social factors like stigma, poverty, cultural beliefs, and family support.

In line with the focus of this Research Topic—*New Approaches for Improving Equity in Mental Health Research, Treatment, and Policy*—we bring forward scholarship that not only engages with underrepresented experiences but also challenges the norms of who participates in, benefits from, and leads mental health research. This vision resonates with broader efforts to push the boundaries of who defines ethical inquiry and to build frameworks that are braver, broader, and more attuned to social justice (1). Such approaches demand that we not only include underrepresented communities but also reshape the ethical foundations of mental health research to reflect their lived realities. Grounded in a commitment to ethical rigor and community relevance, this collection invites authors to help reimagine a research landscape that centers those most affected by psychiatric systems—particularly persons living with conditions that are

underacknowledged to others; from underrepresented communities such as Black, Latinx, and LGBTQ+ populations; whose values and experiences are shaped by cultural beliefs beyond biomedicine; and whose access to care is limited by geography or constrained by broader structural inequities.

Issue overview

Here we provide an overview of selected articles to prime your reading experience.

Let us begin within the French context, where Fond et al. found that people with schizophrenia living in poverty—despite having access to medical care—still experienced worse health outcomes, inconsistent housing, and fewer opportunities for social engagement. Through their study, the authors uncovered new directions for inquiry when noting "surprisingly, individuals in poverty reported higher self-esteem levels compared to their wealthier counterparts". The results emphasize the importance of examining protective psychological and cultural factors within low-income populations while noting the positive finding that poverty was not associated with diminished social functioning or quality of life. Contributions by Edalati et al. direct attention to the intersection of substance use and mental health concerns, especially within Indigenous and other underserved populations in Canada. The authors highlight that the grip of physiological dependence from substance use may be even harder to overcome than the mental illness itself, and argue for the need to integrate treatment structures across systems to effectively support individuals with co-occurring conditions. Articles in this issue also provide additional context for understanding how mental health conditions intersect with other identities and social locations. For instance, Osman et al. highlight the co-occurrence of anxiety and depression during the postnatal period and challenge the tendency to silo these conditions, underscoring the need for care models that reflect the complexity of lived experience among birthing people whose symptoms may be overlooked or minimized. Contributions by Fu et al. focused on aging populations, specifically those experiencing dementia, while amplifying the critical role community health systems play in supporting recovery and stability for aging populations over time. Here, Camacho et al. present a compelling example of participatory social network research in Colombia by mapping gaps in the mental health service landscape through community collaboration. An approach that mirrors broader calls to integrate structural and intersectional competencies into care delivery Howe (2) such as encouraging providers to ask not only about symptoms but also about external stressors—like whether a patient has transportation to the clinic or access to childcare.

Though many articles in this issue underscore the importance of participatory approaches to mental health research that center the voices of people with lived experiences of mental health conditions, future scholarship should remain mindful of the complexity and nuance of involving psychiatric service users with lived experience of mental health conditions as research collaborators. Scholars like Faulkner (3) and Rose (4) caution that while people with mental health conditions should be engaged as equal partners in research who contribute expertise in the form of lived experience, their voices are often devalued when they do not align with prevailing psychiatric or social scientific understandings of mental health and established methods of collecting and interpreting data. Guidry-Grimes (5) similarly notes that clinicians often fail to engage people with mental health diagnoses in shared decision making, which might extend to a belief in psychiatric and mental health research that people with mental health conditions lack insight and the ability to contribute to or innovate on research. Across several pieces, the literature calls us to carefully assess justice in mental health—both within and beyond clinical settings (6).

Beyond the listed intersectional perspectives, the issue also surfaces urgent ethical dilemmas, such as those surrounding involuntary hospitalization. Aguirre et al. and Howe (7) explore how patients with severe suicidal ideation may resist hospitalization, while providers, fearing liability, may default to hospitalization even when other forms of support are viable. The authors argue that although hospitalization can offer short-term safety, it can also increase long-term trauma and risk. Howe proposes that providers consider strategies rooted in patient autonomy—such as scheduled check-ins and affirming patient self-knowledge—as alternatives to premature hospitalization. These approaches encourage patients to signal when they feel safe versus when additional support is needed, helping to build trust and preserve dignity in the treatment process. As this issue includes calls for affirmative, anti-ableist models of care and scholarship, Yu (8) reminds us that ableism continues to shape assumptions about capacity and worth, especially for people with disabilities and psychiatric diagnoses. Heinze et al. explores mental health outcomes among visually impaired populations, revealing that approximately nine out of ten Black participants expressed feelings of determination and resilience in the face of their visual impairment. The study highlights that black participants, despite systemic challenges encountered with visual limitations, report higher levels of optimism and self-acceptance compared to other groups. While the basis for this optimism remains unclear, the study suggests that cultural and community-based factors may play a protective role—another area ripe for future exploration. With gender and sexual identity emerging as powerful dimensions of analysis, Hambruch et al. and Alibudbud address mental health among LGBTQ+ individuals. They advocate for affirmative psychotherapy practices that validate identity, reduce internalized stigma, and acknowledge the compounding effects of minority stress. As the historical exclusion of women from research is now broadly accepted, and increasing attention is being paid to the mental health needs of birthing people, a call for inclusive language —like "pregnant persons"—is also emphasized as a deliberate act of recognition for individuals who may not identify within traditional gender categories.

Despite the serious challenges highlighted across the Research Topic, many of the authors propose tangible, hopeful solutions. Lei et al. argues that burnout in academic and professional spaces can

be mitigated through thoughtful hiring practices and attention to role fit. Ding et al. expands cancer treatment models to consider the emotional needs of patients' partners, offering a dyadic coping framework that could improve medical outcomes through relational care. These ideas reflect a broader paradigm shift: one that embraces holistic, interconnected understandings of health. Authors also highlight the importance of training and systems-level adaptation. In Turkey, primary care providers with in-service psychiatric training were significantly more confident and effective in prescribing psychotropic medications. As antidepressants, mood stabilizers, and benzodiazepines become more commonly used, this training is increasingly vital. Articles recommend expanded telepsychiatry programs and cross-disciplinary collaborations with pharmacies to increase access and medication literacy, particularly in rural and underserved areas. Elsewhere, innovations include low-tech solutions such as disseminating mental health information via radios during emergencies or leveraging smartphones to expand treatment access in resource-limited settings. Collectively, these strategies demonstrate that impactful change doesn't always require high-tech interventions—just thoughtful, human-centered design.

Conclusion

The overall ethical thrust of this Research Topic is to prioritize those who have historically been excluded or underserved. From the structurally marginalized to those navigating conditions, this Research Topic calls for a research and treatment paradigm grounded in collaboration, dignity, and justice. Authors remind us that in order to improve equity in mental health, we must reflect on what kinds of knowledge are valued, whose voices are invited in, and how we design systems that meet people where they are. This Research Topic ultimately asks mental health professionals, researchers, and policymakers to reimagine what's possible when those most affected by psychiatric systems are seen not just as subjects of research, but as co-creators of solutions. We hope the work shared here sparks new insights and shared commitment to advancing a more just, inclusive, and healing mental health future.

As you read through this Research Topic, we invite you to consider the variety of voices, practice perspectives, and themes that emerge—particularly as this Research Topic highlights how intersecting factors render individuals with serious mental illnesses more vulnerable.

Author contributions

JS: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Writing – review & editing. JK: Conceptualization, Methodology, Writing – review & editing. LW: Methodology, Writing – review & editing. VB: Supervision, Writing – review & editing. EH: Formal analysis, Methodology, Supervision, Writing – original draft.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

References

1. Suarez JC. Latinx bioethics: toward a braver, broader, and more just bioethics. *Hastings Center Rep*. (2022) 52(S1):60-62. doi: 10.1002/hast.1373

2. Howe EG. How providers can acquire structural and intersectional competencies. *J Clin ethics*. (2025) 36(2):105–11. doi: 10.1086/734480

3. Faulkner A. Survivor research and Mad Studies: the role and value of experiential knowledge in mental health research. *Disability Society*. (2017) 32:1–21. doi: 10.1080/09687599.2017.1302320

4. Rose DS. *Mad knowledges and user-led research*. Springer Nature (2022).

5. Guidry-Grimes L. Overcoming obstacles to shared mental health decision making. *AMA J Ethics*. (2020) 22(5):E446–451. doi: 10.1001/amajethics.2020.446

6. Knopes J, Guidry-Grimes L. Reframing mental health ethics. *Community Ment Health J*. (2024) 60(2):208–14. doi: 10.1007/s10597-023-01189-

7. Howe EG. When, if ever, should care providers neither contact families of suicidal patients to gain more information nor hospitalize them? *J Clin ethics*. (2023) 34(2):1–6.

8. Yu T. *The Anti-Ableist Manifesto*. Hachette Go. (2024).

frontiers | Frontiers in Psychiatry

TYPE Opinion
PUBLISHED 22 June 2023
DOI 10.3389/fpsyt.2023.1189231

OPEN ACCESS

EDITED BY
Julia Knopes,
Case Western Reserve University, United States

REVIEWED BY
Lexi White,
WellStar Health System, United States
Sérgio A. Carvalho,
University of Coimbra, Portugal

*CORRESPONDENCE
Rowalt Alibudbud
✉ rowalt.alibudbud@dlsu.edu.ph

RECEIVED 18 March 2023
ACCEPTED 09 June 2023
PUBLISHED 22 June 2023

CITATION
Alibudbud R (2023) Gender in mental health: toward an LGBTQ+ inclusive and affirming psychiatry and mental healthcare in the Philippines. *Front. Psychiatry* 14:1189231. doi: 10.3389/fpsyt.2023.1189231

Gender in mental health: toward an LGBTQ+ inclusive and affirming psychiatry and mental healthcare in the Philippines

Rowalt Alibudbud*

Department of Sociology and Behavioral Sciences, De La Salle University, Manila, Philippines

KEYWORDS

sexual and gender minorities, LGBT persons, gender affirmation, Mental Health Act, gender equality, Philippines, SOGIE Equality Bill, mental health

1. Introduction

The Philippines enshrined in its constitution the commitment to uphold the rights of all people regardless of gender (1–3). Toward this commitment, it has been considered the most gender-equal country in Asia in the Gender Gap index (4). However, discrimination against lesbians, gay men, bisexuals, transgenders, queers, and other individuals with diverse genders and sexual identities (LGBTQ+) remained persistent (1–3). In addition, negative attitudes toward gay men and lesbians have been reported by about a quarter of the Filipino population over the years (5–7). Moreover, a study involving Filipino students found that non-gender-variant participants reported more genderism and transphobia than their gender-variant peers (8). Furthermore, another study found that these negative societal attitudes may translate to high self-stigma among LGBTQ+ individuals (9).

The continued negative attitudes against LGBTQ+ Filipinos and their self-stigma can lead to higher rates of mental disorders (1, 9–21). Therefore, there is a need for mental healthcare that is responsive to the needs of LGBTQ+ Filipinos. However, these negative attitudes toward LGBTQ+ Filipinos have also been reported among mental health professionals. For instance, a Filipino psychologist on a national television show advised parents with LGBTQ+ children to consider conversion therapy to achieve a "happy family life" despite evidence of its deeply damaging consequences (10). These negative attitudes are further complicated by the limited number of trained counselors who can address their depression, suicidal tendencies, self-acceptance, anger, and family relationship issues, as highlighted by a UNDP and USAID report (2). Thus, in accordance with the Philippine Mental Health Act's guaranteed rights and protection from sexual orientation, gender identity, and expression (SOGIE)-based discrimination of service users (22), this opinion paper discusses several steps that can be undertaken to achieve inclusive and affirming mental healthcare for LGBTQ+ people in the country.

2. Negative attitudes and discrimination against LGBTQ+ Filipinos

Negative attitudes and discrimination against LGBTQ+ Filipinos may stem from Philippine heteronormative norms that promote a gender binary perspective (1, 2, 5–7). In this perspective, only men and women are acknowledged, disregarding the spectrum and diversity of SOGIE (1, 2, 5–7). These norms are rooted in colonial, religious, and cultural factors. Furthermore, they are reflected in Philippine societal positions, laws, and attitudes

toward LGBTQ+ individuals (1–3, 5–8). For instance, the proposed SOGIE Equality Bill, which seeks to penalize SOGIE-based discrimination, institute redress mechanisms for discrimination, and establish programs that promote non-discrimination and diversity, has languished in the Philippine Senate for about 20 years (1, 2, 23). The most common argument against this bill is religious immorality, including some politicians who consider LGBTQ+ Filipinos 'worse than animals' (1–3, 5).

3. Minority stress, negative attitudes, discrimination, and mental health

Meyer's minority stress model identifies distal and proximal stressors as risk factors that can contribute to the higher rates of mental disorders among LGBTQ+ individuals (17). Internal processes, such as self-stigma and internalized homophobia, are considered proximal stressors (17). On the other hand, negative attitudes and discrimination, such as those experienced by LGBTQ+ Filipinos, are considered distal stressors or external objective stressful events (9–21). In the Philippines, evidence suggests that self-stigma, negative attitudes, and discrimination against LGBTQ+ Filipinos contribute to poor mental health, including their higher rates of suicidal ideations, depression, anxiety, and stress than the general population (1, 9–16, 18–21). Therefore, there is a need for measures that promote inclusive and affirming mental health for LGBTQ +. This is in keeping with the country's recent pledge to respond to the gendered needs of people with mental health concerns in its recently enacted Mental Health Act (22). Herewith, this opinion paper proposes several steps that can be undertaken to promote LGBTQ+ inclusive and affirming mental healthcare in the Philippines.

4. Discussion

4.1. Philippine professional organizations involved in mental healthcare can commit to LGBTQ+ inclusive and affirming mental healthcare practices

The past role of mental health professionals, particularly psychiatrists, in spreading the enduring stigma against LGBTQ+ people gives them a responsibility to affirm the diversity of SOGIE and oppose attempts to change it (24, 25). In recent years, the Philippine mental health professions also participated in this LGBTQ+ stigma promulgation (i.e., the promotion of Conversion therapy) (7, 10). Thus, there is a need for Philippine professional organizations involved in mental healthcare to uphold the rights and affirmation of LGBTQ+ identities and the diversity of SOGIE. By doing so, distal stressors that stem from mental health care can be avoided and reduced (1, 9–21). Furthermore, this assurance from professional organizations involved in mental healthcare is a welcome signal to LGBTQ+ Filipinos that their identities are respected in psychiatric and mental healthcare practices.

The Philippine Psychological Association (PAP) recently instituted its commitment to gender-affirming mental healthcare through its policy statement calling on psychologists "to ensure the advancement of LGBTQ+ rights and welfare" (10). Similarly, other Philippine professional organizations, such as the Philippine Psychiatric Association (PPA) and the Philippine Guidance and Counseling Association (PGCA), should also call on their members to uphold the commitment to advance LGBTQ+ inclusion, affirmation, and rights in their professional practice.

4.2. Professional organizations, higher education institutions, and hospitals in the Philippines can abolish the practice of conversion therapy and integrate LGBTQ-affirmative therapy in psychiatric and mental health training programs

Organizational commitment to LGBTQ+ inclusivity and affirmation in mental healthcare should be paralleled with actions among individual members. As a first step, Philippine professional organizations involved in mental healthcare need to abolish and oppose the practice of conversion therapy. Conversion therapy rejects an individual's inherent identity (24–27). Moreover, conversion therapy not only leads to poor mental health but may also violate a constitutionally guaranteed human right (24–27). Thus, psychiatrists and other mental health professionals must commit themselves to end this practice.

To further advance action at the individual level, psychiatrists and other mental health professionals should have the competency and understanding of gender affirmation and inclusivity in their practice (24, 25). However, in the Philippines, LGBTQ+ organizations have highlighted that few people are trained to address their mental health concerns (2). For instance, psychiatrists and other mental health professionals can train on and practice affirmative therapy, defined as "a type of psychotherapy used to validate and advocate for the needs of sexual and gender minority clients" (28). Likewise, promising sexual and gender-affirmative mental healthcare practices, such as affirmative psychotherapy principles and affirmative Cognitive Behavioral Therapy, can be studied, adapted, and expanded in the Philippines (29, 30). Affirmative Cognitive Behavioral Therapy, which validates stigmatized identities by acknowledging the impact of their sexual and gender identity-based stigma and targeting their cognitive, affective, and behavioral processes, has shown promise in combatting the increased rates of distress among LGBTQ+ individuals (29). Similarly, practicing affirmative psychotherapy principles, such as normalizing the impact of minority stress, decreasing avoidance, restructuring minority stress cognitions, and empowering and validating the unique strengths of LGBTQ+ individuals, may help them cope with minority stress, including internalized homophobia (30). These affirmative mental healthcare practices can be supplemented by studying and incorporating the effects of promising medical interventions, such as gender-affirmative hormone therapy (e.g., testosterone or estrogen), which have shown promising results in improving the psychosocial functioning of gender-diverse people (31). Thus, universities and colleges with mental health-related degree programs (i.e., counseling and psychology), as well as hospitals with psychiatric

residency training programs, in the Philippines need to upscale and integrate gender-affirmative therapy into their training and research programs. Doing so can foster and nurture future generations of LGBTQ+ supportive psychiatrists and mental health professionals.

4.3. The Philippine government can include LGBTQ+ mental health as a national research agenda

While previous studies suggest that distal stressors contribute to poor mental health among LGBTQ+ Filipinos, they also highlighted that the determinants of mental health problems among LGBTQ+ Filipinos might vary from the general population (1, 8, 11–13, 18). This variation is accounted for by the unique cultural features of Philippine society, such as its colonial patriarchal norms (1–3, 8, 11–13). For example, a romantic relationship was found to be protective among heterosexual cisgender Filipinos but not among LGBTQ+ individuals (1). Thus, previous studies emphasized the need for further research to understand and address the mental health disparities among LGBTQ+ Filipinos (1, 11–16). This need is echoed by local LGBTQ+ organizations in a national dialogue with the UNDP and USAID, where they emphasized that there is poor information on their mental health (2). This limited information on LGBTQ+ mental health may reflect the apparent invisibility of LGBTQ+ Filipinos in the local mental health literature. Thus, moving their mental health agenda from the margins to the center is necessary to address their invisibility and mental health needs. As a start, the Philippine Department of Science and Technology, the government agency mandated to provide the direction and leadership of scientific and technological efforts in the country, can include LGBTQ+ research in the Philippines' National Research and Development Agenda under its mental health section.

4.4. Psychiatrists and other mental health professionals can advocate for LGBTQ+ rights and welfare

The Philippine society itself, with its heteronormative norms, negative attitudes, and continuous discrimination, can be a fertile ground for minority stress that accounts for the high rates of mental disorders among Filipinos with LGBTQ + (1–3, 5, 23). Hence, as patient advocates, psychiatrists and other mental health professionals in the Philippines need to advocate for a more gender-affirming society conducive to the mental health of all individuals, such as supporting the proposed SOGIE Equality Bill. By supporting this bill and the societal effort to decrease SOGIE-based discrimination and negative attitudes, psychiatrists and other mental health professionals take part in the systemic reduction of minority stress that may contribute to mental health disparities among LGBTQ+ Filipinos (1, 2, 8, 11–16, 18–21).

5. Conclusion

In general, Filipino psychiatrists and other mental health professionals should affirm and advocate the plurality of SOGIE at both the individual and the social levels. Among others, inclusive and affirming mental health and psychiatric services for LGBTQ + can be achieved in the Philippines by committing to gender inclusivity, opposing conversion therapy, integrating affirmative therapy for LGBTQ in training programs, including LGBTQ + mental health in the Philippine research agenda, and advocating for the rights and freedoms of these marginalized individuals in Philippine society. In doing so, the Philippines can be the country with the most gender equality in Asia, which is inclusive of the spectrum and diversity of sexualities and genders as well as conducive to mental health.

Author contributions

RA had substantial contributions to the design, drafting, revision, acquisition, interpretation, and final approval of the data and work.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Alibudbud RC. "Does sexual orientation matter?": a comparative analysis of the prevalence and determinants of depression and anxiety among heterosexual and non-heterosexual college students in a University in Metro Manila. *J Homosex.* (2023) 70:1119–37. doi: 10.1080/00918369.2021.2015953

2. United Nations Development Programme & United States Agency for International Development. *Being LGBT in Asia: The Philippines Country Report.* United Nations Development Programme (2014). Available online at: https://www.undp.org/publications/being-lgbt-asia-philippine-country-report? (accessed May 31, 2022).

3. Human Rights Watch. *"Just Let Us Be" Discrimination Against LGBT Students in the Philippines*. (2017). Available online at: https://www.hrw.org/report/2017/06/21/just-let-us-be/discrimination-against-lgbt-students-Philippines (accessed May 31, 2022).

4. World Economic Forum. Global Gender Gap Report. *World Economic Forum*. (2021). Available online at: https://www3.weforum.org/docs/WEF_GGGR_2021.pdf (accessed May 31, 2022).

5. Manalastas EJ, Ojanen TT, Torre BA, Ratanashevorn R, Hong BC, Kumaresan V, et al. Homonegativity in southeast Asia: attitudes toward lesbians and gay men in Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. *Asia-Pacific Social Science Review*. (2017) 17:25–33.

6. Manalastas EJ, Del Pilar GE. Filipino attitudes toward lesbians and gay men: secondary analysis of 1996 and 2001 national survey data. *Philip J Psychol*. (2005) 38:53–74.

7. Santos NJ. *[OPINION] It's Not Okay to Pray the Gay Away*. Philippines: Rappler (2021). Available online at: https://www.rappler.com/voices/ispeak/opinion-not-okay-pray-gay-away/ (accessed March 18, 2023).

8. Willoughby BL, Hill DB, Gonzalez CA, Lacorazza A, Macapagal RA, Barton ME, Doty ND. Who hates gender outlaws? A multisite and multinational evaluation of the Genderism and Transphobia Scale. *Int J Transgen*. (2010) 12:254–71. doi: 10.1080/15532739.2010.550821

9. Reyes ME, Lanic PJ, Lavadia EN, Tactay EF, Tiongson ER, Tuazon PJ, et al. Self-stigma, self-concept clarity, and mental health status of Filipino LGBT individuals. *N Am J Psychol*. (2015) 17:343–50.

10. Manalastas EJ, Torre BA. LGBT psychology in the Philippines. *Psychol Sexual Rev*. (2016) 7:60–72. doi: 10.53841/bpssex.2016.7.1.60

11. Alibudbud R. Gender in mental health: comparison of the rate and social factors of depression, anxiety, and stress among young adult Filipino heterosexual cisgender men and women and LGBT+ individuals. *Int J Soc Psychiatry*. (2023) 69:430–7. doi: 10.1177/00207640221106874

12. Alibudbud R. Gender in mental health: comparing the rate and social factors of depression, anxiety, and stress among young heterosexual and sexual minority women in the Philippines. *J Lesbian Stud*. (2023) 27:74–88. doi: 10.1080/10894160.2022.2091731

13. Alibudbud R. Gender in mental health: relationship of spirituality, social support, and COVID-19-related fear among heterosexual and LGBTQ+ youth. *Front Sociol*. (2023) 7:1102664. doi: 10.3389/fsoc.2022.1102664

14. Cleofas JV, Alibudbud RC. Emerging from a two-year-long quarantine: a retrospective study on life satisfaction trajectory and depression among young LGBTQ+ students in the Philippines. *SAGE Open Nurs*. (2023) 9:23779608231158980. doi: 10.1177/23779608231158980

15. Manalastas EJ. Sexual orientation and suicide risk in the Philippines: evidence from a nationally representative sample of young Filipino men. *Philip J Psychol*. (2013) 46:1–3.

16. Manalastas EJ. Suicide ideation and suicide attempt among young lesbian and bisexual Filipina women: evidence for disparities in the Philippines. *Asian Women*. (2016) 32:101–20. doi: 10.14431/aw.2016.09.32.3.101

17. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull*. (2003) 129:674–97. doi: 10.1037/0033-2909.129.5.674

18. Reyes ME, Victorino MC, Chua AP, Oquendo FY, Puti AS, Reglos AA, et al. Perceived parental support as a protective factor against suicidal ideation of self-identified lesbian and gay Filipino adolescents. *N Am J Psychol*. (2015) 17:245–50.

19. Reyes ME, Davis RD, David AJ, Del Rosario CJ, Dizon AP, Fernandez JL, et al. Stigma burden as a predictor of suicidal behavior among lesbians and gays in the Philippines. *Suicidol Online*. (2017) 8:1–0.

20. Reyes MES, Davis RD, Dacanay PML, Antonio ASB, Beltran JSR, Chuang MD, Leoncito ALI. The presence of self-stigma, perceived stress, and suicidal ideation among selected LGBT Filipinos. *Psychol Stud*. (2017) 62:284–90. doi: 10.1007/s12646-017-0422-x

21. Tan KK, Saw AT. Prevalence and correlates of mental health difficulties amongst LGBTQ people in Southeast Asia: a systematic review. *J Gay Lesbian Ment Health*. (2022) 11:1–20. doi: 10.1080/19359705.2022.2089427

22. Official Gazette. *Republic Act No. 11036*. Official Gazette (2018). Available online at: https://www.officialgazette.gov.ph/2018/06/20/republic-act-no-11036/ (accessed May 31, 2022).

23. Pangilinan F. *An Act Prohibiting Discrimination on the Basis of Sexual Orientation and Gender Identity or Expression (SOGIE) and Providing Penalties Therefore*. (2019). Available online at: https://legacy.senate.gov.ph/lisdata/3106627964!.pdf (accessed February 28, 2023).

24. The Lancet Psychiatry. When therapy is not therapy. *Lancet Psychiatry*. (2022) 9:261. doi: 10.1016/S2215-0366(22)00076-1

25. Li G, Qin S, Lu H, Santtila P, Hall BJ. Eliminating conversion therapy and promoting LGBTQ-affirmative therapy in China. *Lancet Psychiatry*. (2022) 9:e25. doi: 10.1016/S2215-0366(22)00120-1

26. Trispiotis I, Purshouse C. 'Conversion therapy' as degrading treatment. *Oxf J Leg Stud*. (2021) 42:104–32. doi: 10.1093/ojls/gqab024

27. Adelson S, Miller AM, Johnson K, Reid G. What psychiatry can do to end LGBT conversion therapy. *Lancet Psychiatry*. (2022) 9:e40. doi: 10.1016/S2215-0366(22)00235-8

28. Hinrichs KLM, Donaldson W. Recommendations for use of affirmative psychotherapy with LGBT older adults. *J Clin Psychol*. (2017) 73:945–53. doi: 10.1002/jclp.22505

29. Craig SL, Eaton AD, Leung VWY, Iacono G, Pang N, Dillon F, et al. Efficacy of affirmative cognitive behavioural group therapy for sexual and gender minority adolescents and young adults in community settings in Ontario, Canada. *BMC Psychol*. (2021) 9:94. doi: 10.1186/s40359-021-00595-6

30. Proujansky RA, Pachankis JE. Toward formulating evidence-based principles of LGB-affirmative psychotherapy. *Pragmat Case Stud Psychother*. (2014) 10:117–31. doi: 10.14713/pcsp.v10i2.1854

31. Chen D, Berona J, Chan YM, Ehrensaft D, Garofalo R, Hidalgo MA, et al. Psychosocial functioning in transgender youth after 2 years of hormones. *N Engl J Med*. (2023) 388:240–50. doi: 10.1056/NEJMoa2206297

frontiers | Frontiers in Psychiatry

TYPE Original Research
PUBLISHED 20 July 2023
DOI 10.3389/fpsyt.2023.1195298

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Bokolo Anthony Jnr.,
Institute for Energy Technology, Norway
Raphael Zozimus Sangeda,
Muhimbili University of Health and Allied Sciences, Tanzania

*CORRESPONDENCE
Yuan Shen
✉ shenyuan8606@163.com
Haohao Zhu
✉ zhuhh@jiangnan.edu.cn

†These authors have contributed equally to this work

RECEIVED 28 March 2023
ACCEPTED 30 June 2023
PUBLISHED 20 July 2023

CITATION
Du Z, Jiang Y, Lu R, Zhou Q, Pan Y, Shen Y and Zhu H (2023) Practice of pharmaceutical services and prescription analysis in internet-based psychiatric hospitals during COVID-19 pandemic in Wuxi, China.
Front. Psychiatry 14:1195298.
doi: 10.3389/fpsyt.2023.1195298

Practice of pharmaceutical services and prescription analysis in internet-based psychiatric hospitals during COVID-19 pandemic in Wuxi, China

Zhiqiang Du†, Ying Jiang†, Rongrong Lu, Qin Zhou, Yiting Pan, Yuan Shen* and Haohao Zhu*

Mental Health Center of Jiangnan University, Wuxi Central Rehabilitation Hospital, Wuxi, Jiangsu, China

Objective: To study the practice of pharmaceutical services in internet-based psychiatric hospitals, and to analyze the prescriptions to ensure the safety and efficacy of internet-based medication in Wuxi, China.

Methods: All 1,259 internet-based prescriptions from our hospital in 2022 were collected, and data on patients' age, gender, diagnosis, medications used, medication types, dosage forms, rationality of medication use, and reasons for irrationality were analyzed through descriptive statistics.

Results: In the electronic prescriptions of internet-based psychiatric hospitals, females accounted for the majority (64.50%), with a female-to-male ratio of 1.82:1. Middle-aged and young adults accounted for the majority of patients (57.50%). There were 47 diagnosed diseases involved, with 89 types of medications used and 1,938prescriptions issued. Among them, there were 78 types of western medicine with 1,876 prescriptions (96.80%), and 11 types of traditional Chinese medicine with 62 prescriptions (3.20%). The main medications used were anti-anxiety and antidepressant medications (44.94%) and psychiatric medications (42.21%). The dosage forms were all oral, with tablets (78.53%), capsules (17.54%), and solution preparations (2.17%) being the top three in frequency. According to the prescription review results, the initial pass rate of internet-based system review was 64.26%. After intervention by the internet-based system and manual review by pharmacist reviewers, the final pass rate of internet-based prescriptions reached 99.76%.

Conclusion: The practice of pharmaceutical services and prescription analysis in internet-based psychiatric hospitals could significantly improve medication rationality, which fills the research gap in this field. In addition, it promotes the transformation of pharmaceutical service models.

KEYWORDS

psychiatric hospital, internet, pharmaceutical services, prescription analysis, pandemic

1. Introduction

During the pandemic period of COVID-19, hospitals are both the first line of defense in pandemic prevention and control and a high-risk place for the spread of the pandemic (1–3). For patients with chronic mental illness, there is not only the risk of infection but also the difficulty of obtaining medication from hospitals, and even the danger of discontinuing medication (4, 5). According to the Notice on Strengthening the Treatment and Management of Severe Mental Disorders During the COVID-19 Pandemic issued by the National Health Commission of China (6), 323 cases of severe mental disorders have been diagnosed with COVID-19, and 43 cases were suspected of having COVID-19, involving 17 provinces across the country. Due to the high degree of specialization, most psychiatric hospitals are not equipped with internal medicine. Currently, COVID-19 related research mainly focuses on general hospitals, and there is less research on psychiatric pandemics.

To reduce the risk of crowd gathering and cross-infection in hospitals during the pandemic period, and to meet the needs of patients for safe, timely, and convenient access to medication, electronic medical systems have been introduced through several approaches. Anthony Jnr emphasized the important of telehealth based on a technological organizational environment framework in public health emergencies (7). Other studies also confirmed that the telemedicine and eHealth could protect both medical practitioners and patients, reduce the spread of COVID-19 (8, 9). Telepsychiatry has also proven as a promising way to improve the mental health assistance, however, it has not been underused (10).

The National Health Commission of China issued a notice requiring medical institutions nationwide to fully leverage the unique advantages of "Internet + medical care" to improve online drug supply guarantee services (11), that is, after the pharmacist reviews the common and chronic disease prescriptions issued online, medical institutions and drug business enterprises can entrust qualified third-party institutions for delivery, expand the space for online medical services, and alleviate the spread of the pandemic. During the pandemic, our hospital (Mental Health Center of Jiangnan University) responded actively, and opened a trial run of the online outpatient department of the psychiatric hospital on October 10, 2021, which was officially launched on January 1, 2022. This study provided an in-depth analysis of the pharmacy service practice and outpatient prescription situation of the internet hospital to improve the quality of pharmacy services in psychiatric internet hospitals, standardize the operation of internet hospitals during the pandemic.

2. Materials and methods

During the pandemic, the Internet hospital was established, and the internet electronic prescription could be obtained online. Through a retrospective analysis of the hospital information system, all 1,259 electronic outpatient prescriptions in 2022 were retrieved from the internet hospital of the psychiatric hospital in Wuxi, China. According to the prescription content, patients' age, gender, online consultation disease category, prescription medication name, type, dosage form, and other information were recorded in an Excel table, and statistical analysis was conducted on the prescription situation, distribution of diseases, medications used by patients, type, dosage form, rationality of medication use, and reasons for irrationality. The evaluation of prescription medication use rationality was based on the "Prescription Management Measures" (original Ministry of Health document No. 53), the "Hospital Prescription Evaluation Management Norms (Trial)" (Health and Medical Administration Letter [2010] No. 28), drug instructions, published domestic and foreign literature, and published books, etc.

Descriptive statistics were used. Data was inputted to EpiData 3.1 software and statistical analyzed through SPSS 20.0. The counting data was described as the number of cases (composition ratio), and the measurement data was described by $\bar{x} \pm s$.

3. Results

3.1. Basic information of electronic prescriptions

A total of 1,259 electronic prescriptions were collected, of which 812 cases (64.50%) were females, and 447 cases (35.50%) were males. The ratio of females to males was 1.82:1. Young adults aged 18–39 accounted for the largest proportion of patients, with 724 cases (57.50%). According to the "Hospital Prescription Review Management Specification," the number of drug varieties contained in per prescription generally complied with the regulations. One drug was prescribed in the majority of cases, with 702 prescriptions (55.76%). Refer to Table 1.

3.2. Distribution of diseases

All the electronic prescriptions issued by our internet-based psychiatric hospital were psychiatric-related disorders and for follow-up treatments of non-emergency cases. Of the 1,259 electronic prescriptions, a total of 47 diseases were involved, and the top three diseases were anxiety depression (17.00%), anxiety disorder (14.38%) and depressive episode (10.88%) (Table 2).

TABLE 1 Basic situation of electronic prescriptions in the internet-based psychiatric hospital.

Basic information		Number of internet prescriptions	Proportion (%)
Gender	Female	812	64.50
	Male	447	35.50
Age	7–17	209	16.60
	18–39	724	57.50
	40–59	231	18.35
	≥60	95	7.55
Number of drug varieties per prescription (types)	1	702	55.76
	2	453	35.98
	3	89	7.07
	4	12	0.95
	5	3	0.24

TABLE 2 Distribution of the top 10 diseases.

Diseases	Number of internet prescriptions	Proportion (%)
Anxiety depression	214	17.00
Anxiety disorder	181	14.38
Depressive episode	137	10.88
Schizophrenia	136	10.80
Recurrent depressive disorder	65	5.16
Bipolar disorder	65	5.16
Mood disorder	57	4.53
Childhood emotional disorder	53	4.21
Obsessive–compulsive disorder	52	4.13
Nervous exhaustion	40	3.18

3.3. Frequency ranking of drug prescriptions

Of the 1,259 electronic prescriptions investigated in the internet-based psychiatric hospital, 89medications were involved, and the medications were not listed as narcotics, Class I or II psychotropic medications, high-risk or high-alert medications under special management by the government. The top 10 medications in terms of prescription frequency were quetiapine fumarate tablets (9.39%), escitalopram oxalate tablets (8.10%), olanzapine tablets (7.59%), duloxetine hydrochloride delayed-release capsules (7.33%), venlafaxine hydrochloride sustained-release capsules (4.64%), mirtazapine tablets (4.33%), fluvoxamine maleate tablets (4.23%), aripiprazole tablets (4.18%), sertraline hydrochloride tablets (4.08%), and agomelatine tablets (3.46%) (Table 3).

3.4. Distribution of medication types

In the medication variety of electronic prescriptions issued by internet-based mental health hospitals surveyed in this study, a total of 78 Western medicines were involved with a prescription frequency of 1876 times (96.80%), and 11 traditional Chinese medicines were involved with a prescription frequency of 62 times (3.20%). Mainly, anti-anxiety and antidepressant medications accounted for 871 (44.94%), and psychotropic medications accounted for 818 (42.21%), as shown in Table 4.

3.5. Distribution of medication dosage forms

The medication formulations prescribed by the online psychiatric hospital were all oral formulations, with tablets accounting for the top three at 1522 times (78.53%), followed by capsules at 340 times (17.54%), and liquid formulations at 42 times (2.17%) (Table 5).

TABLE 3 The top 10 medications in terms of frequency of electronic prescription.

Medications	Frequency	Proportion (%)
Quetiapine Fumarate tablets	182	9.39
Escitalopram Oxalate tablets	157	8.10
Olanzapine tablets	147	7.59
Duloxetine Hydrochloride Gastro-resistant capsules	142	7.33
Venlafaxine Hydrochloride Sustained-release capsules	90	4.64
Mirtazapine tablets	84	4.33
Fluvoxamine Maleate tablets	82	4.23
Alprazolam tablets	81	4.18
Sertraline Hydrochloride tablets	79	4.08
Agomelatine tablets	67	3.46

3.6. Analysis of irrational medication use

Among the 1,259 electronic prescriptions issued, 450 (35.74%) were judged to be irrational by the internet system. The types of irrational medication use included 254 cases (20.17%) of overindication, 130 cases (10.33%) of special population medication problems, 60 cases (4.77%) of drug interactions, and 6 cases (0.48%) of inappropriate dosage and administration. After initial review by the internet prescription review system and pharmacist intervention, and confirmation by the doctor's signature, a total of 3 internet prescriptions were deemed irrational after final review by the pharmacist, accounting for 0.24% of the total prescriptions. The main problems were drug interactions in 2 cases (0.16%) and overindication in 1 case (0.08%) (Table 6).

4. Discussion

This study found that during the pandemic in Wuxi, China, female patients accounted for the majority (64.50%) of electronic prescriptions in the online psychiatric hospital, with a female-to-male ratio of 1.82:1. Previous studies have shown that women were more likely than men to experience negative emotions (12, 13) and have a significantly higher proportion of mental illnesses such as depression, recurrent depressive disorders, and anxiety disorders (14). This study found that young adults aged 18–39 were the main age group of patients (57.50%). Previous research has shown that the number of cases of mental depression in young adults was the highest (15, 16), and young adults consult online more frequently than older people and find it more convenient. According to the "Hospital Prescription Review and Management Standards," the number of medication types prescribed in electronic prescriptions for psychiatric hospitals in this study generally complied with regulations, with one medication type accounting for the majority (55.76%).

TABLE 4 Distribution of medication types.

Types	Frequency	Proportion (%)
Western medicines	1876	96.80
Anti-anxiety and antidepressant medications	871	44.94
Psychotropic medications	818	42.21
Antiepileptic medications	104	5.37
Anti-dementia medications	21	1.08
Antiplatelet medications	12	0.62
Vasodilator medications	9	0.46
Anticholinergic medications	9	0.46
Laxatives	7	0.36
Anti-anemia medications	5	0.26
Antidiabetic medications	5	0.26
Antihypertensive medications	4	0.21
Vitamins	3	0.15
Hepatoprotective medications	3	0.15
Cardiovascular medications	2	0.10
Antibacterial medications	2	0.10
Thyroid hormone medications	1	0.05
Chinese medicines	62	3.20
Tranquillization and sleep-promoting	55	2.84
Blood-nourishing and qi-regulating	3	0.15
Promoting blood circulation and removing blood stasis	3	0.15
Liver-clearing and gallbladder-benefiting	1	0.05

TABLE 5 Distribution of medication dosage forms.

Dosage forms	Frequency	Proportion (%)
Tablets	1,522	78.53
Capsules	340	17.54
Liquid formulations	42	2.17
Granules	26	1.34
Suppositories	7	0.36
Pills	1	0.05
Total	1938	100.00

Our online psychiatric hospital mainly provides follow-up and chronic disease prescription services for non-emergency or non-first-time patients with mental illnesses. This study found that our hospital's electronic prescriptions covered a total of 47 types of diseases, with the top three being anxiety depression (17.00%), anxiety disorders (14.38%), and depressive episodes (10.88%). Previous studies have shown that sudden public health emergencies can lead to changes in social and economic conditions and lifestyle, which can lead to varying degrees of psychological problems such as depression and anxiety (17–19). During the COVID-19 pandemic, measures such as work stoppages, school closures, and quarantine of residential areas were taken to control the spread of the virus. Due to medical isolation or home quarantine, the daily routines were disrupted, and they were worried about the impact on work or family during isolation or illness, leading to significant psychological pressure and obvious depression and anxiety (19). Patients with mental illnesses are more susceptible to illness, and online psychiatric hospitals can help reduce the risk of cross-infection from offline consultations, facilitate consultations and medication management, and provide medication guidance.

The medication catalog should meet the common diseases and chronic disease treatment needs of online psychiatric hospitals. Medications with high individualized risk and requiring personalized medication guidance should not be included in the catalog (20). This study surveyed a total of 1,259 electronic prescriptions in the online psychiatric hospital, involving 89 types of medications with a prescription frequency of 1,938 times. Among them, there were 78 types of Western medicine with a prescription frequency of 1,876 times (96.80%), and 11 types of traditional Chinese medicine with a prescription frequency of 62 times (3.20%). The prescriptions did not involve narcotic medications, Class I and Class II psychotropic medications, and high-risk or high-danger medications that are subject to special management regulations by the government. The majority of these medications are anti-anxiety and anti-depressant medications (44.94%) and psychiatric medications (42.21%), which indicated the influence of COVID-19 on the mental health (18, 19).

This study found that all the psychiatric medications prescribed by internet-based hospitals were oral medications. As a psychiatric hospital, the medications used in outpatient services are mainly oral psychiatric medications, with a low use of injectable medications. Additionally, medications with high distribution requirements, such as injectable medications and cold chain storage medications, have not yet been included in the online medication delivery catalog and are currently only available for patients to obtain at the hospital.

This study found that the initial qualification rate of prescriptions reviewed by the Internet system was 64.26%, but after the Internet system intervened and the reviewing pharmacist conducted manual review, the final qualification rate of the internet prescription reached 99.76%. The types of unreasonable medication use mainly determined by the initial review of our Internet system include off-label use (20.17%) and special population medication use issues (10.33%). For the off-label use of medications, special population medication use, medication interactions, improper use and dosage, etc. in the Internet psychiatric hospital, corresponding measures can be taken to establish a feasible Internet electronic prescription review system, strictly follow the relevant regulations, and ensure the accuracy and effectiveness of each electronic prescription. During the process of issuing electronic

TABLE 6 Irrational medication use situation.

Types	Judged by internet system	Proportion (%)	Judged by pharmacist	Proportion (%)
Overindication	254	20.17	1	0.08
Special populations	130	10.33	0	0.00
Drug interaction	60	4.77	2	0.16
Inappropriate dosage and administration	6	0.48	0	0.00
Total	450	35.74	3	0.24

prescriptions, the Internet prescription review system should be continuously updated and maintained (21, 22). If there are issues such as off-label use, medication dosage, medications not suitable for the symptoms, or drug interactions, an alert should be issued to reduce the occurrence of unreasonable prescriptions (23–25).

Although the study pointed the importance of internet hospital during the pandemic, the study was a single-center study, the sample size was small and the types of involved medication was limited. Therefore, the model needs to be continuously improving, in order to enhance its clinical applicability.

5. Conclusion

The internet psychiatric hospital has changed the traditional medical process for patients during the pandemic period, which could significantly improve medication rationality. This study analyzed the pharmacy services and electronic prescription situation of the online psychiatric hospital during the pandemic, as well as the application characteristics of medication varieties, types, dosage forms, and usage, which filled the gap in domestic and foreign research, providing reference for further studies. On the other hand, it can improve the quality of pharmacy services in the online psychiatric hospital. Meanwhile, follow-up pharmacy services can be extended to include online follow-up visits and monitoring of adverse drug reactions by clinical pharmacists for patients who receive medication online. Especially during this special period of nationwide unity and overcoming difficulties, pharmaceutical personnel should integrate pharmacy services with new technologies and concepts on the Internet while taking proper protective measures, actively promoting the transformation of pharmacy service models, providing new ideas for pharmaceutical workers in the fight against the pandemic, and contributing to the overall victory of the pandemic prevention and control.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Ethics statement

The studies involving human participants were reviewed and approved by Wuxi Mental Health Center. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

ZD and HZ conceived the study. ZD, YJ, RL, YP, and QZ collected the report. YJ and ZD wrote the manuscript. YS and HZ edited the manuscript. All authors contributed to the article and approved the submitted version.

Funding

The work is supported by the National Natural Science Foundation of China (no. 82104244), Wuxi Municipal Health Commission (no. Q202101 and ZH202110), Wuxi Taihu Talent Project (no. WXTTP2020008 and WXTTP2021), Wuxi Medical Development Discipline Project (no. FZXK2021012), and Jiangsu Research Hospital Association for Precision Medication (JY202105).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

1. Li S, Guo B, Yang Q, Yin J, Jiang Y, Tian L, et al. Factors associated with depression in residents in the post-epidemic era. *QJM*. (2022) 115:605–9. doi: 10.1093/qjmed/hcac181

2. Jiang Y, Lu R, Ou M, Zhou Q, du Z, Zhu H. Application of "Internet+" pharmaceutical consultation services in psychiatric hospital during the epidemic. *Asian J Psychiatr*. (2023) 82:103532. doi: 10.1016/j.ajp.2023.103532

3. Li S, Guo B, Lu X, Yang Q, Zhu H, Ji Y, et al. Investigation of mental health literacy and status of residents during the re-outbreak of COVID-19 in China. *Front Public Health*. (2022) 10:895553. doi: 10.3389/fpubh.2022.895553

4. Druss BG. Addressing the COVID-19 pandemic in populations with serious mental illness. *JAMA Psychiat*. (2020) 77:891–2. doi: 10.1001/jamapsychiatry.2020.0894

5. de Hert M, Mazereel V, Detraux J, van Assche K. Prioritizing COVID-19 vaccination for people with severe mental illness. *World Psychiatry*. (2021) 20:54–5. doi: 10.1002/wps.20826

6. Disease Control Bureau of the National Health Commission. Notice on strengthening the treatment and management of severe mental disorders during the COVID-19 epidemic [EB/OL]. (2020). Available at: http://www.nhc.gov.cn/kj/s3577/202002/f315a6bb2955474c8ca0b33b0c356a32.shtml

7. Anthony JB. Examining the adoption of telehealth during public health emergencies based on technology organization environment framework. *J Sci Technol Policy Manag*. (2023). doi: 10.1108/JSTPM-05-2022-0079 [Epub ahead of print].

8. Bokolo AJ. Application of telemedicine and eHealth technology for clinical services in response to COVID-19 pandemic. *Heal Technol*. (2021) 11:359–66. doi: 10.1007/s12553-020-00516-4

9. Li H, Zheng S, Li D, Jiang D, Liu F, Guo W, et al. The establishment and practice of pharmacy care service based on Internet social media: telemedicine in response to the COVID-19 pandemic. *Front Pharmacol*. (2021) 12:707442. doi: 10.3389/fphar.2021.707442

10. di Carlo F, Sociali A, Picutti E, Pettorruso M, Vellante F, Verrastro V, et al. Telepsychiatry and other cutting-edge technologies in COVID-19 pandemic: Bridging the distance in mental health assistance. *Int J Clin Pract*. (2021) 75. doi: 10.1111/ijcp.13716

11. General Office of the State Council. Opinions on promoting the development of "Internet Plus Medical and Health" [EB/OL]. (2020). Available at: http://www.gov.cn/zhengce/content/201804/28/content_5286645.htm

12. Rossell SL, Neill E, Phillipou A, Tan EJ, Toh WL, van Rheenen TE, et al. An overview of current mental health in the general population of Australia during the COVID-19 pandemic: Results from the COLLATE project. *Psychiatry Res*. (2021) 296:113660. doi: 10.1016/j.psychres.2020.113660

13. Min C, Shen F, Yu W, Chu Y. The relationship between government trust and preventive behaviors during the COVID-19 pandemic in China: Exploring the roles of knowledge and negative emotion. *Prev Med*. (2020) 141:106288. doi: 10.1016/j.ypmed.2020.106288

14. Duan L, Shao X, Wang Y, Huang Y, Miao J, Yang X, et al. An investigation of mental health status of children and adolescents in china during the outbreak of COVID-19. *J Affect Disord*. (2020) 275:112–8. doi: 10.1016/j.jad.2020.06.029

15. Lee CM, Cadigan JM, Rhew IC. Increases in loneliness among young adults during the COVID-19 pandemic and association with increases in mental health problems. *J Adolesc Health*. (2020) 67:714–7. doi: 10.1016/j.jadohealth.2020.08.009

16. Nagata JM, Palar K, Gooding HC, Garber AK, Whittle HJ, Bibbins-Domingo K, et al. Food insecurity is associated with poorer mental health and sleep outcomes in young adults. *J Adolesc Health*. (2019) 65:805–11. doi: 10.1016/j.jadohealth.2019.08.010

17. Søvold LE, Naslund JA, Kousoulis AA, Saxena S, Qoronfleh MW, Grobler C, et al. Prioritizing the mental health and well-being of healthcare workers: an urgent global public health priority. *Front Public Health*. (2021) 9:679397. doi: 10.3389/fpubh.2021.679397

18. Mukhtar S. Mental health and psychosocial aspects of coronavirus outbreak in Pakistan: psychological intervention for public mental health crisis. *Asian J Psychiatr*. (2020) 51:102069. doi: 10.1016/j.ajp.2020.102069

19. Cai W, Lian B, Song X, Hou T, Deng G, Li H. A cross-sectional study on mental health among health care workers during the outbreak of Corona Virus Disease 2019[J]. *Asian J Psychiatr*. (2020) 51:102111. doi: 10.1016/j.ajp.2020.102111

20. Guangdong Pharmaceutical Association. Expert consensus on standardized management of prescription circulation platform for internet hospitals. *Today's Pharmacy*. (2020) 30:721–7.

21. Monteiro L, Maricoto T, Solha I, Ribeiro-Vaz I, Martins C, Monteiro-Soares M. Reducing potentially inappropriate prescriptions for older patients using computerized decision support tools: systematic review. *J Med Internet Res*. (2019) 21:e15385. doi: 10.2196/15385

22. Wang X, Xuan Z, Storella TH, Zhou X. Determinants of non-prescription antibiotic dispensing in Chinese community pharmacies from socio-ecological and health system perspectives. *Soc Sci Med*. (2020) 256:113035. doi: 10.1016/j.socscimed.2020.113035

23. Du Z, Jiang Y, Shen Y, et al. Reevaluation of adverse drug reactions of psychiatric drugs under the chinese drug volume-based procurement policy. *BMC Health Serv Res*. (2022) 22:1–6. doi: 10.1186/s12913-022-07851-4

24. Yang Y, Chen L, Ke X, Mao Z, Zheng B. The impacts of Chinese drug volume-based procurement policy on the use of policy-related antibiotic drugs in Shenzhen, 2018–2019: an interrupted time-series analysis. *BMC Health Serv Res*. (2021) 21:1–10. doi: 10.1186/s12913-021-06698-5

25. Chen Y, Ji X, Xiao H, Unger JM, Cai Y, Mao Z, et al. Impact of the pilot volume-based drug purchasing policy in China: Interrupted time-series analysis with controls. *Front Pharmacol*. (2021) 12:3715. doi: 10.3389/fphar.2021.804237

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 21 September 2023
DOI 10.3389/fpubh.2023.1277341

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Shadrack Muma,
University of KwaZulu-Natal, South Africa
Aneta Grochowska,
University of Applied Sciences in Tarnow, Poland

*CORRESPONDENCE
Nikki Heinze
✉ Nikki.heinze@bravovictor.org

RECEIVED 14 August 2023
ACCEPTED 08 September 2023
PUBLISHED 21 September 2023

CITATION
Heinze N and Castle CL (2023) Exploring mental well-being, the emotional impact of visual impairment and experiences of prejudice and discrimination among adults from minority ethnic communities in the UK.
Front. Public Health 11:1277341.
doi: 10.3389/fpubh.2023.1277341

Exploring mental well-being, the emotional impact of visual impairment and experiences of prejudice and discrimination among adults from minority ethnic communities in the UK

Nikki Heinze[1]* and Claire L. Castle[1,2]

[1]BRAVO VICTOR, London, United Kingdom, [2]School of Music, Faculty of Arts, Humanities and Cultures, University of Leeds, Leeds, United Kingdom

Background: Visual impairment (V.I.) has been associated with a negative impact on mental health outcomes, including a process of grief among those who lose their sight. Older adults with V.I. who had experienced discrimination have been found to be at increased risk of depression, loneliness, poorer life satisfaction and poorer quality of life. Adults from minority ethnic communities (MEC) may be at increased risk of V.I. and yet, research on the experiences of MEC adults with V.I. remains limited. This article forms part of a series which explores issues and status among MEC adults living with V.I. in the UK.

Methods: A secondary analysis of V.I. Lives survey data was performed to explore mental well-being assessed by the short Warwick-Edinburgh Mental Well-being scale (SWEMWBS), the emotional impact of V.I., and prejudice and discrimination among a matched control sample of 77 MEC and 77 adults from white communities (WC). Participants were matched by age, gender, UK region and urban/rural setting. Subgroup analyses were also conducted for the two largest MEC subgroups, Asian ($n = 46$) and black participants ($n = 22$).

Results: There were few statistically significant differences between the groups. MEC participants were significantly more likely than WC participants to rate emotional support to come to terms with their V.I. as important and to feel optimistic about their V.I. but they were significantly less likely to agree that they were receiving the level of emotional support they needed to get on with their life. Within the MEC group, participants from Asian communities had significantly poorer mental well-being, and they were also significantly more likely to agree that the general public were often prejudiced against people with V.I. and less likely to feel optimistic about their V.I. than black participants.

Conclusion: Although there were few statistically significant differences, participants from Asian communities were more likely to report poor mental and emotional well-being, and experiences of discrimination, than black and white participants. In contrast, participants from black communities fared the same as, or in some cases better than, white participants. Future research will need to confirm these findings and explore reasons for these.

KEYWORDS

visual impairment, sight loss, minority ethnic, BamE, mental well-being, prejudice, discrimination, social inequalities

1. Introduction

There are an estimated 2 million people living with visual impairment (V.I.) in the UK and this number is estimated to increase to approximately 4 million by 2050 (1). Adults from minority ethnic communities (MEC) have been found to be at increased risk of V.I. (2, 3) and certain eye conditions, which can lead to V.I. While prevalence of V.I. is estimated to increase in all ethnic groups, MEC adults are projected to make up an increasing proportion of adults living with V.I. in the UK (4). Yet, a rapid review of academic and grey literature published since 2005 identified substantial gaps in the evidence relating to their experiences, including experiences of prejudice and discrimination, mental well-being and the emotional impact of V.I. (5).

Across various populations, V.I. has been associated with poorer quality of life and mental health outcomes, including depression and anxiety (3, 6–12), although this may be poorer in individuals with acquired than congenital V.I. (13). Analysis of data from two large-scale UK surveys, found poorer mental well-being as assessed by the short version of the Warwick-Edinburgh Mental Well-being scale (SWEMWBS) among adults with V.I. ($M = 22.70$) compared to adults with other impairments ($M = 24.17$) and those with no impairments ($M = 25.86$) after controlling for age and sex (14). One reason for this may relate to the impact of V.I. on a wide range of areas of life including activities of daily living (15, 16), employment outcomes (3, 17), and sporting and leisure activities (18, 19). Another reason may be negative public attitudes towards people living with V.I., resulting in discrimination. Indeed, negative public attitudes arising from a lack of awareness of V.I. and its impact are perceived to be the biggest barrier to participation in everyday life by people living with V.I. (20). A UK survey of 1,223 blind and partially sighted adults found that 35% had experienced negative public attitudes in the last 12 months due to their V.I., with younger respondents and those registered as severely sight impaired or blind being more likely to report negative attitudes and unfair treatment (21). Data from the English Longitudinal Study of Ageing showed that older adults with poor eyesight who had experienced discrimination were at increased risk of depression, loneliness, poorer life satisfaction and poorer quality of life than those who had not experienced discrimination. Furthermore, older adults with poor eyesight were more likely to have experienced discrimination than those with good eyesight (22).

Whilst underexplored, MEC adults with V.I. may experience additional challenges relating to mental health, with evidence of mental health inequalities among MEC adults in the UK, both in terms of diagnoses of mental health conditions and experiences of support services (23, 24). This could reflect experiences of stigma and discrimination amongst MEC adults with V.I. arising from negative attitudes in the general population as well as those held by their own communities A small number of articles and reports provide some insights into the attitudes of individual ethnic communities of those living with V.I., and of V.I. itself (25–27), but there is no evidence relating to public attitudes and experiences of mental well-being among MEC adults in the UK. The purpose of this article is to provide preliminary insights into the emotional impact of V.I., mental well-being, and experiences of prejudice and discrimination among a sample of MEC adults living with V.I. in the UK, and to compare these to the experiences of adults from white communities (WC). It forms part of a series of articles which explore the wider experiences of MEC adults who have V.I.

Abbreviations: UK, United Kingdom; MEC, minority ethnic communities; WC, white communities; V.I., visual impairment; SWEMWBS, short version of the Warwick-Edinburgh Mental Well-being scale.

2. Materials and methods

This article presents findings from a secondary analysis of data collected in the V.I. Lives survey. The methods of data collection and sample selection are described in more detail elsewhere (28, 29). Briefly, V.I. Lives was a UK telephone survey of people with V.I. commissioned by the Royal National Institute of the Blind (RNIB), the Thomas Pocklington Trust (TPT) and Guide Dogs for the Blind Association (Guide Dogs) and conducted by the market research agency Insight Angels and the fieldwork agency Acumen Fieldwork. Participants were recruited through the Acumen healthcare database, local and national charities, social media, and radio adverts. Non-English speakers and those without V.I. were screened out in an initial call. Data was collected in two waves, from 17 December 2019 to 23 March 2020 and from 14 August 2020 to 2 November 2020.

2.1. Materials

The survey explored a wide range of topics including health and well-being, functioning and accessibility, social relationships, and emotional well-being. At the end of the questionnaire participants were asked to rate the extent to which a list of issues was important to their quality of life. The list included an item on public attitudes and emotional support to come to terms with their V.I. Items were rated on a scale ranging from *extremely important* to *not important at all*.

V.I. was assessed using participants' self-reported registration status or level of near, distance and peripheral functional vision.

Mental well-being was assessed using the short version of the Warwick-Edinburgh Mental Well-being scale (SWEMWBS) (30). SWEMWBS consists of seven positively worded items which assess thoughts and feelings, and focuses on functioning. Responses are given on a 5-point scale ranging from 1 – *None of the time* to 5 – *All of the time*. The scale is scored by summing the scores for individual items. The total raw scores are transformed into metric scores using a conversion table provided by the scale owners. Higher scores are indicative of better mental well-being. Cronbach's alpha for this scale was 0.860, suggesting good internal consistency.

Emotional impact of V.I. was assessed by several questions. First, participants were presented with a list of 5 positive (e.g., happy and confident) and 9 negative emotions (e.g., ashamed and angry) and asked to select all that described how they felt in relation to their sight condition. Second, participants were asked to state to what extent they agreed or disagreed with a list of statements exploring their attitudes to different aspects of life on a 5-point scale ranging from *Strongly agree* to *Strongly disagree*. Five statements explored the emotional impact of V.I. (*I feel anxious about the future*, *I am struggling to come to terms with being visually impaired*, *I am able to talk to others about my vision impairment without getting upset*, *I'm often worried about what people think of me*, and *I frequently think about my vision impairment and the impact it has on my life*). One item explored the extent to which people had integrated their V.I. into their identity (*I*

am who I am and my V.I. is part of me) and two assessed prejudice and discrimination (*I've experienced negative attitudes or discrimination due to my sight impairment* and *The general public are often prejudiced against people with sight impairment*).

2.2. Participants

A total of 769 participants aged 13 and over completed the survey. This secondary analysis focuses on adult participants aged 18 and over. In order to explore group differences based on ethnicity, a matched control sample was drawn using R (31). WC participants were matched to MEC participants based on their age, gender, region where they lived and whether they lived in rural areas vs. towns. One participant who did not define as male or female was excluded due to the potential for intersectionality and the lack of a match being available in the other group. The matched sample consisted of 77 MEC and 77 WC participants. The MEC group consisted of participants who identified as Asian/Asian British, Black/African/Caribbean/Black British, Mixed/multiple ethnic groups and Other ethnic group. The WC group consisted of adults who identified as White British and White other.

2.3. Data analysis

Data analysis was performed in IBM SPSS (32). First, descriptive statistics were produced to provide an overview of experiences within each group. Although the V.I. Lives survey was not specifically designed to explore ethnic group differences and subsample sizes for individual ethnic groups were low, subgroup analysis consisted of comparing MEC to WC participants and comparing the two MEC subgroups with the largest sample sizes, Asian ($n = 46$) and black ($n = 22$) participants. Sample sizes for all other MEC subgroups were too small to enable meaningful comparison. Response distributions were calculated as counts and proportions for each variable. Categorical variables were analysed using chi-square test. Where assumptions of cell counts were violated, Fisher's exact test were performed in R. Ordinal variables were analysed using Mann–Whitney *U* tests. Age and the SWEMWBS score were treated as continuous variables and the mean and standard deviation for each group were calculated. Age was not normally distributed for MEC ($p = 0.001$), WC ($p = 0.002$) and Asian participants ($p = 0.014$), and the SWEMWBS scores were not normally distributed for MEC ($p = 0.017$) and WC ($p = 0.045$) participants, as assessed by Shapiro–Wilk's test. Non-parametric Mann–Whitney *U* tests were used to assess group differences instead of t-tests. Findings relating to priority issues (29), education, employment and finances (33), health and comorbidity (34), functioning and accessibility (35), social functioning (36), and access and use of services (37) relating to this sample are presented elsewhere.

3. Results

Table 1 provides an overview of the characteristics of the 77 MEC, 77 WC, 46 Asian and 22 black participants. There were no statistically significant differences between MEC and WC participants, nor between Asian and black participants. Mean age was similar between WC ($M = 41.09$, SD = 15.62), MEC ($M = 40.78$, SD = 15.58), Asian ($M = 40.17$, SD = 14.61) and black ($M = 39.18$, SD = 14.70) participants. A majority across all groups were female, single, employed, residing in England, in big towns or cities, specifically in London, educated to degree level and categorised as having severe V.I. In contrast, a majority of black participants were educated to Master's/PhD level and categorised as having moderate V.I.

3.1. Mental well-being and the emotional impact of V.I.

Table 2 shows prevalence of a range of positive and negative feelings participants had about their V.I. Table 3 gives response distributions for variables relating to the emotional impact of V.I. There was no statistically significant difference between MEC ($M = 23.29$, SD = 4.66) and WC participants ($M = 23.58$, SD = 4.81) in mental well-being as assessed by SWEMWBS, $U = 2{,}773$, $p = 0.671$. But within the MEC group, participants from black communities ($M = 25.79$, SD = 4.08) scored significantly higher on the SWEMWBS than participants from Asian communities ($M = 22.37$, SD = 4.21), $t(66) = -3.170$, $p = 0.002$ (Figure 1).

Black participants were also generally more likely to feel positive about their V.I. and less likely to feel negative about their V.I. than participants from Asian communities, although a statistically significant difference was found only for optimism, X^2 (1, 68) = 4.53, $p = 0.033$, Cramer's V = 0.258. As seen in Figure 2, around nine in ten black participants felt accepting, determined and optimistic about their V.I. The most common feelings among Asian participants were acceptance, determination and frustration. Despite the overall prevalence of positive feelings, over six in ten participants in both groups also felt frustrated and worried, and just over half of Asian participants also felt sad.

There were no further statistically significant differences between the two groups. Around eight in ten participants in both groups agreed that they were who they were and their V.I. was part of them. Over a third of Asian participants (36.9%) agreed that they were struggling to come to terms with being visually impaired compared to 9.1% of black participants, but this did not reach statistical significance, $U = 635$, $p = 0.072$. Moreover, Asian participants were between three and four times more likely than black participants to 'strongly agree' that they often worried about what people thought of them (19.6% vs. 4.5%), that they frequently thought about their V.I. and the impact it had on their life (47.8% vs. 18.2%), and that they felt anxious about the future (26.1% vs. 9.1%). Although they were slightly less likely to agree (strongly and slightly) with the last statement (71.8% vs. 77.3%) In addition, they were less likely than black participants to 'strongly agree' that they were able to talk to others about their V.I. without getting upset (50.0% vs. 63.6%), but the proportion who agreed (strongly and slightly) was relatively similar (71.7% vs. 72.7%).

Despite the potentially greater emotional impact of V.I. among Asian participants, emotional support to come to terms with V.I. was slightly more important to black participants, who were also slightly more likely than Asian participants to agree that they received the level of emotional support that they needed to get on with their life

TABLE 1 Participant characteristics, by subgroup.

	Asian (n = 46)	Black (n = 22)	MEC (n = 77)	WC (n = 77)
	% (n)	% (n)	% (n)	% (n)
Age	$U = 500.5$, $p = 0.942$		$U = 2{,}919.5$, $p = 0.871$	
M (SD)	40.17 (14.61)	39.18 (14.70)	40.78 (15.58)	41.09 (15.62)
Range	18–74	18–75	18–85	18–85
Gender	X^2 (1, 68) = 0.49, $p = 0.482$		X^2 (1, 154) = 0.00, $p = 1.00$	
Female	50.0 (23)	59.1 (13)	51.9 (40)	51.9 (40)
Male	50.0 (23)	40.9 (9)	48.1 (37)	48.1 (37)
Region	$p = 0.789$		$p = 0.344$	
London	41.3 (19)	59.1 (13)	44.2 (34)	31.2 (24)
South East	4.3 (2)	9.1 (2)	6.5 (5)	2.6 (2)
South West	6.5 (3)	–	5.2 (4)	3.9 (3)
East of England	6.5 (3)	4.5 (1)	5.2 (4)	2.6 (2)
East Midlands	2.2 (1)	4.5 (1)	3.9 (3)	5.2 (4)
West Midlands	6.5 (3)	–	5.2 (4)	2.6 (2)
North East	–	–	–	5.2 (4)
North West	17.4 (8)	9.1 (2)	13.0 (10)	23.4 (18)
Yorkshire & the Humber	4.3 (2)	4.5 (1)	3.9 (3)	3.9 (3)
Scotland	4.3 (2)	9.1 (2)	7.8 (6)	9.1 (7)
Wales	4.3 (2)	–	3.9 (3)	7.8 (6)
Northern Ireland	2.2 (1)	–	1.3 (1)	2.6 (2)
Setting	$p = 0.234$		X^2 (2, 154) = 4.68, $p = 0.097$	
City/big town	67.4 (31)	77.3 (17)	67.5 (52)	55.8 (43)
Small town	26.1 (12)	9.1 (2)	22.1 (17)	37.7 (29)
Rural area	6.5 (3)	13.6 (3)	10.4 (8)	6.5 (5)
Education[1]	$U = 518$, $p = 0.086$		$U = 2{,}794$, $p = 0.397$	
No formal qualifications	–	–	–	5.2 (4)
GCSE/O-Level	15.2 (7)	4.5 (1)	11.7 (9)	14.3 (11)
A-Level /Advanced Highers	15.2 (7)	9.1 (2)	15.6 (12)	18.2 (14)
Apprenticeship, vocational, NVQ or HND	17.4 (8)	18.2 (4)	16.9 (13)	11.7 (9)
Undergraduate degree	30.4 (14)	22.7 (5)	27.3 (21)	31.2 (24)
Masters, PhD	15.2 (7)	31.8 (7)	18.2 (14)	16.9 (13)
Non-UK qualifications	4.3 (2)	–	3.9 (3)	–
Other	2.2 (1)	13.6 (3)	6.5 (5)	2.6 (2)
Employment[2]	$p = 0.771$		X^2 (4, 154) = 0.33, $p = 0.988$	
Employed (including part-time)	41.3 (19)	54.5 (12)	42.9 (33)	40.3 (31)
Self-employed	8.7 (4)	4.5 (1)	6.5 (5)	5.2 (4)
Unemployed	19.6 (9)	9.1 (2)	14.3 (11)	14.3 (11)
Retired	6.5 (3)	9.1 (2)	10.4 (8)	11.7 (9)
Other[2]	23.9 (11)	22.7 (5)	26.0 (20)	28.6 (22)
Marital status	$p = 0.379$		$p = 0.835$	
Single	37.0 (17)	54.5 (12)	41.6 (32)	37.7 (29)
In a relationship	10.9 (5)	–	7.8 (6)	9.1 (7)
Cohabiting	8.7 (4)	4.5 (1)	6.5 (5)	10.4 (8)
Married	34.8 (16)	27.3 (6)	31.2 (24)	36.4 (28)
Civil partnership	2.2 (1)	–	2.6 (2)	–

(Continued)

TABLE 1 (Continued)

	Asian (n = 46)	Black (n = 22)	MEC (n = 77)	WC (n = 77)
	% (n)	% (n)	% (n)	% (n)
Separated	–	4.5 (1)	1.3 (1)	1.3 (1)
Divorced	6.5 (3)	9.1 (2)	6.5 (5)	3.9 (3)
Widowed	–	–	2.6 (2)	1.3 (1)
V.I. severity[3]	U = 552.5, p = 0.516		U = 2,951, p = 0.922	
Severe	41.3 (19)	31.8 (7)	39.0 (30)	44.2 (34)
Moderate	34.8 (16)	40.9 (9)	35.1 (27)	23.4 (18)
Mild	23.9 (11)	27.3 (6)	26.0 (20)	31.2 (24)
Could not be classified	–	–	–	1.3 (1)

[1] Statistical analysis excludes Non-UK qualifications and Other. [2] Due to expected frequencies of less than 5 in 5 cells (27.8%), the categories Looking after family/home, Student, Long-term sick/disabled and Unpaid work (e.g., volunteering, intern, and work experiences) were collapsed into the Other category for the statistical analysis. [3] Statistical analysis excludes could not be classified. MEC, minority ethnic communities (excluding white minorities), WC, White communities (including white minorities). Results for Fisher's exact test are shown as p-values only.

TABLE 2 Positive and negative feelings about V.I., by subgroup.

	Asian (n = 46)	Black (n = 22)		MEC (n = 77)	WC (n = 77)	
	% (n)	% (n)	X^2 (1, N = 68)	% (n)	% (n)	X^2 (1, N = 154)
Positive feelings						
Accepting	78.3 (36)	95.5 (21)	p = 0.089	80.5 (62)	77.9 (60)	0.16, p = 0.691
Determined	76.1 (35)	95.5 (21)	p = 0.086	79.2 (61)	84.4 (65)	0.70, p = 0.403
Optimistic	60.9 (28)	86.4 (19)	**4.53, p = 0.033**	68.8 (53)	53.2 (41)	**3.93, p = 0.047**
Confident	52.2 (24)	63.6 (14)	0.79, p = 0.373	57.1 (44)	53.2 (41)	0.24, p = 0.627
Happy	52.2 (24)	50.0 (11)	0.03, p = 0.867	51.9 (40)	53.2 (41)	0.03, p = 0.872
Negative feelings						
Frustrated	73.9 (34)	63.6 (14)	0.76, p = 0.384	68.8 (53)	76.6 (59)	1.18, p = 0.278
Worried	69.6 (32)	63.6 (14)	0.24, p = 0.625	64.9 (50)	54.5 (42)	1.73, p = 0.189
Sad	52.2 (24)	31.8 (7)	2.49, p = 0.115	45.5 (35)	40.3 (31)	0.42, p = 0.515
Overwhelmed	45.7 (21)	31.8 (7)	1.18, p = 0.278	39.0 (30)	32.5 (25)	0.71, p = 0.400
Angry	30.4 (14)	27.3 (6)	0.07, p = 0.789	28.6 (22)	32.5 (25)	0.28, p = 0.600
Confused	34.8 (16)	13.6 (3)	3.31, p = 0.069	28.6 (22)	26.0 (20)	0.13, p = 0.717
Rejected	32.6 (15)	13.6 (3)	2.75, p = 0.097	24.7 (19)	15.6 (12)	1.98, p = 0.159
Embarrassed	26.1 (12)	13.6 (3)	p = 0.353	22.1 (17)	23.4 (18)	0.04, p = 0.848
Ashamed	17.4 (8)	4.5 (1)	p = 0.253	14.3 (11)	13.0 (10)	0.06, p = 0.814

MEC, Minority ethnic communities (excluding white minorities); WC, white communities (including white minorities). Statistically significant results are shown in bold. Results of Fisher's exact test are shown as p-values only.

(68.2% vs. 63.0%). Only 4.5% of black participants, respectively, rated emotional support as 'not important at all' and 'strongly disagreed' that they got the emotional support they needed to get on with their life, compared to 8.7%, respectively, of Asian participants.

There were also few statistically significant differences when comparing MEC and WC participants. MEC participants were significantly more likely to feel optimistic about their V.I., X^2 (1, 154) = 3.93, p = 0.047, Cramer's V = 0.160, and to rate emotional support to come to terms with V.I. as important, U = 2446.5, p = 0.047. But they were significantly less likely to agree that they got the level of emotional support they needed to get on with their life, U = 3,638, p = 0.010.

Contrary to Asian and black participants, there was no clear pattern of how WC and MEC participants felt about their V.I.: WC participants were more likely than MEC participants to feel frustrated, angry and embarrassed but also determined and happy about their V.I. In contrast, MEC participants were more likely than WC participants to feel optimistic, accepting, confident, but also worried, confused, ashamed, rejected, overwhelmed and sad about their V.I. In addition, MEC participants were more likely than WC participants to agree that they felt anxious about the future (71.5% vs. 56.6%) although the latter were slightly more likely to 'strongly agree' (22.1% vs. 26.3%) – and to frequently think about their V.I. and its impact on their life (71.5% vs. 58.5%). MEC participants were also around twice

TABLE 3 Emotional impact of V.I., by subgroup.

	Asian (n = 46)	Black (n = 22)	MEC (n = 77)	WC (n = 77)
	% (n)	% (n)	% (n)	% (n)
Emotional support to come to terms with V.I.	$U = 451$, $p = 0.438$		**U = 2,446.5, p = 0.047**	
Extremely important	43.5 (20)	50.0 (11)	48.1 (37)	32.5 (25)
Very important	32.6 (15)	36.4 (8)	31.2 (24)	36.4 (28)
Somewhat important	15.2 (7)	9.1 (2)	13.0 (10)	20.8 (16)
Not important at all	8.7 (4)	4.5 (1)	7.8 (6)	10.4 (8)
Feels anxious about the future	$U = 547$, $p = 0.558$		$U = 2{,}684$, $p = 0.356$	
Strongly agree	26.1 (12)	9.1 (2)	22.1 (17)	26.3 (20)
Slightly agree	45.7 (21)	68.2 (15)	49.4 (38)	30.3 (23)
Neither/nor	13.0 (6)	–	9.1 (7)	13.2 (10)
Slightly disagree	2.2 (1)	22.7 (5)	7.8 (6)	14.5 (11)
Strongly disagree	13.0 (6)	–	11.7 (9)	15.8 (12)
Struggling to come to terms with being visually impaired	$U = 635$, $p = 0.072$		$U = 2{,}946$, $p = 0.938$	
Strongly agree	15.2 (7)	–	10.4 (8)	11.8 (9)
Slightly agree	21.7 (10)	9.1 (2)	19.5 (15)	19.7 (15)
Neither/nor	8.7 (4)	9.1 (2)	9.1 (7)	7.9 (6)
Slightly disagree	10.9 (5)	27.3 (6)	15.6 (12)	14.5 (11)
Strongly disagree	43.5 (20)	54.5 (12)	45.5 (35)	46.1 (35)
Able to talk to others about their V.I. without getting upset	$U = 451.5$, $p = 0.433$		$U = 3{,}171.5$, $p = 0.412$	
Strongly agree	50.0 (23)	63.6 (14)	53.2 (41)	53.2 (41)
Slightly agree	21.7 (10)	9.1 (2)	19.5 (15)	32.5 (25)
Neither/nor	8.7 (4)	4.5 (1)	6.5 (5)	6.5 (5)
Slightly disagree	8.7 (4)	18.2 (4)	13.0 (10)	5.2 (4)
Strongly disagree	10.9 (5)	4.5 (1)	7.8 (6)	2.6 (2)
Often worried about what people think of them	$U = 544.5$, $p = 0.601$		$U = 3{,}051.5$, $p = 0.745$	
Strongly agree	19.6 (9)	4.5 (1)	14.3 (11)	19.5 (15)
Slightly agree	30.4 (14)	40.9 (9)	32.5 (25)	28.6 (22)
Neither/nor	10.9 (5)	18.2 (4)	11.7 (9)	5.2 (4)
Slightly disagree	8.7 (4)	9.1 (2)	10.4 (8)	18.2 (14)
Strongly disagree	30.4 (14)	27.3 (6)	31.2 (24)	28.6 (22)
Frequently thinks about their V.I. and the impact it has on their life	$U = 621.5$, $p = 0.109$		$U = 2{,}670.5$, $p = 0.270$	
Strongly agree	47.8 (22)	18.2 (4)	35.1 (27)	29.9 (23)
Slightly agree	28.3 (13)	54.5 (12)	36.4 (28)	28.6 (22)
Neither/nor	2.2 (1)	4.5 (1)	5.2 (4)	10.4 (8)
Slightly disagree	8.7 (4)	13.6 (3)	9.1 (7)	18.2 (14)
Strongly disagree	13.0 (6)	9.1 (2)	14.3 (11)	13.0 (10)
I am who I am, my V.I. is part of me	$U = 535$, $p = 0.646$		$U = 3{,}191$, $p = 0.231$	
Strongly agree	69.6 (32)	63.6 (14)	66.2 (51)	73.7 (56)
Slightly agree	15.2 (7)	22.7 (5)	18.2 (14)	18.4 (14)
Neither/nor	8.7 (4)	–	5.2 (4)	3.9 (3)
Slightly disagree	4.3 (2)	9.1 (2)	7.8 (6)	2.6 (2)

(Continued)

TABLE 3 (Continued)

	Asian (n = 46)	Black (n = 22)	MEC (n = 77)	WC (n = 77)
	% (n)	% (n)	% (n)	% (n)
Strongly disagree	2.2 (1)	4.5 (1)	2.6 (2)	1.3 (1)
Gets the level of emotional support needed to get on with life	U = 484.5, p = 0.770		**U = 3,638, p = 0.010**	
Strongly agree	30.4 (14)	36.4 (8)	32.5 (25)	45.5 (35)
Slightly agree	32.6 (15)	31.8 (7)	29.9 (23)	35.1 (27)
Neither/nor	15.2 (7)	–	10.4 (8)	9.1 (7)
Slightly disagree	13.0 (6)	27.3 (6)	18.2 (14)	10.4 (8)
Strongly disagree	8.7 (4)	4.5 (1)	9.1 (7)	–

MEC, minority ethnic communities (excluding white minorities); WC, white communities (including white minorities). Statistically significant results are shown in bold.

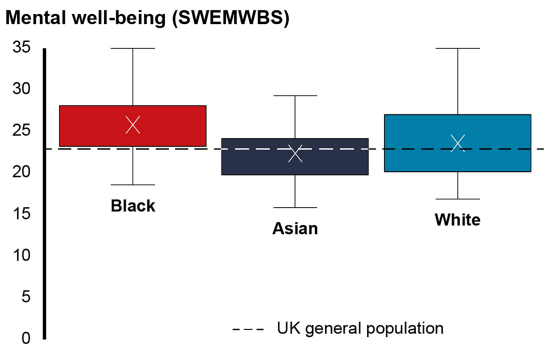


FIGURE 1
Snapshot of mental well-being by subgroup.

as likely as WC participants to be unable to talk to others about their V.I. without getting upset (20.8% vs. 7.8%). But similar proportions of MEC and WC participants reported being often worried about what people thought of them (46.8% vs. 48.1%). Just under a third of participants in both groups agreed that they were struggling to come to terms with having a V.I. In relation to identity, nine in ten WC participants agreed that their V.I. was part of who they were compared to eight in ten MEC participants, who were more than 2.5 times more likely to disagree with this statement (10.4% vs. 3.9%).

3.2. Prejudice and discrimination

There were no statistically significant differences between WC and MEC participants, but participants from Asian communities were significantly more likely than black participants to agree that the general public were often prejudiced against people with sight impairment, U = 688, p = 0.013 (Table 4). As seen in Figure 3, just over two thirds (67.4%) of Asian participants agreed at least slightly with this statement compared to half of black participants (50.0%). The former were just over 3.5 times more likely to 'strongly agree' (32.6% vs. 9.1%), and black participants were over seven times more likely to 'strongly disagree' (4.3% vs. 31.8%). While there were no further statistically significant differences, Asian participants were also more likely than black participants to agree that they had experienced negative attitudes or discrimination due to their sight impairment (71.8% vs. 54.5%), although participants from black communities were slightly more likely to "strongly agree" with this statement (40.9% vs. 37.0%). Similarly, Asian participants were more likely than black participants to rate understanding among the general public about how they can help people with V.I. as "extremely" or "very important" (84.4% vs. 68.2%), but none of the black participants rated this as "not important at all", compared to 4.4% of Asian participants.

Although there were no statistically significant differences between MEC and WC participants, experiences of negative attitudes and prejudice were slightly higher among MEC participants: 63.7% of MEC participants agreed that they had experienced negative attitudes or discrimination due to their V.I. and 59.8% agreed that the general public are often prejudiced against people with V.I., compared to 58.5 and 49.4% of WC participants, respectively. MEC participants were also slightly more likely to 'strongly agree' that the general public were often prejudiced (13.0% vs. 10.4%). Similar proportions of MEC and WC participants rated understanding among the general public as "extremely" or "very important" (80.3% vs. 76.7%). But 3.9% of MEC participants also rated this as "not important at all" compared to none of the WC participants.

4. Discussion

This article provides an overview of the emotional and mental well-being impacts of V.I. and experiences of prejudice and discrimination among a sample of MEC adults, including those from Asian and black communities, compared to WC adults. Overall, there were few statistically significant differences between the groups. MEC participants were significantly more likely than WC participants to rate emotional support to come to terms with their V.I. as important and to feel optimistic about their V.I. but they were significantly less likely to agree that they were receiving the level of emotional support they needed to get on with their life. Within the MEC group, participants from Asian communities had significantly poorer mental well-being than black participants as assessed by SWEMWBS. They were also significantly more likely to agree that the general public were often prejudiced against people with V.I. and less likely to feel optimistic about their V.I. than black participants.

The mental well-being score of MEC (M = 23.29, SD = 4.66) and WC participants (M = 23.58, SD = 4.81) was similar to the UK general

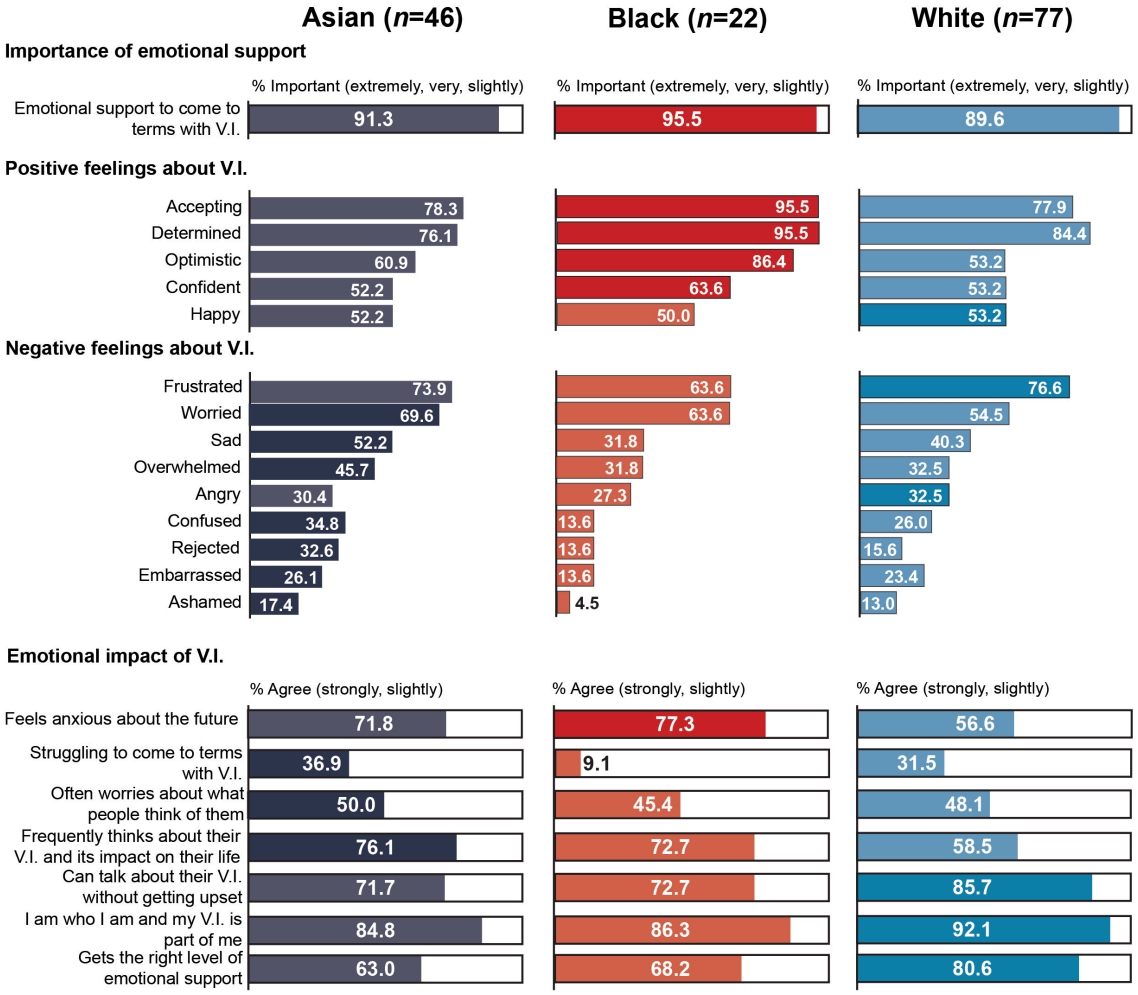


FIGURE 2
Snapshot of the emotional impact of V.I. by subgroup.

population norm ($M = 23.5$, SD = 3.9) (38) and the unadjusted SWEMWBS score previously reported for people with sight loss in the UK ($M = 23.23$) (14). Encouragingly, black participants ($M = 25.79$, SD = 4.08) scored above both people with sight loss and the UK general population in terms of mental well-being. This reflects higher SWEMWBS scores among black participants relative to other ethnic groups in a general population sample (38). Compared to Asian and WC participants, black participants were most likely to feel accepting, determined, optimistic and confident and least likely to feel frustrated, sad, overwhelmed, angry, confused, rejected, embarrassed and ashamed about their V.I., although around two thirds of black participants also reported feeling frustrated and worried about their V.I. In addition, black participants were least likely to be struggling to come to terms with being visually impaired and to worry about what people thought of them. It is unclear if this reflects greater resilience, better access to support, a reluctance to report emotional and mental health difficulties and/or selection bias among this group, whereby those with better mental and emotional well-being were more willing to take part in the research. There is evidence of cultural barriers that may prevent MEC people, particularly men, from talking about emotional and mental health difficulties (39). Cross et al. (26) note the impact of intra-cultural stereotypes of Afro-Caribbean people, including women, as being proud, stoic and independent, on the sharing of family histories of V.I. and timely treatment-seeking. These stereotypes conflict with perceptions associating blindness with helplessness, social isolation, and being a victim (26). It is possible that unhelpful perceptions within and/or outside the communities may have acted as a barrier to sharing emotional difficulties in the current sample. Alternatively, black participants may benefit from better acess to support than other groups. Explorations of social functioning found that nine in ten black participants agreed that they felt supported by family and friends (36). Such informal social networks may provide a safe space to discuss emotional and mental health difficulties (39). However, almost a third of black participants disagreed that they got the level of emotional support they needed. This is considerably higher than the proportion of WC (10.4%) and also Asian participants (21.7%) who disagreed that they got the level of emotional support they needed, although the latter were more likely to disagree strongly. The importance assigned to better emotional support to come to terms with V.I. among black participants may reflect a need for more formal emotional support structures outside of the family and their social network. The extent to which V.I. impacts on the emotional and mental well-being of adults from black communities will need to be confirmed in future research, which could also explore the impact

TABLE 4 Perceptions of negative attitudes and discrimination, by subgroup.

	Asian (n = 46)	Black (n = 22)	MEC (n = 77)	WC (n = 77)
	% (n)	% (n)	% (n)	% (n)
Understanding among the general public about how they can help people with V.I.	U = 547.5, p = 0.452		U = 2,759.5, p = 0.514	
Extremely important	44.4 (20)	40.9 (9)	46.1 (35)	40.3 (31)
Very important	40.0 (18)	27.3 (6)	34.2 (26)	36.4 (28)
Somewhat important	11.1 (5)	31.8 (7)	15.8 (12)	23.4 (18)
Not important at all	4.4 (2)	–	3.9 (3)	–
Has experienced negative attitudes or discrimination due to their V.I.	U = 566, p = 0.411		U = 2,733, p = 0.386	
Strongly agree	37.0 (17)	40.9 (9)	36.4 (28)	29.9 (23)
Slightly agree	34.8 (16)	13.6 (3)	27.3 (21)	28.6 (22)
Neither agree nor disagree	4.3 (2)	4.5 (1)	6.5 (5)	2.6 (2)
Slightly disagree	13.0 (6)	9.1 (2)	10.4 (8)	18.2 (14)
Strongly disagree	10.9 (5)	31.8 (7)	19.5 (15)	20.8 (16)
General public are often prejudiced against people with V.I.	**U = 688, p = 0.013**		U = 2,688, p = 0.304	
Strongly agree	32.6 (15)	9.1 (2)	24.7 (19)	19.5 (15)
Slightly agree	34.8 (16)	40.9 (9)	35.1 (27)	29.9 (23)
Neither/nor	15.2 (7)	9.1 (2)	14.3 (11)	18.2 (14)
Slightly disagree	13.0 (6)	9.1 (2)	13.0 (10)	22.1 (17)
Strongly disagree	4.3 (2)	31.8 (7)	13.0 (10)	10.4 (8)

MEC, minority ethnic communities (excluding white minorities), WC, white communities (including white minorities). Statistically significant results are shown in bold.

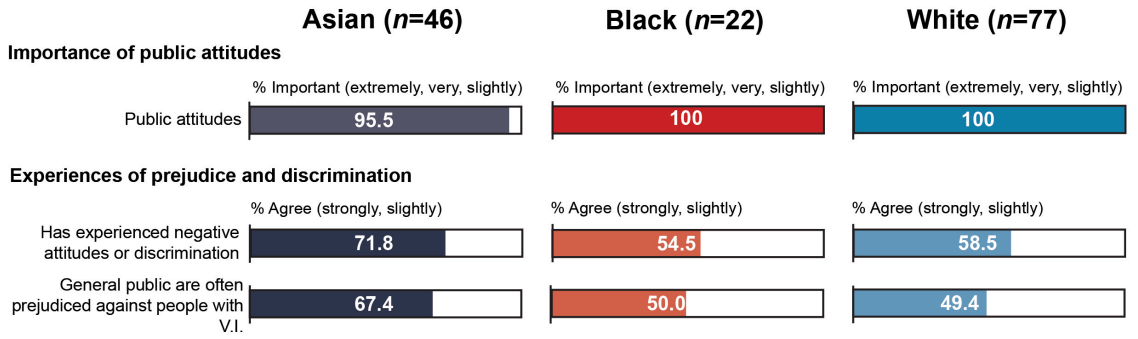


FIGURE 3
Snapshot of perceived prejudice and discrimination by subgroup.

of cultural perceptions and attitudes towards health-related issues, including V.I. and mental health difficulties, on resilience and mental well-being, and the role of formal and informal support networks in meeting emotional and mental well-being needs.

In contrast, participants from Asian communities appeared to be particularly impacted by their V.I. The mental well-being score for Asian participants (M = 22.37, SD = 4.21) was lower than for any other group, including the wider population of people with sight loss (14) and the UK general population (38). Asian participants were more likely to feel worried, sad, overwhelmed, confused, rejected, embarrassed and ashamed, and they were less likely to feel determined and confident than both black and WC participants. This may indicate unmet emotional and mental well-being support needs among this group which could reflect several factors. Although the evidence is mixed, some studies have identified poorer mental well-being among some South Asian groups, particularly women (40, 41). For instance, Fazil and Cochrane (42) found a higher prevalence of depression as assessed by the 28 item General Health Questionnaire (GHQ-28) among a sample of Pakistani women in the West Midlands compared to white women, with levels being lower among those in employment and those who had been in living in the UK for longer. However, Asian people in England were found to be more likely to have high mental well-being as assessed by

SWEMWBS relative to white people (38). While 8 in 10 Asian participants in this sample felt supported by family and friends, their support network was smaller than for the other groups and they felt significantly more isolated than black participants (36). There is evidence of stigma associated with emotional and mental health difficulties which may prevent MEC people from seeking help for these difficulties (39). Although informal social networks have been identified as a viable alternative to seeking formal mental health support (39), smaller social networks may impact on individual's access to this informal support.

Over two thirds of Asian participants agreed that the general public were often prejudiced against people with V.I. and just under three quarters had experienced discrimination and prejudice due to their V.I. This may at least partly explain the poorer emotional and mental well-being found in this group. Negative public attitudes towards people living with V.I. have been identified as one of the biggest barriers to participation in everyday life by those living with V.I. (20), and research demonstrates the negative impact of discrimination on mental health among adults with V.I. (22). While comparatively lower, around half of black and WC participants also agreed that the public was often prejudiced against people with V.I. and over half had experienced discrimination and prejudice themselves. This is despite UK legislation to protect people with V.I. and other disabilities from discrimination. The survey does not explore what form the discrimination took, and it is not possible to draw conclusions about the impact of negative attitudes on the emotional impact of V.I. and mental well-being. But around half of participants across all groups agreed that they often worried about what people thought about them and public attitudes emerged as a priority issue among all groups. The limited available evidence (26, 27, 43) suggests that the perceptions and attitudes towards people living with V.I. held by different communities have the potential to impact on identity, adapting to sight loss, and timely treatment-seeking. For instance, treatment may be delayed among Indian communities because sight loss was viewed as being a part of the ageing process and a major disability only once there was substantial dependence and loss of function (27), while among Somali communities, V.I. was associated with stigma, related to perceptions of not existing and helplessness, which resulted in a reluctance to identify as having V.I. (25).

Unhelpful perceptions of V.I. held by the general public have also been found to impact on the extent to which people, particularly those with partial sight loss, can develop a positive V.I. identity (44). Previous research has shown that acceptance of V.I. may be associated with better well-being and lower levels of depression (45), and that a positive disability identity has been associated with a greater sense of belonging. The latter, in turn, has been associated with better physical health and mood, although these effects were mediated by self-esteem (46). In this study, most participants in all groups viewed V.I. as a part of their identity: at least eight in ten participants in all groups agreed that they were who they were and that their V.I. was part of them. However, the current data does not specify if V.I. constitutes a positive, negative or neutral part of participants' identity.

4.1. Limitations

There are several sample-related limitations which impact on the generalizability of findings: findings are based on a relatively small convenience sample, which excluded non-English speakers and institutionalized adults. These individuals may be particularly vulnerable and in need of support. Subsample sizes for minority ethnic communities were particularly small, impacting on statistical power. Despite the diversity of communities included under the labels "Asian", "black", and "white", it was not possible to disaggregate groups further. Findings for the Asian communities, for instance, may reflect the experiences of Pakistani but not Chinese adults.

There were additional survey-related limitations: individual survey topics (e.g., experiences of prejudice) were not explored in-depth and it is not possible to draw conclusions about the reasons for individual findings. In addition, the wording of some questions and/or response options made it difficult to interpret findings. For instance, a "slightly agree" response to the statement *I've experienced negative attitudes or discrimination due to my V.I.* may express uncertainty about whether a participant had experienced discrimination, relate to the frequency (occurred only once or twice), the timing (has not occurred recently), the seriousness, or the impact of the discrimination. Despite this, these questions give an indication of participants' experiences, with the caveat that they will need to be confirmed.

4.2. Conclusion

Overall, there were few statistically significant differences between the groups. While participants from black communities fared the same as, or in some cases better than, white participants, participants from Asian communities were more likely to report poor mental and emotional well-being, and experiences of discrimination, than black and white participants. This highlights the need for future research with larger samples and with individual communities to confirm these findings and explore reasons for differences in mental and emotional well-being. This includes the role of public and community attitudes and perceptions of people with V.I. on well-being and identity.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

Author contributions

NH: Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing – original draft. CC: Visualization, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This research was supported by the Thomas Pocklington Trust, grant number: FR-00380.

Acknowledgments

We would like to thank the Royal National Institute of the Blind (RNIB), Thomas Pocklington Trust (TPT) and Guide Dogs for the Blind Association (Guide Dogs) for sharing "V.I. Lives" survey data with us for the purpose of this secondary analysis. A particular thank you to Hilary Ingleton at the RNIB for providing the data set and answering questions about the survey methods, data collection and individual variables.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Pezzullo L, Streatfeild J, Simkiss P, Shickle D. The economic impact of sight loss and blindness in the UK adult population. *BMC Health Serv Res*. (2018) 18:1–13. doi: 10.1186/s12913-018-2836-0

2. Dawes P, Dickinson C, Emsley R, Bishop PN, Cruickshanks KJ, Edmondson-Jones M, et al. Vision impairment and dual sensory problems in middle age. *Ophthalmic Physiol Opt*. (2014) 34:479–88. doi: 10.1111/opo.12138

3. Cumberland PM, Rahi JS. Visual function, social position, and health and life chances: the UK biobank study. *JAMA Ophthalmol*. (2016) 134:959–66. doi: 10.1001/jamaophthalmol.2016.1778

4. Deloitte Access Economics. *The economic impact of sight loss and blindness in the UK adult population, 2013*. London, UK: RNIB (2014).

5. Heinze N, Jones L, Makwana B. A rapid review of evidence relating to service use, experiences, and support needs of adults from minority ethnic communities along the eyecare pathway in the United Kingdom. *Front Public Health*. (2023) 11:11. doi: 10.3389/fpubh.2023.1119540

6. Kempen GIJM, Ballemans J, Ranchor AV, van Rens GHMB, Zijlstra GAR. The impact of low vision on activities of daily living, symptoms of depression, feelings of anxiety and social support in community-living older adults seeking vision rehabilitation services. *Qual Life Res*. (2012) 21:1405–11. doi: 10.1007/s11136-011-0061-y

7. van der Aa HP, Comijs HC, Penninx BW, van Rens GH, van Nispen RM. Major depressive and anxiety disorders in visually impaired older adults. *Invest Ophthalmol Vis Sci*. (2015) 56:849–54. doi: 10.1167/iovs.14-15848

8. Frank CR, Xiang X, Stagg BC, Ehrlich JR. Longitudinal associations of self-reported vision impairment with symptoms of anxiety and depression among older adults in the United States. *JAMA Ophthalmol*. (2019) 137:793–800. doi: 10.1001/jamaophthalmol.2019.1085

9. Fenwick EK, Pesudovs K, Khadka J, Dirani M, Rees G, Wong TY, et al. The impact of diabetic retinopathy on quality of life: qualitative findings from an item bank development project. *Qual Life Res*. (2012) 21:1771–82. doi: 10.1007/s11136-012-0110-1

10. Schliermann R, Heydenreich P, Bungter T, Anneken V. Health-related quality of life in working-age adults with visual impairments in Germany. *Disabil Rehabil*. (2017) 39:428–37. doi: 10.3109/09638288.2016.1146353

11. Zhang X, Bullard KM, Cotch MF, Wilson MR, Rovner BW, McGwin G, et al. Association between depression and functional vision loss in persons 20 years of age or older in the United States, NHANES 2005-2008. *JAMA Ophthalmol*. (2013) 131:573–81. doi: 10.1001/jamaophthalmol.2013.2597

12. Tabandeh H, Lockley SW, Buttery R, Skene DJ, Defrance R, Arendt J, et al. Disturbance of sleep in blindness. *Am J Ophthalmol*. (1998) 126:707–12. doi: 10.1016/s0002-9394(98)00133-0

13. Choi SU, Chun YS, Lee JK, Kim JT, Jeong JH, Moon NJ. Comparison of vision-related quality of life and mental health between congenital and acquired low-vision patients. *Eye*. (2019) 33:1540–6. doi: 10.1038/s41433-019-0439-6

14. McManus S, Lord C. *Circumstances of people with sight loss: secondary analysis of understanding society and the life opportunities survey* NatCen. London, UK:RNIB (2021).

15. Alma MA. Participation of the elderly after vision loss. *Disabil Rehabil*. (2011) 33:63–72. doi: 10.3109/09638288.2010.488711

16. Gopinath B, Liew G, Burlutsky G, Mitchell P. Age-related macular degeneration and 5-year incidence of impaired activities of daily living. *Maturitas*. (2014) 77:263–6. doi: 10.1016/j.maturitas.2013.12.001

17. Coffey M, Coufopoulos A, Kinghorn K. Barriers to employment for visually impaired women. *Int J Workplace Health Manag*. (2014) 7:171–85. doi: 10.1108/IJWHM-06-2013-0022

18. Jaarsma EA, Dekker R, Koopmans SA, Dijkstra PU, Geertzen JH. Barriers to and facilitators of sports participation in people with visual impairments. *Adapt Phys Act Q*. (2014) 31:240–64. doi: 10.1123/2013-0119

19. Phoenix C, Griffin M, Smith B. Physical activity among older people with sight loss: a qualitative research study to inform policy and practice. *Public Health*. (2015) 129:124–30. doi: 10.1016/j.puhe.2014.10.001

20. Fisher DIH, Dennison C. *Barriers faced by blind and partially sighted people: RNIB strategic prioritisation research*. London, UK: RNIB (2018).

21. Slade J, Edwards E. *My voice: the views and experiences of blind and partially sighted people in the UK*. London, UK: RNIB (2015).

22. Jackson SE, Hackett RA, Pardhan S, Smith L, Steptoe A. Association of perceived discrimination with emotional well-being in older adults with visual impairment. *JAMA Ophthalmol*. (2019) 137:825–32. doi: 10.1001/jamaophthalmol.2019.1230

23. Grey T, Sewell H, Shapiro G, Ashraf F. Mental health inequalities facing UK minority ethnic populations: causal factors and solutions. *J Psychol Issues Organ Cult*. (2013) 3:146–57. doi: 10.1002/jpoc.21080

24. Hussain B, Hui A, Timmons S, Nkhoma K. Ethnic mental health inequalities and mental health policies in England 1999-2020. *J Public Ment Health*. (2022) 21:162–73. doi: 10.1108/JPMH-06-2021-0080

25. Higginbottom GM, Rivers K, Story R. Health and social care needs of Somali refugees with visual impairment (VIP) living in the United Kingdom: a focused ethnography with Somali people with VIP, their caregivers, service providers, and members of the horn of Africa blind society. *J Transcult Nurs*. (2014) 25:192–201. doi: 10.1177/1043659613515715

26. Cross V, Shah P, Bativala R, Spurgeon P. Glaucoma awareness and perceptions of risk among African–Caribbeans in Birmingham, UK. *Divers Health Soc Care*. (2005) 2:81–90.

27. Patel D, Baker H, Murdoch I. Barriers to uptake of eye care services by the Indian population living in Ealing, West London. *Health Educ J*. (2006) 65:267–76. doi: 10.1177/0017896906067777

28. RNIB, Guide Dogs, TPT. *VI lives – an in-depth understanding of the experiences of people living with vision impairment (VI) in the UK*. London, UK: RNIB, Guide Dogs, TPT (2022).

29. Heinze N, Jones L. *Priority issues among a sample of adults from minority ethnic communities who are living with visual impairment in the UK*. Submitted for publication. (2023).

30. Stewart-Brown S, Tennant A, Tennant R, Platt S, Parkinson J, Weich S. Internal construct validity of the Warwick-Edinburgh mental well-being scale (WEMWBS): a Rasch analysis using data from the Scottish health education population survey. *Health Qual Life Outcomes*. (2009) 7:1–8. doi: 10.1186/1477-7525-7-15

31. R Core Team. *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing (2021).

32. IBM Corp. *IBM SPSS statistics for windows*, Version 28.0. Armonk, NY: IBM Corp (2021).

33. Heinze N, Castle CL, RSM Gomes. *Education, employment and financial status among adults from minority ethnic communities living with visual impairment in the UK*. Submitted for publication. (2023).

34. Hussain SF, Heinze N, RSM Gomes. *Health and comorbidities in minority ethnic adults living with visual impairment in the UK* Submitted for publication. (2023).

35. Kempapidis T, Green A, Heinze N, RSM Gomes. *Accessibility, functioning and activities of daily living amongst adults from minority ethnic communities with visual impairment in the UK*. Submitted for publication. (2023).

36. Heinze N, Jones L. *Social functioning in adults from minority ethnic communities living with visual impairment in the UK*. Submitted for publication. (2023).

37. Heinze N, Jones L. *Access to eye care and support services among adults from minority ethnic communities living with visual impairment in the UK*. Submitted for publication. (2023).

38. Ng Fat L, Scholes S, Boniface S, Mindell J, Stewart-Brown S. Evaluating and establishing national norms for mental wellbeing using the short Warwick-Edinburgh mental well-being scale (SWEMWBS): findings from the health survey for England. *Qual Life Res*. (2017) 26:1129–44. doi: 10.1007/s11136-016-1454-8

39. Memon A, Taylor K, Mohebati LM, Sundin J, Cooper M, Scanlon T, et al. Perceived barriers to accessing mental health services among black and minority ethnic (BME) communities: a qualitative study in Southeast England. *BMJ Open*. (2016) 6:e012337. doi: 10.1136/bmjopen-2016-012337

40. Hussain F, Cochrane R. Depression in south Asian women living in the UK: a review of the literature with implications for service provision. *Transcult Psychiatry*. (2004) 41:253–70. doi: 10.1177/1363461504043567

41. Anand AS, Cochrane R. The mental health status of south Asian women in Britain: a review of the UK literature. *Psychol Dev Soc*. (2005) 17:195–214. doi: 10.1177/097133360501700207

42. Fazil Q, Cochrane R. The prevalence of depression in Pakistani women living in the west midlands. *Pak J Womens Stud*. (2003) 10:21–30.

43. Biddyr S, Molik B, Garwood P, Sheen N, Griffiths S, Porter T. *Eye health Care in Black and Minority Ethnic Communities*. UK: RNIB (2016).

44. Dale S. Songs at twilight: a narrative exploration of the experience of living with a visual impairment, and the effect this has on identity claims. *Br J Vis Impair*. (2010) 28:204–20. doi: 10.1177/0264619610368751

45. Bergeron CM, Wanet-Defalque M-C. Psychological adaptation to visual impairment: the traditional grief process revised. *Br J Vis Impair*. (2013) 31:20–31. doi: 10.1177/0264619612469371

46. Begen FM, Turner-Cobb JM. The need to belong and symptoms of acute physical health in early adolescence. *J Health Psychol*. (2012) 17:907–16. doi: 10.1177/1359105311431176

frontiers | Frontiers in Public Health

TYPE Perspective
PUBLISHED 06 October 2023
DOI 10.3389/fpubh.2023.1265046

OPEN ACCESS

EDITED BY
Julia Knopes,
Case Western Reserve University, United States

REVIEWED BY
Jenny Logan,
Brooklyn Institute for Social Research (BISR), United States

*CORRESPONDENCE
Vittorio Fineschi
✉ vittorio.fineschi@uniroma1.it

†These authors have contributed equally to this work and share first authorship

RECEIVED 21 July 2023
ACCEPTED 21 September 2023
PUBLISHED 06 October 2023

CITATION
Aguirre L, Padovano M, Scopetti M, La Russa R, Manetti F, D'Errico S, Frati P and Fineschi V (2023) Mental health law: a comparison of compulsory hospital admission in Italy and the UK.
Front. Public Health 11:1265046.
doi: 10.3389/fpubh.2023.1265046

Mental health law: a comparison of compulsory hospital admission in Italy and the UK

Lucienne Aguirre[1†], Martina Padovano[2†], Matteo Scopetti[3], Raffaele La Russa[4], Federico Manetti[2], Stefano D'Errico[5], Paola Frati[2] and Vittorio Fineschi[2*]

[1]City & Hackney Adult & Older People's Mental Health Services, East London Foundation NHS Trust, London, United Kingdom, [2]Department of Anatomical, Histological, Forensic and Orthopedic Sciences, Sapienza University of Rome, Rome, Italy, [3]Department of Medical Surgical Sciences and Translational Medicine, Sapienza University of Rome, Rome, Italy, [4]Department of Clinical and Experimental Medicine, University of Foggia, Foggia, Italy, [5]Department of Medical, Surgical and Health Sciences, University of Trieste, Trieste, Italy

In Europe, the mental health law legal framework has had several changes throughout the years to achieve and develop new reforms, better mental health care, and protect the human rights of patients. The UK national data shows rising detention rates and the disproportionate use of the legal framework among people from black and minority ethnic groups. At the national level, compulsory admissions are lower in Italy; it also shows that it has increased in the last few years in both countries. The lack of ethnic national data, especially in Italy, limited the ability to understand compulsory admission, discrimination, and stigma in mental health. The present study aims to compare the legal framework of mental health law and compulsory hospital admission in Italy and the UK. A review of each country's latest amendments to mental health law and the number of compulsory hospital admissions was conducted to understand the impact of changes in mental health care.

KEYWORDS

compulsory admission, mental health law, mental health care, fundamental rights, public health

1. Introduction

Throughout the years, the European legal framework on compulsory admissions and mental health care has changed, with reforms and debates regarding the rights of a person with mental illness. According to the currently prevailing orientation, it would be desirable to adopt tools aimed at reducing stigmatization, developing international standards, producing guidelines, as well as raising awareness of the ethical challenges imposed by compulsory admissions.

Compulsory hospital admissions of patients with mental disorders are defined as admission to a psychiatric hospital without consent. England and Wales further consider the admission of an incapacitated person (1). The criteria for compulsory admissions can vary among different countries in Europe. The criteria can be the duration for compulsory admissions, the reason for admission (potential danger to self and others), and the need for treatment. For example, in countries such as Denmark, France, Portugal, and Spain, there is no maximum period for compulsory admission. Instead, in countries like Italy and the UK, there is a time limit for compulsory admission. For most European countries, the diagnosis of a mental disorder is necessary for admission (2). The second most common criterion is the need for treatment; Italy

and Spain have implemented special legislation introducing the need-for-treatment criteria. The threat or actual danger to self or others is the most common additional criterion. Although previously Italian legislation focused on the legal obligation to protect society from the patient, it is interesting to note that Italy, and more recently Spain, removed the "danger to self and others" criterion from their reasons for compulsory admission (3). However, in countries like Denmark, Finland, Greece, Ireland, Portugal, and the UK, the consideration of the danger criterion (to self or others) is sufficient on its own (4). For example, refusing medication or treatment can be a sufficient reason to be admitted in countries like Belarus, Belgium, Finland, Ireland, Italy, and Russia. Finally, in Finland and Italy, a patient can be admitted if the outpatient procedure is not sufficient for the patient's medical needs.

In such a context, the present study aims to compare the legal framework of compulsory admissions between Italy and the UK, reviewing national databases and the latest changes in legislation. For this purpose, a narrative literature on the updated epidemiological data and relevant national documents has been conducted.

2. Mental health law legal framework

Reports from around the world highlight the need to address discrimination and promote human rights in mental health services. For this purpose, careful discipline of coercive practices such as hospitalization and forced treatment, restraint (mechanical or pharmacological), or isolation is essential.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) marks a paradigm shift in the way disability and mental illness are conceptualized. It places the person at the center of the decisions that concern him and considers individuals as holders of rights based on equality with others. Such an approach to disability has profound implications for legal capacity legislation as well as its implementation. The CRPD recognizes the challenges outlined and calls for major reforms for the promotion of human rights through a fundamental paradigm shift in the field of mental health that includes the rethinking of rules, laws, systems, and services (5). Since the adoption of the CRPD in 2006, a growing number of countries are seeking to reform their laws to promote community inclusion, dignity, self-reliance, empowerment, and recovery. At present, however, few nations have established sufficient norms to implement the epochal changes required by the international model of human rights. In many cases, existing laws perpetuate a model based on institutionalization, isolation, and coercive therapeutic practices with patients exposed to poor quality care and human rights violations. To implement the changes required by the CRPD, it is essential to improve the integrated networks of mental health services in the community through drastic changes in the methods spread in many countries.

Approximately 50 million people with mental illness live in the European Union (EU). The restriction or deprivation of legal capacity to which many of these people are subjected constitutes an obstacle to the possibility of living independently and making free decisions about life. The CRPD has become an integral part of the legal order of the signatory countries, creating legal obligations regarding the prevention of discrimination and the protection of equality. Most existing laws on legal capacity share several common features; in fact, to limit the legal capacity of an individual, the presence of an intellectual disability or a mental health problem should be associated with a second criterion connected to the "impossibility" of the person to look after his own interests.

Despite many steps forward at the international level, the protection of mental health remains an issue rarely recognized as important. Safeguarding mental health deserves greater attention from society and states to guarantee individuals the best possible care. Achieving such a goal involves investing in policies and programs aimed at the active involvement of people with mental illness; in the same way, it is crucial to keep the concepts of mental health and physical health united to be able to proceed with an adequate allocation of resources.

2.1. Italy

In 1978 the Italian mental health care system underwent a radical change with the gradual closure of all the Mental Health Hospitals. The reform developed Departments of Mental Health nationally, delivering outpatient and inpatient care, running semi-residential and residential facilities, and having small psychiatric units in general hospitals.

Law 180 established four principles: (a) a gradual phasing out of mental hospitals; (b) the establishment of general hospital psychiatric wards for acute admissions, each having a maximum of 15 beds; (c) the restriction of compulsory admissions; and (d) the setting up of community mental health centers providing psychiatric care (6, 7).

The main principle of Law 180 is that patients with mental disorders have the right to be treated the same way as patients with other diseases, which means: (a) acute mental health conditions have to be managed in psychiatric wards located in general hospitals, (b) treatments should be provided voluntarily, and compulsory admissions kept only for specific circumstances, and (c) compulsory admissions need to be formally authorized by the Mayor and can only be undertaken in general hospital psychiatric wards (8).

To defend the need for treatment against a person's will, Law 833/1978 (art. 33, 34, and 35) (9) stated that the need for compulsory admission must have an initial assessment by a medical practitioner and subsequently by a second physician belonging to the Local Health Unit. Both must confirm the presence of all the following criteria: (a) the patient shows mental changes requiring an urgent therapeutic intervention; (b) the patient does not accept the treatment; and (c) there are no conditions that provide adequate therapeutic measures outside those achievable in a hospital (10). Finally, the compulsory admission must be formally authorized by the Mayor of the municipality where the patient lives.

The Major has 48 h to complete the authorization and inform the municipality and patient of the admission. The compulsory hospital admission lasts for seven days, allowing the patient's care, promoting voluntary treatment or less restrictive forms of compulsory intervention such as non-hospitalization (11). Compulsory admission could be theoretically renewed without definite time limits on a weekly basis if allowed by the Mayor and the Judge.

Despite the promulgation in 1978 of law 180 and of law 833 ("Institution of the National Health Service"), in Italy, there has been a lack of planning for years, especially in the field of organization of services. Such a shortage was partly due to the general difficulties associated with the implementation of the National Health Service.

10.3389/fpubh.2023.1265046

Between 1994 and 1996 the reform process was reactivated, and the proposed intervention strategy provided a crucial framework to finally initiate a systematic reorganization of the services dedicated to psychiatric care. The main changes were (a) the establishment of the Department of Mental Health to guarantee unity and integration of psychiatric services within the same territory, (b) the identification of organizational components of the Department (territorial structures, hospital services, semi-residential facilities, and residential facilities), and (c) the activation of primary and secondary liaison care services. Due to ongoing uncertainties and delays by many regions, the Parliament, through repeated legislative interventions (financial laws of 1994, 1996, and 1997), introduced sanctions in the absence of operative interventions for the closure of psychiatric hospitals and the activation of mental health departments.

The Law 81/2014 outlined the closure of judicial psychiatric hospitals. The closure of judicial psychiatric hospitals, which ended in February 2017, involved their replacement with facilities called Residences for the Execution of Security Measures, with a limited number of beds in general hospitals.

2.2. England and Wales

The Mental Health Act 1983 (MHA) is the law in England and Wales under which a person with mental health problems can be admitted, detained, and treated in a hospital against their wishes (12). It tells what the people's rights are regarding assessment and treatment in hospitals, treatment in the community, and civil or criminal pathways into hospitals. The MHA has been significantly amended since its introduction.

The Mental Capacity Act (MCA) was introduced in 2005 and was amended in 2007. The MCA is a legal framework that allows actions and decisions on behalf of vulnerable individuals who lack the mental capacity for self-determination (13). The Act states that it should be assumed that every adult (over 16 years old) has the capacity to make decisions for themselves unless this can be proven otherwise; this is also known as the presumption of capacity.

The Act set out five "statutory principles." These values highlight the legal requirements in the Act (Table 1). The MHA also established the "Less Restriction" or the "least restrictive option" legal principle. Precisely, the MHA Code of Practice states: "*People taking action without a patient's consent must attempt to keep to a minimum the restrictions they impose on the patient's liberty, having regard to the purpose for which the restrictions are imposed*" (14). The code of conduct was reviewed in 2015 to encourage the least restrictive options of compulsory admission and the least duration.

Therefore, before concluding that individuals lack the capacity to make a specific decision, it is important to take all possible steps to try to help them reach a decision themselves. Individuals have the right to make decisions that others might think are unwise. Action on behalf of an incapacitated person should be in the best interest and should be the option that least restricts fundamental rights.

In England and Wales, the circumstances in which individuals lawfully can be detained in a hospital for psychiatric assessment or treatment are defined in the MHA 1983 as amended 2007. Most compulsory psychiatric admissions are authorized on the grounds given in Sections 2 and 3 of the MHA. To be able to complete and authorize an MHA assessment two medical practitioners are needed (one of whom must be a psychiatrist) and a specially trained Approved Mental Health Professional (AMHP) who is a non-medical professional (often a social worker) and agrees on the application of legal criteria for compulsory admission.

The length of time an individual can be detained in the hospital depends on the mental health condition and the circumstances of each individual:

- Section 2 authorized the detention of a patient for up to 28 days. "*The patient suffering from mental disorder of a nature or degree which warrants the detention of the patient in a hospital for assessment for at least a limited period; and is in the interests of he/she own health or safety or with a view to the protection of other*" (12).
- Section 3 authorized the detention of a patient for up to 6 months and established the possibility of renewal. "*The patient should*

TABLE 1 Comparison of the legal framework for compulsory admission between Italy and the UK.

	Italy	United Kingdom
Psychiatric hospitals	No	Yes
Psychiatric wards in general hospital	Yes	No
Community mental health team	Yes	Yes
Community mental health beds	Yes	No
Compulsory treatment regulation	Law no. 180/1978	Mental Health Act 1983 (amended in 2007)
Authorization	- Initial assessment by two medical practitioners (one of whom is part of the Local Health Unit) - The mayor can only formally authorize the admission under general hospital psychiatric wards and has 48 h to inform the patient	- Two medical practitioners (one of whom with expertise in the management of mental disorders) and a Specially trained Approved Mental Health Professional (AMHP)
Duration of the hospital restriction	- Up to 7 days - Renewable only by the ward psychiatrist on a weekly basis	- Admission for assessment (Section 2): up to 28 days - Admission for treatment (Section 3): up to 6 months (renewable)
Involvement of a judge in reviewing the case after a certain period of time.	Yes	Yes

be suffering from mental disorder of a nature or degree which makes it appropriate for him/her to receive medical treatment in a hospital; and it is necessary for the health or safety of the patient or for the protection of other persons" (12).

Once the regulatory principles have been outlined, it is easy to understand how operations cannot be separated from a careful evaluation of the clinical and legal criteria (Table 2).

The MHA in England and Wales has had several amendments since it was introduced in 1983. The Mental Health Amendment Act of 2007 proposed empowering healthcare professionals to detain, assess, and treat people with mental disorders in the interests of patient health and public safety; such a legal framework provides patients with guarantees on the appropriateness of treatments (15). In 2017 the MHA was reviewed due to concerns about rising detention rates, the disproportionate use of the Act among people from black and minority ethnic (BAME) groups, and some processes in the Act that were out of step with modern mental health system (16); it was finalised and published in December 2018. The Mental Health Bill 2022 has drafted a report with recommendations for further implementations that need to be addressed in the MHA. It states that the ability of patients to choose treatment is one of the most important measures to reduce detention and improve inequalities (17). The key reforms arising from the Bill are monitoring outcomes and cultural changes, advocating for patients and carers, speaking up about stigma, and finally, proposing to tackle inequalities in mental health services. Regarding the key changes to Section 2 (Admission for assessment) and Section 3 (Admission for treatment), it states:

- "*The new criterion requires an assessment that serious harm may be caused to the health and safety of the patient or others unless the patient is detained for assessment and treated*".
- The replacement of the current definition of "appropriate treatment" with treatment that has "a reasonable prospect of alleviating, or preventing the worsening of, the disorder or one or more of its symptoms or manifestations".

TABLE 2 Statutory principles of the Mental Capacity Act 2005.

Five statutory principles of the Mental Capacity Act 2005	1. A person must be assumed to have capacity unless is established the lack. 2. A person is not to be treated as unable to decide unless all practicable helpful steps have been taken without success. 3. A person is not to be treated as unable to decide merely because he makes an unwise decision. 4. An act performed or a decision taken under this law on behalf of an incapacitated person must be inspired by his best interest. 5. Before any act or decision, the presence of alternatives that allow the achievement of the goal in a less restrictive way of the rights and freedom of action of the person must be evaluated.

- The redefinition of "mental disorder," which not constitute a reason for detention under Article 3 without a coexisting psychiatric illness.

The Bill has raised concerns about the latest data showing racial and ethnic inequalities in compulsory hospital admission. It reports that Black or "black British" people are four times more likely to be detained than people from "any white background." The draft Bill was subject to pre-legislative scrutiny in December 2022 and published its report on 19 January 2023. The Committee supported the reform, and that the Government must strengthen the Bill to address rising detention rates and racial inequalities.

3. Epidemiological context

The implementation of the Italian reform determined a significant decline in compulsory admission from more than 20,000 in 1978 to less than 9,000 in 2015 (18). However, a different trend has been observed in some countries such as the United Kingdom where the implementation of the Mental Health Act resulted in a significant increase in compulsory admissions up to 58,400 in 2014–2015 (19).

According to the latest National Health System (20), there were 129,891 discharged adults with a diagnosis of mental disorder from Italian hospital facilities: 120,955 to primary care settings (93.1%) and 8,936 to community mental health teams (6.9%). Further. there were 5,538 compulsory treatments registered nationally in Mental Health Units, representing 7.0% of admissions to public psychiatric wards (78,950).

On the other hand, in the UK in 2020–21, 53,239 compulsory admissions were recorded, and 35,272 took place at hospital admission; additionally, 13,619 occurred following admission (20). It is estimated that the overall national totals will be higher with a likely increase in compulsory admissions of 4.5 percent from 2022.

In line with other studies and a national database, when comparing compulsory admission rates by gender, Italy and the UK show higher rates for males than females. As explained before, the latest National data in the UK reports that amongst the five broad ethnic groups, compulsory admission rates for the "Black or Black British" group (343.5 detentions per 100,000 population) were highest, compared to the White group. The "Any Other Ethnic Group" had the second highest rate of compulsory admission (502.2 admissions per 100,000 population) followed by the "Any Other Mixed Background" group (389.8 admissions per 100,000 population).

Unfortunately, there is a lack of ethnicity data in the national database regarding compulsory admission in Italy. Several studies in Italy have shown a higher rate of compulsory admission among migrants. A study conducted in a large metropolitan context demonstrated a prevalence of compulsory admissions in migrants more than double with respect to natives (23.24% versus 9.11%) (21). Another study showed that the risk of admission to a psychiatric unit is three times higher in migrants compared to non-migrants; compulsory admission among young migrants (15 to 24 years old) is four times higher. According to the same study, 20.7% of sub-Saharan Africans were admitted to psychiatric units versus 6.2% in the general population, and 17.9% of North Africans versus 8.7% in the general population (22).

4. Discussion

The principles of mental health law in different countries and the epidemiology of compulsory treatments raise concerns about patient care, treatment, and mental health services.

Interestingly in Italy, most of the information about ethnic groups and compulsory hospital admission is related to migrant studies and are not collected as part of a national database, which is more commonly seen in the British national database. The lack of ethnicity data, especially in Italy, limited our ability to understand the broader experiences of many minority communities regarding compulsory admissions. As studies have shown that compulsory admission rates are higher in migrants and minority ethnic groups, there are ongoing discussions about stigma towards mental health and ethnic inequalities in mental health services are ongoing.

Aside from ethical issues, the scientific evidence regarding compulsory treatment is currently heterogeneous. On the one hand, growing evidence demonstrates the long-term benefits of compulsory treatment with an improvement in symptoms, a reduction in suicidal ideation, relief from exacerbations of serious psychiatric illnesses and increased motivation to initiate treatment (23–25). On the other hand, compulsory treatment can damage the therapeutic alliance and reduce patient compliance with health care (26); weak therapeutic relationships can be extremely harmful for patients with psychiatric conditions. According to some authors, subjects undergoing compulsory treatment are at increased risk of coercive additional therapies and may experience anxiety or depression after discharge (27). Therefore, it is essential to conduct any compulsory treatment with a view to the safety and health of the patient. Precisely, the use of mandatory treatments must be oriented in a personalized way towards maximizing benefits and minimizing damages to protect the individual and the community (28). Although some studies highlight the clinical benefits of compulsory healthcare treatment, the lack of unambiguity of the evidence requires careful consideration of the expectations of improvement in individual cases given the compression of the fundamental rights of the individual.

Compulsory and coercive medical treatment profoundly affects the personal sphere of the individual, putting his integrity and dignity at risk. The absence of clear and uniform data makes this phenomenon difficult to analyze and monitor, particularly regarding the operating procedures carried out in the specific case. Compulsory hospitalization legislation must respect patients' fundamental rights, reduce mental health stigma, increase awareness, and address discrimination and inequalities in mental health care. The legislative activity, therefore, must guarantee the utmost attention to the protection of personal freedom and health in the interest of the person and of the community (29–31). In essence, the personalization of compulsory treatments is fundamental to confine the limitations to the strict therapeutic necessity and favor the protection of rights. Likewise, a careful balance is essential for the dignity of the person and the principle of equality. Hence, further guidance and policies in mental health and capacity legislation must be considered to arrange a more robust legal framework for patient rights. In general, legislative efforts should tend not to segregate psychiatric legislation from public health, but to conceive it as an organic part of the regulation of compulsory treatments; the elimination of distinctions in the modalities and, in part, in the places of treatment is in fact fundamental in the affirmation of the principle of equality. Compulsory treatment must be considered an exceptional event, a derogation expressly authorized and regulated to the principle of the centrality of consent. Considering voluntariness to be fundamental and the obligation of treatment to be exceptional, every path concretely useful for reaching consent must be undertaken prior to compulsory treatment. The desire to create a broad framework of sanitary, administrative, and judicial guarantees must be based on the principle according to which coercive medical treatments must not violate the limits imposed by respect for the human person and his fundamental rights. Respect for the dignity of the person directly affects the methods of carrying out compulsory treatment, requiring strict criteria for assessing the behavior of health professionals. In codifying the modalities of compulsory treatments it is necessary to ask oneself whether the right to assistance is also identified with the recovery of the ability to develop one's personality or whether it is in conflict with it; if a broad definition of health is accepted, as a state which permits an expansion of personality and intellectual resources, then the aim of treatment becomes that of recovering the capacities to exercise and enjoy the rights of the personality; in this way, the protection of the personality becomes the primary purpose of compulsory treatment, without being able to be limited anymore.

The improvement of the operating methods cannot be separated from comprehensive data collection and active surveillance of the procedures in place. The best approach to the subject must necessarily be based on a close relationship between science and law to obtain legislation that is as evidence-based as possible. To make the combination possible, the data must be of high quality, available (also through an adequate infrastructural and technological system), and monitored globally. In such an operational context, the role of scientific dissemination is crucial. The goal must be to guide the investments of time and money in political strategies oriented toward health decisions guided by the best scientific evidence available. So, monitoring the phenomenology of compulsory admission is desirable to recognize a chronological and socio-economic context; in other words, scientific activity is fundamental for orienting decisions in legal and health matters. From this perspective, the implementation of epidemiological data on compulsory hospitalization and BAME is of considerable importance to better understand social demographics and improve mental health care and patients' rights. Healthcare professionals should by now be accustomed to maintaining an Evidence-Based approach in clinical practice. However, evidence-based medicine is not unanimously recognized and accepted as the best way forward in-patient care. Scientific publishers, journals, researchers, authors, science communicators, journalists, and communicators should share virtuous training and in-depth courses, defining methods and languages of scientific communication. Only through the sharing of intent will knowledge and the correct interpretation of scientific evidence be able to guide decisions in such a delicate matter. The attention and understanding of scientific evidence are essential so that political realities and decision-makers can adequately take charge of health policies. Concerning global social inequalities, particularly in terms of health determinants and health response to evidence, the incentive for systemic change is crucial. Frequently, the constant change in socio-economic and cultural contexts favors the simultaneous dissemination of qualitatively very different evidence, making the scientific dissemination of certainties and uncertainties very difficult. The insufficiency – if not even the complete absence – of strategies to prevent or counter misinformation on issues related

to mental health and compulsory hospitalization requires the implementation of direct actions against misleading content. In light of the considerations made, not only the reliance on evidence-based medicine but also the convinced support of an evidence-based policy must be considered desirable.

Finally, it is important to consider further research, education, and multidisciplinary work aimed at continuously improving patient care and addressing racial and ethnic inequities for more culturally appropriate mental health services.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

LA: Conceptualization, Writing – original draft. MP: Conceptualization, Writing – original draft. MS: Conceptualization, Methodology, Writing – review & editing. RL: Methodology, Writing – review & editing. FM: Writing – original draft. SD'E: Methodology, Writing – review & editing. PF: Supervision, Writing – review & editing. VF: Supervision, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Griffith R, Tengnah C. Mental capacity act 2005: statutory principles and key concepts. *Br J Community Nurs*. (2008) 13:233–8. doi: 10.12968/bjcn.2008.13.5.29302

2. Carballedo A, Doyle M. Criteria for compulsory admission in some European countries. *Int Psychiatry*. (2011) 8:68–71. doi: 10.1192/S1749367600002617

3. Wasserman D, Apter G, Baeken C, Bailey S, Balazs J, Bec C, et al. Compulsory admissions of patients with mental disorders: state of the art on ethical and legislative aspects in 40 European countries. *Eur Psychiatry*. (2020) 63:e82. doi: 10.1192/j.eurpsy.2020.79

4. Salize HJ, Dressing H. Epidemiology of involuntary placement of mentally ill people across the European Union. *Br J Psychiatry*. (2004) 184:163–8. doi: 10.1192/bjp.184.2.163

5. Szmukler G, Daw R, Callard F. Mental health law and the UN convention on the rights of persons with disabilities. *Int J Law Psychiatry*. (2014) 37:245–52. doi: 10.1016/j.ijlp.2013.11.024

6. de Girolamo G, Cozza M. The Italian psychiatric reform. A 20-year perspective. *Int J Law Psychiatry*. (2000) 23:197–214. doi: 10.1016/s0160-2527(00)00030-3

7. de Girolamo G, Bassi M, Neri G, Ruggeri M, Santone G, Picardi A. The current state of mental health care in Italy: problems, perspectives, and lessons to learn. *Eur Arch Psychiatry Clin Neurosci*. (2007) 257:83–91. doi: 10.1007/s00406-006-0695-x

8. Barbui C, Papola D, Saraceno B. Forty years without mental hospitals in Italy. *Int J Ment Health Syst*. (2018) 12:43. doi: 10.1186/s13033-018-0223-1

9. Ministero della Salute. Rapporto Salute mentale. Analisi dei dati del Sistema Informativo per la Salute Mentale (SISM). Anno 2021 (2022). Available at: https://www.salute.gov.it/imgs/C_17_pubblicazioni_3282_allegato.pdf (Accessed June 15, 2023).

10. Oliva F, Ostacoli L, Versino E, Portigliatti Pomeri A, Furlan PM, Carletto S, et al. Compulsory psychiatric admissions in an Italian urban setting: are they actually compliant to the need for treatment criteria or arranged for dangerous not clinical condition? *Front Psych*. (2019) 9:740. doi: 10.3389/fpsyt.2018.00740

11. Ueberberg B, Efkemann SA, Hoffmann K, Haußleiter IS, Juckel G. The social-psychiatric service and its role in compulsory hospitalization. *Health Soc Care Community*. (2020) 28:467–74. doi: 10.1111/hsc.12879

12. Hamilton JR. Mental health act 1983. *Br Med J (Clin Res Ed)*. (1983) 286:1720–5. doi: 10.1136/bmj.286.6379.1720

13. Dimond B. The mental capacity act 2005 and decision-making: code of practice. *Br J Nurs*. (2008) 17:110–2. doi: 10.12968/bjon.2008.17.2.28138

14. Fistein EC, Clare ICH, Redley M, Holland AJ. Tensions between policy and practice: a qualitative analysis of decisions regarding compulsory admission to psychiatric hospital. *Int J Law Psychiatry*. (2016) 46:50–7. doi: 10.1016/j.ijlp.2016.02.029

15. Edquist K. EU mental health governance and citizen participation: a global governmentality perspective. *Health Econ Policy Law*. (2021) 16:38–50. doi: 10.1017/S1744133120000262

16. Beck A, Farmer P, Wykes T. Proposed reforms of the mental health act. *BMJ*. (2021) 372:n727. doi: 10.1136/bmj.n727

17. Taylor JL, Burrell C. England and Wales draft mental health bill: implications for people with intellectual disabilities. *Int J Law Psychiatry*. (2023) 87:101868. doi: 10.1016/j.ijlp.2023.101868

18. Gigantesco A, Miglio R, Santone G, de Girolamo G, Bracco R, Morosini P, et al. Process of care in general hospital psychiatric units: national survey in Italy. *Aust N Z J Psychiatry*. (2007) 41:509–18. doi: 10.1080/00048670701341921

19. Fioritti A. Is freedom (still) therapy? The 40th anniversary of the Italian mental health care reform. *Epidemiol Psychiatr Sci*. (2018) 27:319–23. doi: 10.1017/S2045796017000671

20. National Health System. Mental Health Bulletin, 2021-22 Annual report. (2022). Available at: https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-bulletin/2021-22-annual-report (Accessed June 15, 2023).

21. Del Favero E, Brasso C, Villari V, Rocca P. Corrigendum to compulsory admission: are there differences between migrants and natives? Data from a psychiatric emergency service of an Italian metropolitan area" [Heliyon 9 (3) (March 2023) Article e14406]. *Heliyon*. (2023) 9:e15785. doi: 10.1016/j.heliyon.2023.e15785

22. Tarricone I, D'Andrea G, Galatolo M, Carloni AL, Descovich C, Muratori R, et al. Psychiatric admission among migrants before and during pandemic: a retrospective study in acute psychiatric Ward in Bologna, Italy. *J Immigr Minor Health*. (2023) 25:507–21. doi: 10.1007/s10903-023-01464-7

23. Katsakou C, Priebe S. Outcomes of involuntary hospital admission--a review. *Acta Psychiatr Scand*. (2006) 114:232–41. doi: 10.1111/j.1600-0447.2006.00823.x

24. Kortrijk HE, Staring AB, van Baars AW, Mulder CL. Involuntary admission may support treatment outcome and motivation in patients receiving assertive community treatment. *Soc Psychiatry Psychiatr Epidemiol*. (2010) 45:245–52. doi: 10.1007/s00127-009-0061-1

25. Hofmann AB, Schmid HM, Hofmann LA, Noboa V, Seifritz E, Vetter S, et al. Impact of compulsory admission on treatment and outcome: a propensity score matched analysis. *Eur Psychiatry*. (2022) 65:e6. doi: 10.1192/j.eurpsy.2022.4

26. Höfer FX, Habermeyer E, Mokros A, Lau S, Gairing SK. The impact of legal coercion on the therapeutic relationship in adult schizophrenia patients. *PLoS One*. (2015) 10:e0124043. doi: 10.1371/journal.pone.0124043

27. Pandarakalam J. Formal psychiatric treatment: advantages and disadvantages. *Br J Medical Pract*. (2015) 8:37–41.

28. Freeman MC, Kolappa K, de Almeida JM, Kleinman A, Makhashvili N, Phakathi S, et al. Reversing hard won victories in the name of human rights: a critique of the general comment on article 12 of the UN convention on the rights of persons with disabilities. *Lancet Psychiatry*. (2015) 2:844–50. doi: 10.1016/S2215-0366(15)00218-7

29. Di Fazio N, Morena D, Delogu G, Volonnino G, Manetti F, Padovano M, et al. Mental health consequences of COVID-19 pandemic period in the European population: an institutional challenge. *Int J Environ Res Public Health*. (2022) 19:9347. doi: 10.3390/ijerph19159347

30. Maiese A, dell'Aquila M, Romano S, Santurro A, De Matteis A, Scopetti M, et al. Is it time for international guidelines on physical restraint in psychiatric patients? *Clin Ter*. (2019) 170:e68–70. doi: 10.7417/CT.2019.2110

31. Scopetti M, Morena D, Padovano M, Manetti F, Di Fazio N, Delogu G, et al. Assisted suicide and euthanasia in mental disorders: ethical positions in the debate between proportionality, dignity, and the right to die. *Healthcare (Basel)*. (2023) 11:1470. doi: 10.3390/healthcare11101470

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 31 October 2023
DOI 10.3389/fpubh.2023.1182441

OPEN ACCESS

EDITED BY
Julia Knopes,
Case Western Reserve University, United States

REVIEWED BY
Lina Díaz-Castro,
National Institute of Psychiatry Ramon de la Fuente Muñiz (INPRFM), Mexico
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

*CORRESPONDENCE
Guillaume B. Fond
✉ guillaume.fond@ap-hm.fr

RECEIVED 08 March 2023
ACCEPTED 21 September 2023
PUBLISHED 31 October 2023

CITATION
Fond GB, Yon DK, Tran B, Mallet J, Urbach M, Leignier S, Rey R, Misdrahi D, Llorca P-M, Schürhoff F, Berna F and Boyer L (2023) Poverty and inequality in real-world schizophrenia: a national study.
Front. Public Health 11:1182441.
doi: 10.3389/fpubh.2023.1182441

Poverty and inequality in real-world schizophrenia: a national study

Guillaume B. Fond[1,2]*, Dong Keon Yon[3,4], Bach Tran[2,5], Jasmina Mallet[1,6], Mathieu Urbach[1,7], Sylvain Leignier[1,8], Romain Rey[1,9], David Misdrahi[1,10,11], Pierre-Michel Llorca[1,12], Franck Schürhoff[1,13], Fabrice Berna[1,14] and Laurent Boyer[1,2]

[1]Fondation FondaMental, Créteil, France, [2]AP-HM, Aix-Marseille Univ, Faculté de Médecine – Secteur Timone, EA 3279: CEReSS – Centre d'Etude et de Recherche sur les Services de Santé et la Qualité de vie, Marseille, France, [3]Department of Pediatrics, Kyung Hee University College of Medicine, Seoul, Republic of Korea, [4]Center for Digital Health, Medical Science Research Institute, Kyung Hee University Medical Center, Kyung Hee University College of Medicine, Seoul, Republic of Korea, [5]Research Centre on Health Services and Quality of Life, Aix Marseille University, Marseille, France, [6]Department of Psychiatry, Université de Paris, AP-HP, Louis Mourier Hospital, INSERM UMR 1266, Paris, France, [7]Service Universitaire de Psychiatrie d'Adultes et d'Addictologie, Centre Hospitalier de Versailles, Paris, France, [8]Centre Référent de Réhabilitation Psychosociale, CH Alpes Isère, Grenoble, France, [9]INSERM U1028, CNRS UMR5292, Centre de Recherche en Neurosciences de Lyon, Université Claude Bernard Lyon 1, Equipe PSYR2, Centre Hospitalier Le Vinatier, Bron Cedex, France, [10]Pôle de Psychiatrie Générale et Universitaire, Centre Hospitalier Charles Perrens, Université de Bordeaux, Bordeaux, France, [11]CNRS UMR 5287-INCIA, Bordeaux, France, [12]Université Clermont Auvergne, CMP-B CHU, CNRS, Clermont Auvergne INP, Institut Pascal, F-63000 Clermont-Ferrand, France, [13]Université Paris Est Creteil (UPEC), AP-HP, Hôpitaux Universitaires «H. Mondor», DMU IMPACT, INSERM, IMRB, Translational Neuropsychiatry, Fondation FondaMental, Creteil, France, [14]Hôpitaux Universitaires de Strasbourg, Université de Strasbourg, INSERM U1114, Fédération de Médecine Translationnelle de Strasbourg, Strasbourg, France

Background: Schizophrenia has high socioeconomic impact among severe psychiatric disorders.

Aims: To explore clinician-reported and patient-reported inequities between patients under the poverty threshold vs. the others.

Method: 916 patients consecutively recruited in 10 national centers received a comprehensive standardized evaluation of illness severity, addictions and patient-reported outcomes.

Results: 739 (80.7%) of the patients were classified in the poverty group. This group had poorer objective illness outcomes (lower positive, negative, cognitive, excitement/aggressive and self-neglect symptoms and lifetime history of planned suicide) in multivariate analyses. While they had similar access to treatments and psychotherapy, they had lower access to socially useful activities, couple's life, housing and parenthood. They had also more disturbed metabolic parameters. On the contrary, the poverty group reported better self-esteem. No significant difference for depression, risky health behavior including addictions and sedentary behavior was found.

Interpretation: The equity in access to care is attributed to the French social system. However, mental and physical health remain poorer in these patients, and they still experience poor access to social roles independently of illness severity and despite healthcare interventions. These patients may have paradoxically better self-esteem due to decreased contact with society and therefore lower stigma exposure (especially at work). Schizophrenia presents itself as a distinct impoverished population concerning health-related outcomes and social integration, warranting focus in public health initiatives and improved treatment, including tailored interventions, collaborative care models, accessible mental

health services, housing support, vocational training and employment support, community integration, education and awareness, research and data collection, culturally competent approaches, and long-term support.

KEYWORDS

schizophrenia, psychotic disorders, mental health, poverty, inequality, public health, psychiatry, quality of life

Introduction

The 100% coverage health insurance system in France was established in 1945 after World War II to eliminate the disparities in healthcare access stemming from financial inequalities. "Inequities" refer to disparities in access to healthcare services and variations in health outcomes among patients with schizophrenia. As of now, the evidence supporting the effectiveness of social protection policies in addressing health inequalities remains limited. A majority of the published data has primarily focused on the Western systems, particularly those in the US and UK (1).

Among all severe mental disorders, schizophrenia exhibits the most pronounced connection with poverty, attributed to several clinical factors (including delusions, negative symptoms, and poor insight into illness) as well as social stigma, which hampers employment opportunities. The onset age of schizophrenia typically falls between 18 and 25 years for the majority of patients, a critical period for pursuing education and entering the workforce. As of 2021 in France, individuals unemployed due to schizophrenia can receive a disability allowance of 903 euros, while the poverty line is estimated at 1063 euros per month in the country. Moreover, all patients receive full reimbursement for pharmacological treatments (2). A recent study has revealed that schizophrenia exhibited the highest prevalence among all mental health disorders in sex workers, prisoners, and individuals with substance use disorders (3).

A study conducted within the Danish population has revealed that a low parental income was associated with an increased risk of schizophrenia onset in their offspring (4). While medico-economic studies of schizophrenia have primarily concentrated on its impact on caregivers and society, there is limited understanding regarding the influence of poverty on the clinical outcomes of the disease. Our team has published the findings of the French "Housing First" 2 years follow-up program, demonstrating that providing housing to homeless individuals with schizophrenia enhanced their access to care and subsequently improved clinical outcomes (5–8). A recent study conducted in low-to-middle-income countries has indicated that poverty was linked to positive symptoms in individuals with schizophrenia (9). While stigma is not a direct health outcome, it can influence treatment adherence and overall well-being among individuals with schizophrenia (10). In summary, while it is anticipated that individuals with more severe symptoms may experience lower income due to the disability caused by their illness, the specific clinical traits associated with poverty remain undetermined up to the present time. This also applies to their connection with various aspects of functioning, quality of life, and their access to care, including both pharmacological treatments and psychotherapy.

The FACE-SZ (FondaMental Academic Center of Expertise for Schizophrenia) cohort has been established with funding from the French Ministry of Research, aiming to create a national cohort of outpatients with schizophrenia. This cohort is still in progress and has already generated clinical recommendations aimed at enhancing the provision of mental health care for schizophrenia outpatients (11). However, the factors associated with poverty have not been explored up to this point.

The objective of this study was to identify the factors associated with poverty among the participants of FACE-SZ at the time of their enrollment in the cohort. We hypothesized that individuals with lower income would exhibit a lower education level, a higher comorbidity of substance use, more severe symptoms of illness, increased somatic comorbidities, impaired functioning, and diminished quality of life.

Population and methods

Design

This study is a cross-sectional observational study. All patients referred between January 2015 and December 2018 to the ten Schizophrenia Expert Centers located in Bordeaux, Clermont-Ferrand, Colombes, Créteil, Grenoble, Lyon, Marseille, Montpellier, Strasbourg, and Versailles[1] were consecutively included (11, 12). These expert centres cover the entire French territory. All patients were referred by their general practitioner or psychiatrist, and they received a comprehensive evaluation report along with personalized intervention recommendations.

Inclusion and exclusion criteria

The current study involved clinically stabilized patients who met the following inclusion criteria: a DSM-5 diagnosis of schizophrenia or schizoaffective disorder, and no hospitalization or alterations in treatment within the 8 weeks preceding the assessment (13).

Two skilled psychiatrists from the Schizophrenia Expert Centers network validated the diagnosis using the Structured Clinical Interview for Mental Disorders (SCID-1.0) (13).

Patients with psychiatric comorbidities, with the exception of major depression, anxiety disorders, eating disorders, and addictions,

1 www.fondation-fondamental.org

as well as those who were not proficient in French, were excluded from the study.

Collected data

Poverty group definition

In alignment with the National Institute of Statistics and Economic Studies, the monetary poverty line is defined as 60% of the median standard of living within the population. For the year 2018, this value was estimated at 1063 euros (14). The FACE-SZ dataset records monthly income as a binary variable (< or ≥1,000 euros/month), which was selected as a proxy for defining poverty when the dataset was established in 2010 (15).

Since schizophrenia typically emerges between the ages of 18 and 25, its influence on employment usually manifests early in one's professional life. Despite the cross-sectional design of our analyses, these variables were thus considered potential outcomes of poverty, with poverty serving as the explanatory variable (independent variable).

Sociodemographics and clinician-rated outcomes

Sociodemographic data were reported: age (continuous), sex (binary), and education level (academic level vs. others, binary). Clinician-rated outcomes were extracted from a comprehensive clinical battery of standardized scales for schizophrenia assessment: Clinical Global Impression scale (CGI) (16), psychotic symptomatology (PANSS total score and positive and negative factors) (continuous) (17), current depressive symptoms (Calgary score, continuous) (18) (binary), insight into illness (Birchwood total score) (continuous) (19), lifetime history of planned suicide (Interview on Suicidal Feelings/ISF) (20), (binary). All evaluators were trained in the FondaMental Schizophrenia Expert Network, with regular training sessions (at least once a year) (11).

Current functioning was evaluated using the Personal and Social Performance scale (PSP) (21), which exclusively encompasses functioning-related items with four subscores (socially useful activities, including work and study; personal and social relationships; self-care; and disturbing and aggressive behaviors). It's important to note for interpretation that PSP subscores are reversed (higher scores correspond to lower functioning) in contrast to the total score (where a higher score signifies better functioning). Additional binary sociality variables were recorded, including relationship status (being single), living arrangements (living alone), and parenthood.

Tobacco, alcohol, and cannabis use disorders were assessed utilizing the standardized expert center battery, which adheres to the DSM-5 criteria (22).

Access to treatments. The following variables were recorded: usage of second-generation antipsychotics, receiving cognitive behavioral therapy within the last 12 months (binary variables), antipsychotic daily dose calculated using the minimum effective dose method (23) and medication Adherence Rating Scale score (MARS) (24).

Caregivers reported outcomes

In certain scenarios, caregivers' assessments can prove to be more pertinent than clinician-rated evaluations (which are confined to the time of assessment and might involve patients withholding information) or patient-reported assessments (which could be influenced by mental illness and self-evaluation). When available, caregivers completed the Evaluation of Cognitive Processes involved in Disability in Schizophrenia scale (ECPDS) (25) with four domains (neurocognition, motivation, insight/awareness of one's abilities and limitations, and social cognition/communication abilities and ability to understand other people). Neurocognition evaluates the individual's cognitive abilities, such as memory, attention, problem-solving, and reasoning. It assesses how well the person can process and use information, which is often impaired in individuals with schizophrenia. Motivation assesses the person's level of motivation and engagement in daily activities. In schizophrenia, motivational deficits are common, and this domain helps gauge the extent to which motivation impacts the individual's ability to function effectively. Insight/Awareness of One's Abilities and Limitations evaluates the person's insight into their condition and their awareness of their own strengths and limitations. Individuals with schizophrenia may struggle with insight, which can affect their ability to make informed decisions about their treatment and daily life. Social Cognition/Communication Abilities and Ability to Understand Other People focuses on the individual's social and communication skills, as well as their ability to understand and interpret the intentions and emotions of others. Impairments in social cognition are common in schizophrenia and can impact social interactions and relationships. An individual with schizophrenia may experience significant memory deficits that can make it challenging for her/him to remember and follow through with daily tasks and responsibilities, such as managing medications or maintaining employment. In this case, the cognitive problems (memory deficits) are involved in the disability (difficulty in performing daily functions).

The ECPDS scale is designed to provide a comprehensive assessment of these four domains, allowing healthcare professionals to better understand the specific cognitive and functional challenges faced by individuals with schizophrenia. By assessing these areas, clinicians can tailor treatment plans and interventions to address the unique needs of each individual, ultimately improving their quality of life and functioning.

Physical health

Physical activity was self-reported by the addition of the weekly duration of moderate and intense physical activity according to the World Health Organization (26). High blood pressure and the history of coronary heart disease were extracted from medical records. Body Mass Index (BMI in kg/m^2) and abdominal circumference (in centimeters) were measured at the expert center by a trained nurse. Routine blood samples were utilized for measuring Low-Density Lipoprotein-Cholesterol (LDL-C) (g/L), High-Density Lipoprotein-Cholesterol (HDL-C) (g/L), triglyceridemia (g/L), fasting glucose (mM), high sensitivity C Reactive Protein (hs-CRP) (mg/L), and 25-hydroxy-vitamin D3 (cholecalciferol) (nM).

Patient-reported outcomes

Self-reported quality of life was assessed through a SZ-specific scale, the Schizophrenia – Quality of Life [SQoL (27)]. The SQoL has eight dimensions (physical well-being, psychological well-being, self-esteem, family relationships, friendships, sentimental life, autonomy and resilience). The inclusion of self-esteem in our analysis of inequalities stems from previous research suggesting that self-esteem can significantly impact mental health outcomes and quality of life

(28). Self-reported aggressiveness was evaluated with the Buss & Perry Aggression Questionnaire (BPAQ) (29) with 4 subscores (verbal aggressiveness, physical aggressiveness, anger and hostility).

Ethical considerations

This study adhered to ethical principles for conducting medical research involving human subjects, as stipulated in the WMA Declaration of Helsinki. The assessment protocol was approved by the pertinent ethical review board (CPP-Ile de France IX, January 18th, 2010). To safeguard participant privacy, all data were gathered anonymously. As the study involved data collected during routine care assessments, all participants signed a non-opposition form.

Statistical analysis

The study's continuous variables were presented as means and standard deviations, while categorical variables were displayed as frequency distributions. Given that the study was designed with predefined hypotheses, no correction for multiple comparisons was conducted, in accordance with the rationale provided (30). For each variable that exhibited a significant association with poverty (binary) in univariate analyses with a value of p of <0.2, a multivariate model was constructed. All models were adjusted for age, with sex (which was included in the models by default), education level, poverty, and PANSS total score (excluding the symptom variables). Data analysis was performed using SPSS 20.0 software (SPSS Inc., Chicago, IL). All statistical tests were two-tailed, with a significance level (α) set at 0.05.

Results

A total of 916 stabilized SZ outpatients (240 women and 676 men) from the FACE-SZ cohort were included in the present study. Among them, 739 (80.7%) reported a monthly income of <1,000 euros and were classified into the poverty group. The factors associated with poverty are detailed in Table 1 (clinician-rated and caregivers-rated outcomes) and Table 2 (patient-reported outcomes).

In multivariate analyses, patients without poverty demonstrated better clinician-rated outcomes compared to those with poverty across the following variables: lower current psychotic severity (adjusted beta coefficient (aB), aB = −0.12, $p < 0.001$), positive symptoms (aB = −0.10, $p = 0.007$), negative symptoms (aB = −0.11, $p = 0.002$), disorganization (aB = −0.08, $p = 0.020$), excitement (aB = −0.09, $p = 0.009$), and lifetime history of planned suicide (adjusted odds ratio (aOR) = 0.60 [0.41; 0.88], $p = 0.010$). In terms of caregivers-rated outcomes, they exhibited impaired cognitive processes involved in disability (EPHP score) (aB = 0.19, $p = 0.002$), neurocognition (aB = 0.20, $p = 0.001$), motivation (aB = 0.17, $p = 0.006$), insight (aB = 0.13, $p = 0.046$), physical aggressiveness (aB = −0.07, $p = 0.043$), clinical global impression (CGI score) (aB = −0.10, $p = 0.001$), relationship status (singleness) (aOR = 0.38 [0.23; 0.65], $p < 0.001$), independent housing (aOR = 2.85 [1.89; 4.30], $p < 0.001$), parenthood (aOR = 2.51 [1.49; 4.22], $p = 0.001$), unemployment (aOR = 0.11 [0.07, 0.18], $p < 0.001$), social functioning (aB = 0.18, $p < 0.001$), socially useful activities (aB = −0.24, $p < 0.001$), self-care (aB = −0.11, $p = 0.023$), high blood pressure (aOR = 0.49 [0.27, 0.86], $p = 0.014$), and LDL-cholesterol blood levels (aB = 0.10, $p = 0.016$). Conversely, patients with poverty reported higher self-esteem (aB = −0.08, $p = 0.039$) compared to those without poverty. No significant differences were found for addictions, treatments, treatment access, and treatment side effects (all $p > 0.05$).

Discussion

In the FACE-SZ cohort, which was nationally recruited in a high-income Western country and consisted of stabilized patients, 80% reported monthly incomes below 1,000 euros, indicating poverty. Our investigation confirmed associations between poverty and specific psychiatric outcomes, including more severe psychotic symptoms (though not depressive symptoms), aggressive behavior, singleness, limited opportunity for parenthood and independent housing, as well as impaired professional and social functioning. Moreover, poverty was linked to increased metabolic disturbances such as hypertension and high LDL-cholesterol, despite ongoing psychiatric follow-up and without discernible treatment-related differences. However, poverty did not demonstrate associations with addiction, reduced treatment adherence, decreased access to psychotherapy, or lower insight into illness.

A notable discovery from our study is the marked prevalence of poverty within the FACE-SZ cohort. However, this finding warrants careful interpretation, considering that a majority of the patients receive care within the public sector, potentially leading to the referral of more complex cases to the Expert Center. Patients with higher income might opt for private sector care, potentially contributing to an overestimation of poverty prevalence in schizophrenia within France through the FACE-SZ cohort. Nonetheless, it is worth noting that the FACE-SZ cohort effectively represents middle-aged stabilized outpatients with schizophrenia in terms of education level, age at illness onset, and comorbidities (31, 32). Importantly, although the FACE-SZ population may not provide a complete representation of the entire French population, it is crucial to note that the expert centers were not exclusively designed to support the impoverished population; rather, they were established to address the needs of all patients with diagnoses or therapeutic concerns.

The anticipated associations between poverty and low education level, unemployment, reduced engagement in socially beneficial activities, being single, and not having children were confirmed. However, it is important to highlight that poverty was not linked to decreased social functioning, heightened depression, or impaired quality of life, contrary to initial expectations. Surprisingly, individuals in poverty reported higher self-esteem levels compared to their wealthier counterparts.

The associations of poverty and biological disturbances has been described in the general population. Metabolic syndrome health disparities are believed to originate in childhood, where various factors such as genetic predisposition, early life environment, and lifestyle habits may interact to influence their development and persistence over time (33). Challenging socioeconomic environments with low resources may hinder the accumulation of a reservoir of assets, referred to as a reserve capacity, and may also induce stress, thereby depleting the existing reserves (34). The elevated risk of cardiometabolic issues in individuals with schizophrenia is often due to a combination of factors, including lifestyle factors such as poor diet

10.3389/fpubh.2023.1182441

TABLE 1 Clinician-rated and caregivers-rated factors associated with poverty in schizophrenia.

Variables	Univariate model			Multivariate model	
	Poverty *N* = 739 (80.7%)	No poverty *N* = 177 (19.3%)	Univariate *p* value	Adjusted beta coefficients or adjusted OR	Adjusted *p* value
Clinician-rated outcomes					
Sociodemographic variables, *N* or Mean (% or SD)					
Age (years)	**30.5 (9.1)**	**38.4 (9.1)**	**<0.001**		
Sex (male)	547 (74.0%)	129 (72.9%)	0.757		
Academic level	**278 (37.6%)**	**105 (59.3%)**	**<0.001**		
Current illness severity, *N* or Mean (% or SD)*					
Clinical global impression score (CGI score)*	**4.5 (1.1)**	**3.9 (1.2)**	**<0.001**	**−0.10**	**0.001**
Current psychotic severity (PANSS total score)*	**71.1 (19.6)**	**64.6 (17.1)**	**< 0.001**	**−0.12**	**<0.001**
Positive symptoms (PANSS subscore)*	**9.5 (4.5)**	**8.3 (3.9)**	**0.001**	**−0.10**	**0.007**
Negative symptoms (PANSS subscore)*	**17.5 (6.6)**	**15.5 (6.0)**	**<0.001**	**−0.11**	**0.002**
Disorganization (PANSS subscore)*	**8.1 (3.4)**	**7.2 (3.2)**	**0.001**	**−0.08**	**0.020**
Excitment (PANSS subscore)*	**5.9 (2.5)**	**5.3 (2.1)**	**0.001**	**−0.09**	**0.009**
Depressive symptoms (PANSS subscore)*	7.1 (3.2)	7.6 (3.2)	0.058	0.05	0.144
Depressive symptoms (CDSS total score)	3.9 (4.3)	4.0 (4.0)	0.687		
Planned death - Entire life* (ISF questionnaire)	**272 (37.5%)**	**52 (29.5%)**	**0.048**	**0.60 (0.41; 0.88)**	**0.010**
Insight (BIS total score)*	8.6 (3.0)	9.1 (2.9)	0.087	0.02	0.619
Caregivers-rated outcomes					
ECPDS total score*	**52.4 (14.8)**	**59.4 (12.7)**	**0.001**	**0.19**	**0.002**
Neurocognition* (ECPDS subscore)	**16.9 (5.3)**	**19.4 (4.6)**	**0.001**	**0.20**	**0.001**
Motivation* (ECPDS subscore)	**14.4 (5.6)**	**16.9 (5.0)**	**0.001**	**0.17**	**0.006**
Insight to disability* (ECPDS subscore)	**8.2 (2.7)**	**9.0 (2.3)**	**0.031**	**0.13**	**0.046**
Social cognition (ECPDS subscore)	12.9 (4.0)	13.9 (3.5)	0.092	0.11	0.084
Daily Functioning and sociality, *N* or Mean (% or SD)					
Personal and Social performance (PSP total score)	**50.7 (15.9)**	**61.5 (15.3)**	**<0.001**	**0.18**	**<0.001**
Socially useful activities (PSP subscore)	**0.8 (0.4)**	**0.5 (0.5)**	**<0.001**	**−0.24**	**<0.001**
Personal and social relationships (PSP subscore)	0.8 (0.4)	0.7 (0.5)	0.023	−0.07	0.123
Self-care (PSP subscore)	**0.3 (0.5)**	**0.2 (0.4)**	**0.011**	**−0.11**	**0.023**
Disturbing and aggressive behaviors (PSP subscore)	0.1 (0.3)	0.0 (0.1)	<0.001	−0.02	0.655
Single	**677 (93.6%)**	**134 (77.5%)**	**<0.001**	**0.38 (0.23; 0.65)**	**<0.001**
Living in her/his own housing	**247 (34.4%)**	**131 (74.4%)**	**<0.001**	**2.85 (1.89; 4.30)**	**<0.001**
Parenthood	**47 (6.4%)**	**42 (23.7%)**	**<0.001**	**2.51 (1.49; 4.22)**	**0.001**
Addictions, *N* (%)					
Current alcohol use disorder	48 (6.5%)	11 (6.2%)	0.891		
Current tobacco use disorder*	400 (56.4%)	83 (48.5%)	0.063	0.83 (0.57; 1.21)	0.340
Current cannabis use disorder*	55 (7.4%)	7 (4.0%)	0.097	0.75 (0.32; 1.79)	0.517
Access to treatments, *N* or Mean (% or SD)					
Second Generation Antipsychotics	558 (75.5%)	144 (81.4%)	0.099	1.38 (0.88; 2.17)	0.166
Cognitive Behavioral Therapy in the last 12 months	28 (3.8%)	10 (5.6%)	0.265		

(Continued)

10.3389/fpubh.2023.1182441

TABLE 1 (Continued)

Variables	Univariate model			Multivariate model	
	Poverty *N* = 739 (80.7%)	No poverty *N* = 177 (19.3%)	Univariate *p* value	Adjusted beta coefficients or adjusted OR	Adjusted *p* value
Antipsychotic daily dose (CPZ-Eq, mg/day)	538.1 (555.2)	586.7 (678.5)	0.379		
Adherence to treatment (MARS total score)	6.1 (2.2)	6.4 (2.2)	0.090	−0.01	0.722
Physical health, *N* or Mean (% or SD)					
Total physical activity level (WHO definition)	72.7 (142.0)	21.3 (47.2)	<0.001	0.00	0.996
Body Mass Index (kg/m^2)	26.2 (5.3)	26.9 (5.2)	0.113	0.01	0.853
Abdominal circumference (cm)	**94.4 (15.3)**	**97.2 (15.2)**	**0.048**	−0.01	0.899
History of coronary heart disease	2 (0.3%)	1 (0.6%)	0.475		
High Blood Pressure	**110 (17.2%)**	**18 (11.8%)**	**0.106**	**0.49 (0.27; 0.86)**	**0.014**
LDL-Cholesterol (g/L)	**3.0 (0.9)**	**3.4 (1.0)**	**<0.001**	**0.10**	**0.016**
HDL-Cholesterol (g/L)	1.3 (0.5)	1.3 (0.4)	0.363		
Triglycerides (g/L)	1.5 (1.1)	1.8 (1.6)	0.038	0.03	0.454
Blood glucose (mmol/L)	4.9 (0.9)	5.2 (1.4)	0.003	0.05	0.276
hs-CRP (mg/L)	3.3 (6.7)	3.5 (8.1)	0.745		
Cholecalciferol (nM)	44.8 (25.2)	44.7 (23.7)	0.983		

Poverty is the reference group: a beta >0 or an odds ratio >1 means that the score (or frequence) is lower in the poverty group. Associations are statistically bilateral. Poverty (no vs. yes) is here an explaining variable (independent variable). Multivariate models are therefore adjusted for age, sex and education level and PANSS total score variables for all variables except for those directly related to clinical symptomatology (*). Significant associations are in bold ($p < 0.05$). BAS, Barnes akathisia scale; BIS, Birchwood insight scale; CDSS, Calgary depression scale for schizophrenia; CGI, clinical global impression; CPZ-Eq, chlorpromazine-equivalent; ECPDS, evaluation of cognitive processes involved in disability in schizophrenia; S-QoL, schizophrenia – quality of life; hs-CRP, highly sensitive – C reactive protein; HDL, high density lipoprotein; LDL, low density lipoprotein; MARS, medication adherence rating scale; PANSS, positive and negative syndrome scale; PSP, personal and social performance scale; SAS, Simpson-Angus scale.

and physical inactivity, medication side effects, and the physiological impact of the illness itself (35).

Despite the well-established connection between poverty and an elevated risk of depression in the general population (36), our analysis did not uncover a similar correlation among the participants in our study. However, poverty was found to be correlated with a greater severity of psychotic symptoms. This finding diverges from recent research that reported a moderate association between subjective well-being and socioeconomic status in a meta-analysis of population-based studies (37).

In essence, the relationships between socio-economic status and self-esteem appear distinct in schizophrenia when compared to the general population. Firstly, this finding prompts us to reconsider the traditional assumptions about the relationship between socioeconomic factors and self-esteem. While poverty-related disempowerment might be expected to erode self-esteem, our results suggest a more complex interplay between socioeconomic status and self-perception. Delving into the underlying mechanisms that drive this counterintuitive link could yield valuable insights into how individuals with schizophrenia navigate their sense of self-worth within challenging circumstances.

Moreover, understanding why this specific association exists could have implications for designing targeted interventions. If poverty-related disempowerment is indeed tied to higher self-esteem, interventions could potentially leverage this dynamic to foster better mental well-being and quality of life among individuals facing schizophrenia and poverty. By addressing the factors that contribute to this unexpected relationship, we might uncover new avenues for promoting positive psychological outcomes in this vulnerable population. Individuals who report higher earnings are employed and, as a result, are more exposed to workplace or societal stigma in general.

Lastly, this finding underscores the importance of considering nuanced perspectives in mental health research. Schizophrenia is a complex condition with multifaceted interactions between biological, psychological, and social factors. By exploring the intricate interplay between poverty, self-esteem, and other variables, we contribute to a more comprehensive understanding of the lived experiences of individuals with schizophrenia.

Several explanations can be postulated to elucidate the disparities observed between individuals with schizophrenia and other economically disadvantaged populations. Firstly, we utilized an extremely low threshold to delineate the poverty group. Those earning between 1,000 and 1,500 euros may still grapple with financial challenges pertaining to housing and daily necessities, potentially relying on family members for financial support. This subset of individuals might be employed, encountering workplace stigma that could impact their quality of life. Our findings of diminished self-esteem among those with higher incomes align with this notion. Notably, the reduction of self-stigma only transpires when individuals are not subjected to discrimination within their employment environments (38). Socially useful activities hold significance only when they offer positive personal experiences (39, 40). The "insight paradox" (better insight impacting self-esteem) (41) is not the most

10.3389/fpubh.2023.1182441

TABLE 2 Patient-reported outcomes associated with poverty in schizophrenia.

Variables	Univariate model			Multivariate model	
	Poverty *N* = 739 (80.7%)	No poverty *N* = 177 (19.3%)	Univariate *p* value	Adjusted beta coefficients or adjusted OR	Adjusted *p* value
Patient-reported outcomes					
Quality of life					
S-QoL total score	51.7 (18.7)	50.9 (17.7)	0.610		
Physical well-being (S-QoL subscore)	45.4 (28.1)	46.1 (28.1)	0.758		
Psychological well-being (S-QoL subscore)	53.8 (27.2)	52.8 (27.4)	0.651		
Self-esteem (S-QoL subscore)	**48.7 (29.9)**	**44.0 (28.9)**	**0.061**	**−0.08**	**0.039**
Family relationships (S-QoL subscore)	69.5 (25.9)	67.5 (26.3)	0.382		
Friendships (S-QoL subscore)	48.7 (29.8)	48.5 (27.2)	0.946		
Sentimental life (S-QoL subscore)	34.1 (29.6)	33.6 (31.3)	0.848		
Autonomy (S-QoL subscore)	59.4 (27.5)	57.7 (27.3)	0.483		
Resilience (S-QoL subscore)	54.9 (27.5)	57.1 (25.0)	0.319		
Self-reported aggressiveness (BPAQ scale)					
Verbal aggressiveness (BPAQ subscore)	12.6 (3.9)	12.4 (3.8)	0.521		
Physical aggressiveness (BPAQ subscore)	**20.3 (7.6)**	**17.1 (6.3)**	**<0.001**	**−0.07**	**0.043**
Anger (BPAQ subscore)	17.2 (5.9)	15.9 (5.3)	0.006	−0.04	0.353
Hostility (BPAQ subscore)	22.1 (6.7)	22.4 (6.9)	0.653		

Poverty is the reference group: a beta >0 or an odds ratio >1 means that the score (or frequence) is lower in the poverty group. Associations are statistically bilateral. Poverty is here an explaining variable (independent variable). Multivariate models are therefore adjusted for age, sex and education level and PANSS total score. Significant associations are in bold ($p < 0.05$).

plausible explanation, as we observed no significant difference in insight between the poverty and non-poverty groups.

Likewise, no disparity between the groups was found in terms of addictions, treatments, and treatment side effects, implying that France's comprehensive 100% health insurance coverage effectively mitigates healthcare inequalities. Hence, treatments and addictions are unlikely to account for these differences.

The heightened prevalence of depression in individuals with schizophrenia, three times greater than in the general population (42), could elucidate why both groups exhibit comparable levels of depression. Depression in schizophrenia might be influenced by distinct etiological factors than those in the general population, with a heightened role of biological factors and reduced influence of socio-environmental factors.

It's important to emphasize that patients facing poverty exhibited no variations in treatments' access (pharmacological treatment or psychotherapy). In France, treatments for schizophrenia are fully reimbursed, and psychotherapy can be accessed freely within the realm of public mental health facilities.

Indeed, the observation that individuals with schizophrenia constitute a distinct impoverished population in terms of health-related outcomes and social integration has important implications for public health programs. To expand on this, we can identify several specific areas where our findings can guide targeted interventions:

- Tailored Support Services: given the unique challenges faced by individuals with schizophrenia in terms of health outcomes and social inclusion, public health programs could develop tailored support services. These services might encompass specialized mental health interventions that address the nuanced needs of this population, while also considering the influence of poverty-related disempowerment on self-esteem.
- Employment and Stigma Mitigation: as we discussed earlier, individuals reporting higher incomes might experience increased exposure to stigma, especially in work settings. Building on this insight, public health programs could focus on providing job-related support, anti-stigma campaigns, and workplace accommodations to minimize the potential negative impact of stigma on both self-esteem and mental well-being.
- Comprehensive Mental Health Care: our study underscores the complex relationship between poverty, mental health, and social functioning. Public health initiatives could concentrate on ensuring comprehensive mental health care that not only addresses clinical symptoms but also recognizes the broader socioeconomic factors influencing the lives of individuals with schizophrenia.
- Holistic Interventions: by acknowledging the paradoxical association between poverty-related disempowerment and self-esteem, public health programs can adopt a more holistic approach to intervention. This might involve integrating social empowerment strategies into mental health care, aiming to boost self-esteem while addressing the unique challenges posed by poverty.
- Collaboration and Advocacy: engaging stakeholders across multiple sectors, including mental health, social services, employment, and education, can enhance the impact of public

health programs. Collaborative efforts and advocacy campaigns can work towards destigmatization, improved access to resources, and fostering social inclusion for individuals with schizophrenia.

Limits

In this study, poverty was considered as a circumstance preceding the expert center evaluation. We opted to examine factors associated with poverty at enrollment in an initial cross-sectional investigation. A trajectory study, delving into the impact of poverty on FACE-SZ follow-up trajectories, is planned for the future, contingent on the accrual of sufficient follow-up data in the FACE-SZ dataset.

The FACE-SZ cohort did not encompass the participants' early socioeconomic circumstances, including parental income during childhood, number of siblings, monoparental households, and the current financial status of the patients' caregivers. The lifelong progression of symptomatology, particularly persistent primary negative symptoms that might influence functional trajectories, could not be captured due to memory biases and the challenges of retrospectively exploring negative symptoms. Our findings were adjusted by factoring in education level, often considered a surrogate for family socioeconomic status.

Strengths

The adjustment for age, sex, education level, and psychotic symptomatology represents a robust aspect of the current findings. Consequently, the relationships between poverty and functioning cannot be entirely attributed to sociodemographic factors or illness severity. The validity of our results is fortified by the comprehensive national-level recruitment across numerous centers, yielding a substantial sample size. It is worth noting that the correlation between poverty and unfavorable clinical outcomes is unlikely to be solely explicable by limited opportunity for studies or merely by heightened symptom severity.

Conclusion

More than 8 out of 10 schizophrenia patients live below the poverty threshold. Despite equitable access to care, individuals experiencing mental and physical health challenges continue to fare worse, with limited opportunity for social roles although not to social functioning. Paradoxically, poverty-related disempowerment might be linked to elevated self-esteem. Thus, schizophrenia emerges as a distinct population grappling with health-related outcomes and social integration, warranting attention in public health initiatives.

Data availability statement

The raw data will be made available on reasonable to the authors.

Ethics statement

The studies involving humans were approved by CPP-Ile de France IX, January 18th, 2010. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

LB and GF: concept and design, interpretation of data, drafting of the manuscript, and supervision. GF, DY, BT, JM, MU, SL, RR, DM, P-ML, FS, FB, and LB: acquisition and critical revision of the manuscript for important intellectual content. LB: statistical analysis. All authors contributed to the article and approved the submitted version.

Funding

This work was funded by Hôpitaux Universitaires de Marseille (AP-HM).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Hillier-Brown F, Thomson K, Mcgowan V, Cairns J, Eikemo TA, Gil-Gonzále D, et al. The effects of social protection policies on health inequalities: evidence from systematic reviews. *Scand J Public Health*. (2019) 47:655–65. doi: 10.1177/1403494819848276

2. Laidi C, Prigent A, Plas A, Leboyer M, Fond G, Chevreul K, et al. Factors associated with direct health care costs in schizophrenia: results from the FACE-SZ French dataset. *Eur Neuropsychopharmacol J Eur Coll Neuropsychopharmacol.* (2018) 28:24–36. doi: 10.1016/j.euroneuro.2017.11.020

3. Aldridge RW, Story A, Hwang SW, Nordentoft M, Luchenski SA, Hartwell G, et al. Morbidity and mortality in homeless individuals, prisoners, sex workers, and individuals with substance use disorders in high-income countries: a systematic review and meta-analysis. *Lancet Lond Engl.* (2018) 391:241–50. doi: 10.1016/S0140-6736(17)31869-X

4. Hakulinen WRT, Pedersen CB, et al. Association between parental income during childhood and risk of schizophrenia later in life. *JAMA Psychiatry*. (2020) 77:17–24. doi: 10.1001/jamapsychiatry.2019.2299

5. Fond G, Tinland A, Boucekine M, Girard V, Loubière S, Boyer L, et al. Improving the treatment and remission of major depression in homeless people with severe mental illness: the multicentric French housing first (FHF) program. *Prog Neuro-Psychopharmacol Biol Psychiatry*. (2020) 99:109877. doi: 10.1016/j.pnpbp.2020.109877

6. Fond G, Boyer L, Boucekine M, Girard V, Loubière S, Lenoir C, et al. Illness and drug modifiable factors associated with violent behavior in homeless people with severe mental illness: results from the French housing first (FHF) program. *Prog Neuro-Psychopharmacol Biol Psychiatry*. (2019) 90:92–6. doi: 10.1016/j.pnpbp.2018.11.006

7. Fond G, Tinland A, Boucekine M, et al. Prescription of potentially inappropriate psychotropic drugs in homeless people with schizophrenia and bipolar disorders. Results from the French Housing First (FHF) program. *Prog Neuropsychopharmacol Biol Psychiatry*. (2018) 8:24. doi: 10.1016/j.pnpbp.2018.08.024

8. Tinland A, Loubière S, Boucekine M, Boyer L, Fond G, Girard V, et al. Effectiveness of a housing support team intervention with a recovery-oriented approach on hospital and emergency department use by homeless people with severe mental illness: a randomised controlled trial. *Epidemiol Psychiatr Sci*. (2020) 29:e169. doi: 10.1017/S2045796020000785

9. Crossley NA, Zugman A, Reyes-Madrigal F, Czepielewski LS, Castro MN, Diaz-Zuluaga AM, et al. Structural brain abnormalities in schizophrenia in adverse environments: examining the effect of poverty and violence in six Latin American cities. *Br J Psychiatry J Ment Sci*. (2021) 218:112–8. doi: 10.1192/bjp.2020.143

10. Tesfaw G, Kibru B, Ayano G. Prevalence and factors associated with higher levels of perceived stigma among people with schizophrenia Addis Ababa. *Ethiopia Int J Ment Health Syst*. (2020) 14:19. doi: 10.1186/s13033-020-00348-9

11. Fond G, Godin O, Schürhoff F, Berna F, André M, Aouizerate B, et al. Confirmations, advances and recommendations for the daily care of schizophrenia based on the French national FACE-SZ cohort. *Prog Neuro-Psychopharmacol Biol Psychiatry*. (2020) 101:109927. doi: 10.1016/j.pnpbp.2020.109927

12. Schürhoff F, Fond G, Berna F, Bulzacka E, Godin O, Boyer L, et al. The 10-year findings from the Fonda mental academic Center of Expertise for schizophrenia (FACE-SZ): review and recommendations for clinical practice. *L'Encephale*. (2019) 45:9–14. doi: 10.1016/j.encep.2018.07.007

13. APA-The Structured Clinical Interview for DSM-5®. Available at: https://www.appi.org/products/structured-clinical-interview-for-dsm-5-scid-5. Accessed 9 April, 2021

14. INSEE (2021) *Seuil de pauvreté en France*

15. Schürhoff F, Fond G, Berna F, Bulzacka E, Vilain J, Capdevielle D, et al. A national network of schizophrenia expert centres: an innovative tool to bridge the research-practice gap. *Eur Psychiatry J Assoc Eur Psychiatr*. (2015) 30:728–35. doi: 10.1016/j.eurpsy.2015.05.004

16. Guy W (1976) *ECDEU assessment manual for psychopharmacology. U.S. Department of Health, education, and welfare, public health service, alcohol, drug abuse, and mental health administration, National Institute of Mental Health, psychopharmacology research branch, division of extramural research programs*

17. Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophr Bull*. (1987) 13:261–76. doi: 10.1093/schbul/13.2.261

18. Addington, D, Addington, J, and Maticka-Tyndale, E. Assessing depression in schizophrenia: the Calgary Depression Scale. *Br J Psychiatry Suppl*. (1993). 22:39–44.

19. Birchwood M, Smith J, Drury V, Healy J, Macmillan F, Slade M. A self-report insight scale for psychosis: reliability, validity and sensitivity to change. *Acta Psychiatr Scand*. (1994) 89:62–7. doi: 10.1111/j.1600-0447.1994.tb01487.x

20. Paykel ES, Myers JK, Lindenthal JJ, Tanner J. Suicidal feelings in the general population: a prevalence study. *Br J Psychiatry J Ment Sci*. (1974) 124:460–9. doi: 10.1192/bjp.124.5.460

21. Morosini PL, Magliano L, Brambilla L, Ugolini S, Pioli R. Development, reliability and acceptability of a new version of the DSM-IV social and occupational functioning assessment scale (SOFAS) to assess routine social functioning. *Acta Psychiatr Scand*. (2000) 101:323–9. doi: 10.1111/j.1600-0447.2000.tb10933.x

22. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed (2013).

23. Leucht S, Samara M, Heres S, Patel MX, Woods SW, Davis JM. Dose equivalents for second-generation antipsychotics: the minimum effective dose method. *Schizophr Bull*. (2014) 40:314–26. doi: 10.1093/schbul/sbu001

24. Fond G, Boyer L, Boucekine M, Aden LA, Schürhoff F, Tessier A, et al. Validation study of the medication adherence rating scale. Results from the FACE-SZ national dataset. *Schizophr Res*. (2017) 182:84–9. doi: 10.1016/j.schres.2016.10.023

25. Passerieux C, Bulot V, Hardy-Baylé M-C, Roux P. Assessing cognitive-related disability in schizophrenia: reliability, validity and underlying factors of the evaluation of cognitive processes involved in disability in schizophrenia scale. *Disabil Rehabil*. (2018) 40:1953–9. doi: 10.1080/09638288.2017.1312568

26. Bull FC, Al-Ansari SS, Biddle S, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med*. (2020) 54:1451–62. doi: 10.1136/bjsports-2020-102955

27. Boyer L, Simeoni M-C, Loundou A, D'Amato T, Reine G, Lancon C, et al. The development of the S-QoL 18: a shortened quality of life questionnaire for patients with schizophrenia. *Schizophr Res*. (2010) 121:241–50. doi: 10.1016/j.schres.2010.05.019

28. Henriksen IO, Ranøyen I, Indredavik MS, Stenseng F. The role of self-esteem in the development of psychiatric problems: a three-year prospective study in a clinical sample of adolescents. *Child Adolesc Psychiatry Ment Health*. (2017) 11:68. doi: 10.1186/s13034-017-0207-y

29. Buss AH, Perry M. The aggression questionnaire. *J Pers Soc Psychol*. (1992) 63:452–9. doi: 10.1037//0022-3514.63.3.452

30. Bender R, Lange S. Adjusting for multiple testing—when and how? *J Clin Epidemiol*. (2001) 54:343–9. doi: 10.1016/S0895-4356(00)00314-0

31. Godin O, Fond G, Bulzacka E, Schürhoff F, Boyer L, Myrtille A, et al. Validation and refinement of the clinical staging model in a French cohort of outpatient with schizophrenia (FACE-SZ). *Prog Neuro-Psychopharmacol Biol Psychiatry*. (2019) 92:226–34. doi: 10.1016/j.pnpbp.2019.01.003

32. Fond BL, Berna F, et al. Remission of depression in patients with schizophrenia and comorbid major depressive disorder: results from the FACE-SZ cohort. *Br J Psychiatry J Ment Sci*. (2018) 213:464–70. doi: 10.1192/bjp.2018.87

33. Hostinar CE, Ross KM, Chen E, Miller GE. Early-life socioeconomic disadvantage and metabolic health disparities. *Psychosom Med*. (2017) 79:514–23. doi: 10.1097/PSY.0000000000000455

34. Matthews KA, Räikkönen K, Gallo L, Kuller LH. Association between socioeconomic status and metabolic syndrome in women: testing the reserve capacity model. *Health Psychol Off J Div Health Psychol Am Psychol Assoc*. (2008) 27:576–83. doi: 10.1037/0278-6133.27.5.576

35. Pearl RL, Wadden TA, Hopkins CM, Shaw JA, Hayes MR, Bakizada ZM, et al. Association between weight bias internalization and metabolic syndrome among treatment-seeking individuals with obesity. *Obesity*. (2017) 25:317–22. doi: 10.1002/oby.21716

36. Lorant V, Deliège D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: a meta-analysis. *Am J Epidemiol*. (2003) 157:98–112. doi: 10.1093/aje/kwf182

37. Tan JJX, Kraus MW, Carpenter NC, Adler NE. The association between objective and subjective socioeconomic status and subjective well-being: a meta-analytic review. *Psychol Bull*. (2020) 146:970–1020. doi: 10.1037/bul0000258

38. Rüsch N, Nordt C, Kawohl W, Brantschen E, Bärtsch B, Müller M, et al. Work-related discrimination and change in self-stigma among people with mental illness during supported employment. *Psychiatr Serv Wash DC*. (2014) 65:1496–8. doi: 10.1176/appi.ps.201400073

39. Dubreucq J, Plasse J, Franck N. Self-stigma in serious mental illness: a systematic review of frequency, correlates, and consequences. *Schizophr Bull sbaa*. (2021) 47:1261–87. doi: 10.1093/schbul/sbaa181

40. Dubreucq M, Plasse J, Gabayet F, Blanc O, Chereau I, Cervello S, et al. Sex differences in recovery-related outcomes and needs for psychiatric rehabilitation in people with schizophrenia Spectrum disorder. *J Clin Psychiatry*. (2021) 82:20m13732. doi: 10.4088/JCP.20m13732

41. Davis BJ, Lysaker PH, Salyers MP, Minor KS. The insight paradox in schizophrenia: a meta-analysis of the relationship between clinical insight and quality of life. *Schizophr Res*. (2020) 223:9–17. doi: 10.1016/j.schres.2020.07.017

42. Etchecopar-Etchart D, Korchia T, Loundou A, Llorca PM, Auquier P, Lançon C, et al. Comorbid major depressive disorder in schizophrenia: a systematic review and Meta-analysis. *Schizophr Bull*. (2020) 47:298–308. doi: 10.1093/schbul/sbaa153

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 08 November 2023
DOI 10.3389/fpubh.2023.1282662

OPEN ACCESS

EDITED BY
Julia Knopes,
Case Western Reserve University, United States

REVIEWED BY
Jeremy Hilton,
Cranfield University, United Kingdom
Eric Richardson,
United States Department of Veterans Affairs, United States

*CORRESPONDENCE
Salvador Camacho
✉ salvador.camacho@swisstph.ch

RECEIVED 24 August 2023
ACCEPTED 25 October 2023
PUBLISHED 08 November 2023

CITATION
Camacho S, Hilber AM, Ospina-Pinillos L, Sánchez-Nítola M, Shambo-Rodríguez DL, Lee GY and Occhipinti J-A (2023) Can participatory processes lead to changes in the configuration of local mental health networks? A social network analysis.
Front. Public Health 11:1282662.
doi: 10.3389/fpubh.2023.1282662

Can participatory processes lead to changes in the configuration of local mental health networks? A social network analysis

Salvador Camacho[1,2]*, Adriane Martin Hilber[1,2], Laura Ospina-Pinillos[3], Mónica Sánchez-Nítola[3], Débora L. Shambo-Rodríguez[3], Grace Yeeun Lee[4] and Jo-An Occhipinti[4,5]

[1]Swiss Centre for International Health, Swiss Tropical and Public Health Institute, Basel, Switzerland, [2]University of Basel, Basel, Switzerland, [3]Department of Psychiatry and Mental Health, School of Medicine, Pontificia Universidad Javeriana, Bogota, Colombia, [4]Brain and Mind Centre, The University of Sydney, Sydney, NSW, Australia, [5]Computer Simulation and Advanced Research Technologies, Sydney, NSW, Australia

Systems modeling offers a valuable tool to support strategic decision-making for complex problems because it considers the causal inter-relationships that drive population health outcomes. This tool can be used to simulate policies and initiatives to determine which combinations are likely to deliver the greatest impacts and returns on investment. Systems modeling benefits from participatory approaches where a multidisciplinary stakeholder group actively engages in mapping and contextualizing causal mechanisms driving complex system behaviors. Such approaches can have significant advantages, including that they may improve connection and coordination of the network of stakeholders operating across the system; however, these are often observed in practice as colloquial anecdotes and seldom formally assessed. We used a basic social network analysis to explore the impact on the configuration of the network of mental health providers, decision-makers, and other stakeholders in Bogota, Colombia active in a series of three workshops throughout 2021 and 2022. Overall, our analysis suggests that the participatory process of the systems dynamics exercise impacts the social network's structure, relationships, and dynamics.

KEYWORDS

adolescents, young people, mental health, social network analysis, system dynamics modeling, participatory systems modeling, health system, Colombia

1. Introduction

The use of systems models offers a valuable instrument to support strategic decision-making for complex problems. A system model is a tool that can be used to understand the complex causal inter-relationships that drive population mental health outcomes and can simulate policies and initiatives (individually or in combination) to determine which are likely to deliver the best outcomes and returns on investment in youth mental health (1). Systems modeling benefits from participatory approaches where a group of stakeholders with diverse areas of expertise working across the system of interest, actively engages in mapping and contextualizing causal mechanisms driving complex system behaviors (2). This process is also referred to as

participatory systems modeling (PSM). In the case of Bogota, Colombia, the result of the PSM was a computerized dynamic model of the local mental health system.

Involvement of stakeholders in the model-building process is particularly important in mental health, as it offers the opportunity to obtain the diverse perspectives of those working in and/or trying to navigate the system, including young people with lived (or living) experience of mental illness. This brings care providers and care receivers together into a joint process of learning and problem solving to strengthen the youth mental health system. Low-and middle-income countries (LMICs) have wider gaps in the adoption of evidence-based information to inform decision-making (3). Despite the uptake of decision support tools in high income countries, LMICs still struggle to implement and use these tools to inform policy (4). The reasons are multiple and complex; certainly the availability of local systems modeling expertise, and the perceived lack of quantity and quality of data act as barriers to uptake of these tools. Other possible explanations include that decision makers may not yet be familiarized with these tools, may not trust them, or their use is not part of their routine practices, and most importantly, they may not understand their value (3, 5). Hence, the participatory process of coming together with a broad range of stakeholders working across the youth mental health system provides a platform for joint questioning, learning, and trust building that may deliver positive benefits for the structure and coherence of the social network.

This process is reported to have several benefits such as improved model credibility, utility, and a robust basis for policy and planning dialogues which can lead to organized, evidence-informed decision making, and active advocacy (6). However, the impact of participatory process is commonly focused on participant engagement, their value obtained from the exercise as well as the products resulting from the process (2, 7–9). Even though some frameworks look at partnerships as a result of the interaction inside the PSM (8), these frameworks do not consider the impact of the partnerships into the whole network. Therefore, there is a paucity of evidence of the impact of PSM on professional networks, e.g., generating more connections, coordination and communication across the actors that form the network that we aim to cover with a Social Network Analysis (SNA). SNA provides a method for measuring changes in the network before and after participation in the collaborative model building process.

Colombia is an upper middle-income country with 48 million inhabitants. It has also been recognized as the most decentralized country in Latin America (10). Its health system is complex where multiple actors play diverse roles and their degree of influence over public policy also varies. For example, the Ministry of Health and Social Protection acts at a central level to create policy, but the Local Health Departments have the autonomy to enact the policy and to implement programs according to the local needs. Health system funding also has an interplay of multiple sectors (11) such as the subsidized (public), contributive (private), and special regimes (e.g., army or police) where insurers ("Entidades Administradoras de Planes de Beneficios de Salud, EAPB in Spanish) and health provider institutions are the main actors. Academia, scientific societies, non-governmental organizations (NGOs) and the civilian society to a lesser extent also contribute to influence policy.

As Koon et al. (3) postulated, the likelihood of novel information to inform public policy relies on the institution/organization's reputation, capacity, quality and quantity of connections to decision-makers and others. Considering this, the present study aimed to detect changes in the social network as a result of the participatory process, which could result in positive outcomes such as facilitating the dialogue between stakeholders and consequently knowledge exchange and improved system coherence. This SNA also allowed us to explore the perceived roles of the stakeholders within a youth mental health professional network in Bogota, Colombia, e.g., to identify which actor is the most influential or which one has the most connections.

2. Materials and methods

This study explores the impact of participatory systems modeling on a youth mental health professional network in Bogota, Colombia. It was part of a broader program of research implemented in 2021–2022. The broader research program aimed to develop a system dynamics model that can be used as a decision-support tool for strategic planning and investments in youth mental health and suicide prevention in Bogota. The research program is a collaborative international endeavor between CSART (international), The University of Sydney (Australia), the Swiss Tropical and Public Health Institute (Switzerland), and Pontificia Universidad Javeriana (Colombia) in collaboration with a broad range of stakeholders in Bogota. It was anticipated that the modeling would inform policymaking on the selection of strategies and services needed to strengthen the youth mental health system and mitigate the social and economic drivers of youth mental health outcomes, e.g., the prevalence of youth mental health problems, emergency department presentations, and youth suicide, in Bogota, including the exacerbation of these outcomes due to the COVID-19 pandemic.

2.1. Approach

The project employed a participatory approach in the development of the system dynamics model following a similar participatory modeling approach conducted in Australia by the Brain and Mind Centre, University of Sydney[1] (2). As in Australia, a collaboration between researchers, health policymakers, clinicians, and community actors in the local mental health system engaged in a participatory process to define system components, pathways, barriers, and the most critical interventions that could make an impact on suicidality, and overall mental health and wellbeing in Bogota's youth.

A participatory process in system modeling includes actively involving stakeholders, such as experts, decision-makers, and affected community members, in various stages of the modeling process. It seeks to include diverse perspectives and knowledge to ensure a comprehensive and collaborative approach to understanding and addressing complex systems. A broad overview of the participatory system modeling process is as follows:

a) Stakeholder Engagement: Stakeholders are identified and invited to participate in the modeling process. They may

1 https://www.rightcarefirsttimewhereyoulive.com.au/

include experts from different domains, policymakers, community representatives, and other relevant parties.

b) Problem Definition: Stakeholders work together to define the problem or issue that the system modeling aims to address. This ensures that the modeling effort is aligned with the concerns and priorities of all involved parties.
c) Data Collection and Validation: Stakeholders contribute their expertise and knowledge to collect and validate data used in the modeling process. Their insights help ensure that the data accurately represents the real-world system being modeled. Both qualitative (interviews and surveys) and quantitative (surveys, existing datasets, etc.) data are collected. Stakeholders review the data in a validation workshop to ensure accuracy.
d) Model Co-creation: Stakeholders collaborate with modelers to develop the system model. They actively contribute their insights, assumptions, and feedback throughout the modeling process in an iterative process.
e) Scenario Development: Participating stakeholders are involved in generating and exploring different scenarios within the model. These scenarios can represent potential interventions, policy changes, or other strategies to address the identified problem.
f) Model Interpretation and Policy Insights: Stakeholders engage in interpreting model results and drawing policy insights guided by the facilitators of the workshop. Their diverse perspectives can lead to a deeper understanding of the system's behavior and the potential impacts of different interventions.
g) Decision-making and Implementation: Participatory modeling aims to inform decision-making processes. Policymakers and stakeholders use the model results and insights to make informed choices and implement effective strategies.

By involving stakeholders throughout the system modeling process, participatory modeling fosters transparency, ownership, and collective learning. It enhances the credibility and relevance of the model's outcomes and ensures that the modeling effort serves the interests and needs of the people affected by the system under study. This is achieved by providing a safe environment where participants are able to contribute without been judged, there are no right or wrong answers, they hear the participants' opinions and as such they can also reflect on the mental health network and the relevance of them in their work. In addition, by hearing each other concerns, expertise, contribution and efforts, participants also got a basis to reflect in the importance of communication and collaborative work.

2.2. Evaluating networks in participatory systems modeling

The participatory process was conducted with a multidisciplinary group of stakeholders through three workshops. The participants were purposefully selected from the local Bogota youth mental health system and included a diversity of policymakers, providers at all levels of care, community representatives, representatives across broader health and social systems (e.g., education sector, health sector), special interest groups, civil society, young people with lived experience of mental illness, and caregivers of young people with lived experience. The SNA was part of a broader multi-scale and comprehensive evaluation approach that was employed in Bogota following a similar evaluation process conducted in Australia (12, 13). The results of the broader evaluation will be reported elsewhere, with this paper focused only on the SNA component as a complementary tool to provide insights that otherwise would be missed.

2.3. Social network analysis

We followed the stakeholders' views and perceptions of their network, before, during, and after the series of modeling workshops to explore how the participatory process affected participants' perspectives and collaboration/connection within the Bogota youth mental health network. Since we could not identify a validated survey to be applied to our needs, we followed the process suggested by Monaghan et al. (14) of using data from questionnaires and semi-structured interviews. Therefore, we used the information collected via an online survey and virtual interviews. Following Monaghan et al. (14), the data from the online survey was used to map the network and the linkages between the members of the network and the virtual interviews were used to understand the context of some of the answers of the online survey. We aimed to understand the linkages between stakeholder services and interests, their current relationships, and ways of working before and after the series of workshops. We were interested in potential changes in stakeholders' perceptions about their existing network dynamics and relationships, e.g., changing their perceptions of potential partnerships and collaborations with other members of the network to improving mental health care for young people in Bogota.

To determine the impact of the PSM on the local social network of mental health, we used a basic SNA, which is a quantitative method that uses graph theory and sociograms to analyze and visualize social relationships, where nodes represent the actors, and lines represent their relationships (15). Therefore, we examined workshop participants' social networks and the effects that participating in the workshops had on these networks, specifically on existing relationships. The SNA was performed to (*i*) map the stakeholders involved, the way they are linked, assess the influence of the actors, and determine the structure of the network; and (*ii*) how these former characteristics change after the participatory activities. All research activities were approved by the Institutional Ethics Committee of the Pontificia Universidad Javeriana (protocol number 2020/039) and participants provided their informed consent to take part in the study.

2.4. Participant sampling

Stakeholders were recruited to attend three participatory modeling workshops between the September 2021 and March 2022, which coincided with the COVID-19 pandemic. This imposed several restrictions that required adaption of the usual conduct of workshops. For example, each workshop was undertaken as several smaller workshops over the course of a week rather than as one large workshop on a single day—due to social distancing requirements and constraints on room capacity—which might or might not have restricted the ability of all stakeholders to engage with each other. Purposive sampling was used to identify and recruit participants for the SNA within the range of expertise needed. The participants selected from

TABLE 1 Questions in survey related to SNA.

1. Does your organization collaborate with the following stakeholders because it is obliged to do so (e.g., because it is required to do so by a protocol, law, regulation)? Options: list of stakeholders' category plus yes, no, or no relation.
2. Please indicate how close you are, in the work you do for your organization, with the following institutions. Consider issues of confidentiality, reliability, among others. Options: list of stakeholders' category plus scale 0 (no relation) to 5 (very close)
3. Please evaluate the type of relationship your organization has with the following actors. Administrative/legal relationship: For example, one party imposes monitoring and control mechanisms, performance criteria and/or requests information; and the other party complies with them, renders accounts/reports and/or must request authorizations for its actions. Implementation relationship: For example, the organizations work together on programs, events or campaigns. Research relationship: For example, organizations collaborate to carry out knowledge production processes. Options: list of stakeholders' category plus administrative, implementation, legal, or non-applicable.
4. Please evaluate the frequency with which your organization interacts with the following stakeholders. Options: list of stakeholders' category plus regularly, occasional, rarely, or non-applicable.

Bogota were representative of the diversity of stakeholders in the system.

2.5. Data collection and analysis

Shortly after recruitment, the participants were interviewed using a semi-structured interview guide to capture initial impressions and perceptions before their engagement in the participatory process. They were also requested to complete a survey before the first workshop and following the third workshop. The survey questionnaire complemented the interviews by asking similar questions to validate the qualitative data; but the survey, however, contained additional question modules to collect social network data from the stakeholders before and after the participatory workshops. The survey was created using the REDCap software and distributed using a digital link sent by email or instant messaging apps to all the participants before the first workshop (baseline), and after the third and final workshop (end line). The respondents could fill out the survey either in advance of their participation or at the start/end of the workshop. The surveys and interviews contained several questions that served the broader evaluation and are reported somewhere else. The survey's specific module on SNA contained questions to find out to whom each of the represented organizations was connected, what kind of professional relationship or link they may have, i.e., administrative, implementation or research, and the frequency of the interaction between the linked organizations (see Table 1).

The data collected through the surveys before the first workshop and after the third workshop was analyzed to detect changes in the connections or structural patterns measured. Only those participants that attended all three workshops were considered in the analysis to reduce the risk of confounders and increase the attribution likelihood to the workshop (16).

A network was defined as a number of nodes that are connected by interrelations called links. In SNA, the nodes are people or institutions and the links are any social connection between them. For this SNA, the nodes are persons and institutions represented at the workshops. We assessed relationships between nodes using different measures, the most basic being the number of contacts between two nodes, called "tie strength" (17). We also measured the key nodes—"network centrality"—using different aspects of centrality (18). For example, the nodes that receive the most links (*indegree centrality*), i.e., the nodes with whom most of the other nodes have an interaction with, the nodes that send the most links (*outdegree centrality*), i.e., the nodes that have the most interactions with other nodes, and the distance between nodes measured by their links (*degree centrality*) (19). We also assessed the approximate importance of each node using a measure called *Eigenvector*, which looks at the number of links a node has to other nodes in the network and how well connected those other nodes are through the network (*Eigenvector centrality*) (20). The complete set of used measures is explained in Table 2.

In the survey, we asked the participants to identify the group that they were representing and to indicate the relationship that their organization has with other stakeholders within the network. As shown in Table 3, we also asked them to grade the "closeness" of their contact or relationship to the other stakeholders with whom they maintain a link, the type of link (e.g., research, implementation, or legal), and the frequency of their contact (very often to rarely). As other studies focused on SNA impacts (21–25), we analyzed the survey data using Kumu (Jeff and Ryan Mohr, web-based open source, version 2022 available at https://kumu.io). Kumu is an online system mapping tool and visualization platform for mapping systems and relationships that facilitates quantitative analysis using the metrics shown in Table 2.

3. Results

A total of 78 stakeholders were recruited to attend three participatory modeling workshops. The initial workshop was attended by 57 participants; the second workshop by 42; and the third workshop by 54. However, for this analysis, only the participants that attended all three workshops and answered both pre and post surveys were considered in the analysis ($n = 24$). The considered participants represented 11 stakeholder group categories (see Table 3) and 32 nodes were identified. This discrepancy between nodes and number of participants is due to several participants representing more than one institution. The list of the nodes and the groups they represent are in Table 3. A full list of the stakeholder categories is provided in Table 4.

We used the general network metrics (Table 2 and Supplementary Appendix) in both baseline and end line to describe the general characteristics of the network and created two graphic depictions based on these metrics, i.e., at a baseline and end line,

TABLE 2 Metrics used for the social network analysis.

Metric	Description
Degree	Degree centrality is the simplest of the centrality metrics, counting the number of connections an element has. In general, elements with high *degree* are the local connectors/hubs, but aren't necessarily the best connected to the wider network.
Closeness centrality	Closeness measures the distance each element is from all other elements. In general, elements with high closeness can spread information to the rest of the network most easily and usually have a good overview of what is happening across the network.
Betweenness centrality	Betweenness centrality measures how many times an element lies on the shortest path between two other elements. In general, elements with high betweenness have more control over the flow of information and act as key bridges within the network. They can also be potential single points of failure.
Size	Size measures the number of neighbors an element has (plus the element itself). It's similar to degree, but counts the number of elements instead of connections.
Indegree	Indegree measures the number of incoming connections for an element. In general, elements with high Indegree are leaders, looked to by others as a source of advice, expertise, or information.
Outdegree	Outdegree measures the number of outgoing connections for an element. In general, elements with high outdegree can reach a high number of elements and spark the flow of information across a network (but may not be the most efficient at spreading the information).
Eigenvector	Like other centrality measures, Eigenvector measures how well connected an element is to other well connected elements. That is, it measures a node's influence based on the number of links it has to other nodes in the network, but also taking into account how well connected that node is, and how many links their connections have. In general, elements with high eigenvector centrality are the leaders of the network, though they may not have the strongest local influence.
Reach (two-step out)	Reach measures the portion of the network within two steps of an element. In general, elements with high reach can spread information through the network through close friend-of-a-friend contacts.
Reach efficiency	Reach efficiency normalizes reach by dividing it by size (number of neighbors). In general, elements with high reach efficiency are less connected but gain more exposure through each direct relationship.
MICMAC	MICMAC is a system analysis that explores element exposure (how much a given element is affected by other elements) and influence (how much a given element affects other elements). When plotted on an XY axis, these scores help you identify potential leverage points within the overall system.
Density	How many links between nodes exist compared to how many links between nodes are possible
Reciprocity	The likelihood of nodes in the network to be mutually linked
Diameter	The length of the longest path between two nodes
Avg. degree	The average number of links per node in the network
Avg. path length	The average number of steps along the shortest paths for all possible pairs of network nodes

TABLE 3 Workshop stakeholders' categories, broken down according to youth mental health sectors engaged.

Categories of stakeholders represented in the workshops	Number of institutions represented during the 3 workshops (n = 32)
Policy Makers, Health Department, and Local Health District representatives	4
Youth Mental Health Academics, Social Scientists and Epidemiologists	4
Mental Health Clinicians	4
Health providers	5
Insurance reps/Health Benefit Plan Management Companies	1
Primary Care, GPs, and Allied Health Professionals	1
Child Protection representatives	2
Consumers/People with lived experience/carers	2
Education sector representatives (e.g., counselors, Education Department)	4
Non-Governmental Organizations (NGOs)	1
Representatives from special interest groups	4

shown in Figures 1A,B, correspondingly. For example, the node with the most connections indicates a main actor. In the same tenor, a node that is connected indirectly to most of the other nodes suggests an influential actor. By looking at these basic measures both before and after the workshops, we aimed to identify changes in the roles of the nodes if it was the case. These findings can help

10.3389/fpubh.2023.1282662

TABLE 4 32 nodes and the groups they represent in the network.

Node name	Group representing
1. Centre for Research on Youth Mental Health	Mental Health Clinicians
2. Children and Adolescent Protection Institute	Child Protection representatives
3. Colombian Association of Bipolars	Young people, consumers, people with lived experience, and carers
4. Colombian Association of People with Schizophrenia and their Families	Young people, consumers, people with lived experience, and carers
5. Colombian Occupational Therapy Association	Primary Care, GPs, and Allied Health Professionals
6. Colombian Psychiatric Association	Mental Health Clinicians
7. Corporación Nuevos Rumbos	Youth Mental Health Academics, Social Scientists and Epidemiologists
8. Education District Department	Education sector representatives (e.g., counselors, Education Department);
9. Emergency Services or Police	Policy Makers, Health Department, and Local Health District representatives
10. Emmanuel Clinic	Health providers
11. Foundation/NGO	NGO
12. Health District Department	Policy Makers, Health Department, and Local Health District representatives
13. Hermanas Hospitalarias del Sagrado Corazón de Jesús	Health providers
14. Insurance representatives/Health Benefit Plan Management Companies	Insurance companies
15. Javesalud	Health providers
16. Ministry of Health	Policy Makers, Health Department, and Local Health District representatives
17. National Health Observatory	Youth Mental Health Academics, Social Scientists and Epidemiologists
18. Online Provider of youth mental health services	Health providers
19. Organizations of people with lived experience/carers	Special interest groups representatives (e.g., armed conflict victims, LGBTIQ+)
20. Other District Department	Policy Makers, Health Department, and Local Health District representatives
21. Provider of youth mental health services	Health providers
22. Psychology Consultants, Pontificia Universidad Javeriana	Mental Health Clinicians
23. Public Health Institute, Pontificia Universidad Javeriana	Youth Mental Health Academics, Social Scientists and Epidemiologists
24. Public organization for the protection of children and adolescents	Child Protection representatives
25. School of Medicine, Pontificia Universidad Javeriana	Youth Mental Health Academics, Social Scientists and Epidemiologists
26. School of Psychology, Pontificia Universidad Javeriana	Mental Health Clinicians
27. Social or community organization	Special interest groups representatives (e.g., armed conflict victims, LGBTIQ+)
28. Spiritual or religious organization	Special interest groups representatives (e.g., armed conflict victims, LGBTIQ+)
29. Stonewall Student Group	Special interest groups representatives (e.g., armed conflict victims, LGBTIQ+)
30. Universidad de los Andes	Education sector representatives (e.g., counselors, Education Department)
31. University counseling and psychological services, Universidad de los Andes	Education sector representatives (e.g., counselors, Education Department)
32. University counseling and psychological services, Universidad Javeriana	Education sector representatives (e.g., counselors, Education Department)

to describe a specific value obtained from the participatory process that may be overlooked by other evaluation methodologies. The values of the measurements of the whole network and their differences (baseline vs. end line) are shown in Table 5 showing no variation in the number of elements and the diameter of the network at baseline and end line suggesting a rigid network. Considerable changes were shown in the number of connections (decreasing from baseline to end line) and the average degree of the network (also decreasing from baseline to end line) suggesting changes in the role of some of the nodes.

Our SNA detected 2 main actors measured by the number of connections they have (degree centrality), namely the Bogota's Health District Department (HDD) and the Ministry of Health and Social Protection (MoH), which did not change from baseline to end line (Figures 1A,B). Both organizations' high centrality is a result of being identified by multiple respondents as the stakeholders with the most contacts. The circle size in Figures 1A,B is proportional to stakeholder centrality relative to the rest of the network and hence identifies the most connected stakeholders. According to our SNA, the network consists of only a single community, dominated by the HDD and the MoH based on their relative centrality value. This community did not change after the workshops.

In the dimension of closeness centrality, the MoH and the HDD remained as the dominating actors, before and after the workshops, both of which can easily spread information to the rest of the network and hence have high visibility. This holds also for betweenness centrality, denoting high control over the flow of information within

10.3389/fpubh.2023.1282662

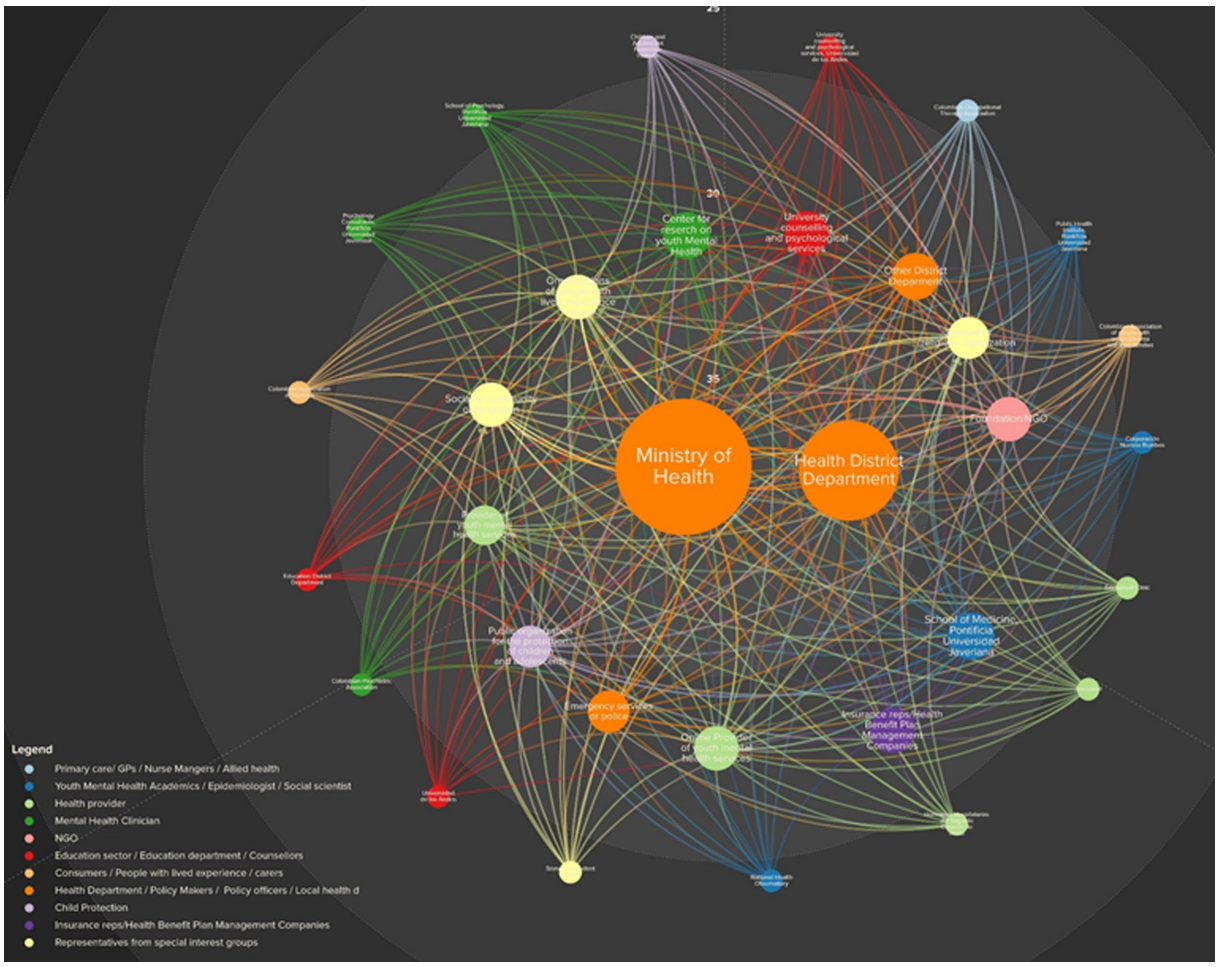


FIGURE 1
(A) Baseline social network structure for mental health in Bogota, Colombia. The circles represent stakeholders (nodes) and the links are the lines connecting two stakeholders. The node size is proportional to the node's degree and the node color was coded according to the type of group they belong to. SNA measures: 32 elements, 321 connections, 0.64 density, 0.97 reciprocity, 3 diameter, 19.91 avg. degree, and 1.45 avg. path length. **(B)** End line social network structure for mental health in Bogota, Colombia. The circles represent stakeholders (nodes) and the links are the lines connecting two stakeholders. The node size is proportional to the node's degree and the node color was coded according to the type of group they belong to. SNA measures: 32 elements, 308 connections, 0.57 density, 0.82 reciprocity, 3 diameter, 19.13 avg. degree, and 1.52 avg. path length.

TABLE 5 General network metrics.

Metrics	Baseline	End line	Difference
Elements	32	32	0
Connections	321	308	−13
Density	0.64	0.57	−0.07
Reciprocity	0.97	0.82	−0.15
Diameter	3	3	0
Avg. degree	19.91	19.13	−0.78
Avg. path length	1.45	1.52	0.07

the network from these two nodes. This aligns with the fact that both organizations also rank highest in outdegree (number of outgoing connections) and indegree (number of incoming connections) connections before and after the workshops. Both MoH and HDD are the leaders of the network (although not necessarily the only local influencers) according to their eigenvector centrality values (see Supplementary Appendix).

The reach efficiency measure shows the nodes less connected that gain exposure through each direct relationship. This measurement showed a change of nodes from the baseline to the end line (see Figures 1A,B and Supplementary Appendix). As per the MICMAC Cross Impact Analysis (26) in both exposure (how much a given element is affected by other elements) and influence (how much a given element affects other elements) the dominant actors also changed substantially as shown in Table 5. Regarding the size measure, i.e., the number of neighbors an element has plus the element itself, there were 12 changes from baseline to end line, and the reach measure, i.e., the portion of the network within two steps of an element, underwent seven changes. These measures are shown in Tables 5, 6 and the remaining measures are shown in Supplementary Appendix.

10.3389/fpubh.2023.1282662

TABLE 6 Stakeholders changes in MICMAC measures at baseline and end line.

Baseline		Endline	
Value	Stakeholder	Value	Stakeholder
MICMAC Exposure			
1	Ministry of Health	1	Universidad de los Andes
1	Health District Department	0.76	Ministry of Health
0.72	Children and Adolescent Protection Institute	0.68	Colombian Association of people with schizophrenia and their families
0.56	Center for research on youth Mental Health	0.68	Javesalud
0.56	Organizations of people with lived experience/carers	0.68	National Health Observatory
MICMAC influence			
Value	Stakeholder	Value	Stakeholder
1	Children and Adolescent Protection Institute	1	Ministry of Health
1	School of Medicine, Pontificia Universidad Javeriana	0.80	Social or community organization
1	Colombian Association of Bipolars	0.77	Health District Department
1	Colombian Occupational Therapy Association	0.67	Other District Department
1	Colombian Psychiatric Association	0.65	Insurance reps/Health Benefit Plan Management Companies

The MICMAC Exposure measures how much a given element is affected by other elements; whereas MICMAC influence measures how much a given element affects other elements. For both measures a higher value means higher affectation or higher degree of affectation. The value range is 0 (min) to 1 (max).

4. Discussion

Using a SNA to identify characteristics of a given network such as its most important actors, the most influential ones, and the visibility of others within the network, can be informative in understanding and leveraging social networks in the implementation of decisions made on the basis of the systems modeling tool. This study aimed to detect the impact of a participatory modeling approach on the youth mental health stakeholder network in Bogota, Colombia and contribute to the evidence on this topic. The findings suggest that the use of SNA can be an important tool to understand the change over time in a professional network and the role and influence of stakeholders within it after a PSM. For example, similar to a physical network, a social network has an intrinsic level of rigidity, which is the degree of resistance to change or deformation in its structure (27, 28). Rigidity level provides an overview of several aspects such as, e.g., how easily a network can be modified or how inflexible it can be. The level of rigidity can be influenced by factors such as the number of connections between nodes, the strength of those connections, and the diversity of nodes in the network (28).

Our findings demonstrated that in Bogota, the network's general measures, such as the number of connections, density, reciprocity, and average degree diminished from the baseline to the end line indicating small changes within the network and the role its members play as a result of the participatory process. These findings suggest that indeed, the participatory process had an impact on the network.

The most important changes were:

Connections: The number of connections in the network decreased from 321 at baseline to 308 at endline. This indicates that some connections were lost or dissolved during the intervention period.

Density: The network density decreased from 0.64 at baseline to 0.57 at endline. The decrease in density suggests that the network became less connected or more fragmented over time.

Reciprocity: Reciprocity measures the proportion of mutual connections in the network. It decreased from 0.97 at baseline to 0.82 at endline. This indicates that fewer connections were mutual, and there was a decrease in the level of reciprocity in the network.

Diameter: The diameter remained constant at 3 for both baseline and endline, indicating that the overall reach of the network did not change significantly.

Average Degree: The average degree slightly decreased from 19.91 at baseline to 19.13 at endline. The average degree represents the average number of connections each node has in the network. The decrease in average degree suggests that, on average, each node had *slightly* fewer connections at the endline compared to baseline.

Average Path Length: The average path length increased from 1.45 at baseline to 1.52 at endline. The increase in average path length indicates that the network became *slightly* less efficient in terms of communication and information flow between nodes in relation to the network's original structure.

Changes in MICMAC Exposure:

At baseline, the Ministry of Health and Health Department had the highest exposure values (both at 1), indicating that they were significantly affected by other nodes in the network.

At endline, the Universidad de los Andes and the Ministry of Health had the highest exposure values, suggesting a shift in the nodes that were most influenced or affected by others.

Changes in MICMAC Influence:

At baseline, several nodes had a high influence value of 1, including the National Health Observatory, School of Medicine, and others. This indicates that these nodes were influential in shaping the network's dynamics.

At endline, the Ministry of Health, Social or community organization, Health District Department, and other entities emerged as influential nodes.

These findings impacted the network in the following ways:

Structural Changes: The decrease in the number of connections, density, and reciprocity, as well as the increase in average path length, suggest that the network became less cohesive and potentially less effective in information exchange and collaboration between nodes.

Shift in Influence: The changes in MICMAC influence reveal a shift in influential nodes within the network. At baseline, certain organizations, such as the National Health Observatory and School of Medicine, held significant influence. However, at endline, the Ministry of Health and other entities emerged as more influential, e.g., Insurance representatives (see Table 4).

Impact of the PSM: The participatory process likely led to changes in the network's composition and dynamics. Some nodes may have gained or lost influence, resulting in alterations in the network's structure and connections.

Role of Health Institutions: The high exposure values of the Ministry of Health and the Health Department at both baseline and endline indicate their crucial role as key nodes significantly affected by other entities in the network.

It may be that the most important stakeholders were consolidated during the workshops, causing less important stakeholders to "disappear" from the network, explaining the decrease in the connections and reciprocity in the whole network. However, other small yet important changes may have also taken place since the average path length in the network was a bit larger after the workshops, i.e., a "larger" path for all possible pairs of network nodes, suggesting a repositioning of certain stakeholders, moving further away.

For Bogota, the SNA measures not surprisingly showed the public health organizations as the most dominant within the mental health network, i.e., Ministry of Health and Health District Department, leading the number of connections and the flow of information. Indeed, as a policy-making institution, the MoH has a key influence in the mental health system. The measures that underwent the fewest changes between baseline and end line were reach and size, whereas the measures with the most changes were betweenness, eigenvector, and MICMAC influence.

Since reach and size are measures related to the structure of the network, the few changes may suggest that the network is quite rigid and not prone to change its structure easily. These findings also provide a hint that intersectoral collaboration may not be in place despite being currently encouraged by the local laws. However, the fact that measures related to influencing stakeholders presented so many changes before and after the workshops suggests that indeed, the workshops may have altered the perceived role of certain stakeholders. The participatory nature of the workshop may have facilitated contact and understanding of the multiple actors within the system, and thus changed the perception of some stakeholders within the "universe of actors" in the system. For example, according to the MICMAC influence, the Children and Adolescent Protection Institute was among the most influential stakeholders with a value of 1 at the baseline but was ranked among the least influential after the workshops, having an end value of 0. In contrast, the emergency services or police passed from a not influential value of 0 to one of the most influential ones, with a value of 0.96. Observations and discussions during the workshops about the role of emergency services may have changed the stakeholders' perceptions of these services by the last workshop. We recognize it may be true that some of these results could be explained by the priming effects induced by the nature of the workshops, i.e., focused on youth mental health and participation (29). However, in this case this seems unlikely since there were also non-health related sectors represented in the workshops and other topics may have been more salient in some workshops, such as computational modeling.

Overall, the analysis suggests that the PSM had an impact on the social network's structure, relationships, and dynamics. The shift in influential nodes and changes in connections and reciprocity indicate potential changes in the network's effectiveness and ability to coordinate health-related activities. However, further investigation and qualitative analysis are required to understand the specific reasons behind these changes and the implications for the intervention's objectives and outcomes at a larger term since, e.g., the possible loss in efficiency and cohesiveness captured by the SNA maybe a transitory phase toward a more efficient one.

In addition to the insights gained from the current study, SNA could offer a robust framework for future intervention development and implementation. The results of an SNA allows for targeted interventions by identifying key nodes or actors within the network who are most influential in specific aspects of a given intervention, thereby optimizing resource allocation. For example, by identifying the network member that can easily spread information an awareness campaign in mental health problems could be more effective if this member is involved in the design and implementation of the campaign. Moreover, SNA can be employed in the initial stages of intervention planning to conduct a comprehensive needs assessment, thereby ensuring that the intervention is tailored to the specific characteristics and needs of the network. The methodology also lends itself to the creation of an implementation map, pinpointing key stakeholders who are crucial at various stages of intervention rollout. Post-implementation, SNA can be a complementary tool for evaluating the impact of the intervention on network structure, offering quantitative metrics that can inform iterative improvements. Thus, SNA not only enhances our understanding of the current network dynamics but also provides actionable insights for the design, implementation, and evaluation of future interventions.

4.1. Limitations

A limitation of our study is that we sought to undertake only a basic SNA analysis leaving out some other aspects that could also have provided greater insights into how and why the participant network changed. This decision was made on the basis of not overburdening participants given their participation in the participatory modeling workshops as well as the broader evaluation with quantitative and qualitative components. However, the method used did answer the primary research question by being able to detect changes in the social network as a result of the participatory process. This demonstrates the value and feasibility of the approach as part of an evaluation framework for future applications of participatory systems modeling (13). Another limitation could have been the restrictions imposed as a result of the COVID-19 pandemic requiring the research team to divide each larger workshop into several sub-workshops. However, this could have had two possible and opposite consequences: *i*) Domination of groups of people preventing all the stakeholders from interacting with each other, or *ii*) increase of interaction due to being able to interact in smaller groups. Related to this, the compulsory wearing of masks may also have acted as a barrier to the development of interpersonal relationships that are important for networking.

Finally, some participants attended the workshops on behalf of two or three different organizations, therefore, the answers to some questions from this type of participants could have been a mixture of perceptions of all the organizations that they represented and/or being a dominant perception by one of the organizations they represented.

5. Conclusion

Insights provided by this SNA suggest that the participatory approach to systems modeling can impact the relationships between stakeholders and organizations that provide mental health services to young people. The insights from an SNA can assist with identifying the ideal actors within the network, e.g., most influential ones, to distribute information, support initiatives, and foster collective action to improve the mental health system, which in turn can assist decision makers and program designers to form more efficient partnerships in the aftermath of a PSM. The information provided by an SNA can be combined with other insights in available from more traditional evaluation tools applied to participatory processes, e.g., qualitative insights, such as stakeholder interviews and observational notes, to provide additional context for network structures and relationships supporting the co-generation of local and scientific knowledge and cooperation between scientists and decision-makers.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

SC: Conceptualization, Formal analysis, Methodology, Writing – original draft. AH: Writing – review & editing. LO-P: Writing – review & editing. MS-N: Investigation, Project administration, Writing – review & editing. DS-R: Data curation, Investigation, Validation, Writing – review & editing. GL: Writing – review & editing. J-AO: Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This research was carried in its totality thanks to a grant from Fondation Botnar (REG-19-026).

Acknowledgments

The authors would like to thank Fondation Botnar, all the persons that participated in the modeling workshops, the organizations that they represented, and the staff of the Pontificia Universidad Javeriana. Special thanks to the community workers and young people with lived experience of mental illness that enriched the methodology with their participation. We would also like to thank Alexandra Morales for the assistance in the project.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2023.1282662/full#supplementary-material

References

1. Occhipinti J-A, Skinner A, Freebairn L, Song YJC, Ho N, Lawson K, et al. Which social, economic, and health sector strategies will deliver the greatest impacts for youth mental health and suicide prevention? Protocol for an advanced, systems modelling approach. *Front Psych*. (2021) 12:12. doi: 10.3389/fpsyt.2021.759343

2. Freebairn L, Occhipinti JA, Song YJC, Skinner A, Lawson K, Lee GY, et al. Participatory methods for systems modeling of youth mental health: implementation protocol. *JMIR Res Protoc*. (2022) 11:e32988. doi: 10.2196/32988

3. Koon AD, Rao KD, Tran NT, Ghaffar A. Embedding health policy and systems research into decision-making processes in low- and middle-income countries. *Health Res Policy Syst*. (2013) 11:30. doi: 10.1186/1478-4505-11-30

4. Horwood C, Luthuli S, Mapumulo S, Haskins L, Jensen C, Pansegrouw D, et al. Challenges of using e-health technologies to support clinical care in rural Africa: a longitudinal mixed methods study exploring primary health care nurses' experiences of using an electronic clinical decision support system (CDSS) in South Africa. *BMC Health Serv Res*. (2023) 23:30. doi: 10.1186/s12913-022-09001-2

5. Mera M, González C, López DM. Towards an intelligent decision support system for public health surveillance - a qualitative analysis of information needs. *Stud Health Technol Inform*. (2014) 202:44–7.

6. Atkinson J-A, Wells R, Page A, Dominello A, Haines M, Wilson A. Applications of system dynamics modelling to support health policy. *Public Health Res Pract*. (2015) 25:e2531531. doi: 10.17061/phrp2531531

7. Freebairn L, Rychetnik L, Atkinson J-A, Kelly P, McDonnell G, Roberts N, et al. Knowledge mobilisation for policy development: implementing systems approaches through participatory dynamic simulation modelling. *Health Res. Policy Syst*. (2017) 15:83. doi: 10.1186/s12961-017-0245-1

8. Freebairn L, Atkinson J-A, Osgood ND, Kelly PM, McDonnell G, Rychetnik L. Turning conceptual systems maps into dynamic simulation models: an Australian case study for diabetes in pregnancy. *PLoS One*. (2019) 14:e0218875. doi: 10.1371/journal.pone.0218875

9. Freebairn L, Atkinson J, Kelly P, McDonnell G, Rychetnik L. Simulation modelling as a tool for knowledge mobilisation in health policy settings: a case study protocol. *Health Res Policy Syst*. (2016) 14:71. doi: 10.1186/s12961-016-0143-y

10. OECD. *Asymmetric decentralisation: policy implications in Colombia* Secretary-General of the OECD (2019).

11. Gaviria A, Medina C, Mejía C, McKenzie D, Soares RR. Assessing health reform in Colombia: from theory to practice [with comments]. *Economía*. (2006) 7:29–72. doi: 10.1353/eco.2007.0006

12. Lee GY, Hickie IB, Occhipinti J-A, Song YJC, Camacho S, Skinner A, et al. Participatory systems modelling for youth mental health: an evaluation study applying a comprehensive multi-scale framework. *Int J Environ Res Public Health*. (2022) 19:4015. doi: 10.3390/ijerph19074015

13. Lee GY, Hickie IB, Occhipinti J-A, Song YJC, Skinner A, Camacho S, et al. Presenting a comprehensive multi-scale evaluation framework for participatory modelling programs: a scoping review. *PLoS One*. (2022) 17:e0266125. doi: 10.1371/journal.pone.0266125

14. Monaghan S, Lavelle J, Gunnigle P. Mapping networks: exploring the utility of social network analysis in management research and practice. *J Bus Res*. (2017) 76:136–44. doi: 10.1016/j.jbusres.2017.03.020

15. Krupa M, Cenek M, Powell J, Trammell EJ. Mapping the stakeholders: using social network analysis to increase the legitimacy and transparency of participatory scenario planning. *Soc Nat Resour*. (2018) 31:136–41. doi: 10.1080/08941920.2017.1376140

16. Schröter B, Hauck J, Hackenberg I, Matzdorf B. Bringing transparency into the process: social network analysis as a tool to support the participatory design and implementation process of payments for ecosystem services. *Ecosyst Serv*. (2018) 34:206–17. doi: 10.1016/j.ecoser.2018.03.007

17. Mattie H, Engø-Monsen K, Ling R, Onnela J-P. Understanding tie strength in social networks using a local bow tie framework. *Sci Rep*. (2018) 8:1–9. doi: 10.1038/s41598-018-27290-8

18. Das K, Samanta S, Pal M. Study on centrality measures in social networks: a survey. *Soc Netw Anal Min*. (2018) 8:13. doi: 10.1007/s13278-018-0493-2

19. Srinivas A, Velusamy RL, editors. Identification of influential nodes from social networks based on enhanced degree centrality measure. 2015 IEEE International Advance Computing Conference (IACC) (2015).

20. Bonacich P. Some unique properties of eigenvector centrality. *Soc Netw*. (2007) 29:555–64. doi: 10.1016/j.socnet.2007.04.002

21. Mwapwele S, Marais M, Dlamini S, Biljon JV, editors. ICT support environment in developing countries: the multiple cases of school teachers in rural South Africa. 2019 IST-Africa week conference (IST-Africa) (2019), 8–10.

22. Davies M, Calma A. Australasian journal of philosophy 1947–2016: a retrospective using citation and social network analyses. *Glob Intellect Hist*. (2019) 4:181–203. doi: 10.1080/23801883.2018.1478233

23. Forbes M. *Digital teaching: mapping networks across Avant-Garde magazines*. Not Even Past: Blog. (2017).

24. Patmisari E, McLaren H, Jones M. Socio-developmental network analysis: establishing a research method to examine socio-contextual dynamics of children in the mockingbird FamilyTM. *Soc Sci*. (2023) 12:129. doi: 10.3390/socsci12030129

25. Balbone A, Sieza Y, Naboho N. *Coming together? Social network analysis of humanitarian actors in Burkina Faso*. The humanitarian leader. 2022: Working paper 024 (2022).

26. Villacorta PJ, Masegosa AD, Castellanos D, Lamata MT. A new fuzzy linguistic approach to qualitative cross impact analysis. *Appl Soft Comput*. (2014) 24:19–30. doi: 10.1016/j.asoc.2014.06.025

27. Papadopoulos L, Porter MA, Daniels KE, Bassett DS. Network analysis of particles and grains. *J Compl Netw*. (2018) 6:485–565. doi: 10.1093/comnet/cny005

28. Ghali N, Panda M, Hassanien AE, Abraham A, Snasel V. Social networks analysis: tools, measures and visualization In: A Abraham, editor. *Computational social networks: Mining and visualization*. London: London: Springer (2012). 3–23.

29. Friedman RS, Fishbach A, Förster J, Werth L. Attentional priming effects on creativity. *Creat Res J*. (2003) 15:277–86. doi: 10.1207/S15326934CRJ152&3_18

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 30 January 2024
DOI 10.3389/fpubh.2024.1278901

OPEN ACCESS

EDITED BY
Lexi White,
WellStar Health System, United States

REVIEWED BY
Dai Su,
Capital Medical University, China
Gigi Lam,
Hong Kong Shue Yan University,
Hong Kong SAR, China

*CORRESPONDENCE
Guilin Liu
guilinliu88@163.com
Jinghui Zhu
zhujh@wmu.edu.cn

RECEIVED 17 August 2023
ACCEPTED 10 January 2024
PUBLISHED 30 January 2024

CITATION
Fu D, Wang F, Gao B, Bai Q, Liu G and Zhu J (2024) The influence of different sources of anticipated instrumental support on depressive symptoms in older adults. *Front. Public Health* 12:1278901. doi: 10.3389/fpubh.2024.1278901

The influence of different sources of anticipated instrumental support on depressive symptoms in older adults

Duanduan Fu, Fang Wang, Baizhi Gao, Qin Bai, Guilin Liu* and Jinghui Zhu*

School of Public Health and Management, Wenzhou Medical University, Wenzhou, China

Objective: This study investigated how anticipated instrumental support sources and intergenerational support influence depressive symptoms in older Chinese adults.

Methods: We employed binary logistic regression on data from 7,117 adults aged ≥60 in the 2018 China Health and Retirement Longitudinal Study, controlling for gender, marital status, and self-rated health.

Results: 38.89% of respondents exhibited depressive symptoms. Anticipated support from spouse and children, spouse only, children only, or other sources showed 52, 25, 46, and 40% lower odds of depression, respectively, compared with no anticipated support. Those providing financial support had 36% higher odds of depression than those without exchanges. However, those receiving financial support, receiving instrumental support, and receiving and providing financial and emotional support had 19, 14, 23, and 24% lower odds of depression.

Conclusion: Different anticipated instrumental support sources and intergenerational support influenced depression odds in older adults, suggesting potential benefits in promoting such support systems.

KEYWORDS

anticipated instrumental support, intergenerational support, depressive symptoms, older adults, China Health and Retirement Longitudinal Study

Introduction

Depression is a significant mental health concern that is prevalent among older populations worldwide. The World Health Organization has indicated that, globally, 15% of older individuals experience some form of mental illness, with depression notably prevalent (1). Particularly in low- and middle-income nations, the magnitude of this issue is pronounced. For instance, depression rates soared to 34.4 and 36.9% among the older populations of India and Bangladesh, respectively (2, 3); far higher than the world average. China also experiences heightened prevalence, with studies noting that 20% of its older population grapples with depression (4). Distressingly, this rate escalates to 40.7% when considering older individuals in rural areas (5). The implications of depression in later life stages are profound: it can induce appetite and weight changes, disruptions in sleep patterns, and feelings of diminished self-worth or undue guilt (6). These manifestations can further compound risks of conditions such

as obesity, diabetes, and even severe outcomes such as suicide, disability, or mortality (7–10). Thus, addressing depression among older individuals is an imperative public health priority.

As China's population ages, the demand for caregiving services for older adults also increases (11). However, caregiving by relatives is being weakened due to factors such as changes in family structure, rapid urbanization, and increased labor mobility (12, 13). Research has found that over 30% of older adult's caregiving needs are not being met, and 41.67% of older adults have anticipated instrumental needs (14). In addition, as people age, they might encounter various health challenges. For example, frailty, urinary incontinence and an increased risk of falling, etc. (15). In such circumstances, receiving timely instrumental support becomes crucial, as without it the health of older adults may be seriously threatened. Hence, the assurance of anticipating instrumental support, or "anticipated instrumental support," is significant for them.

Chinese families have always attached great importance to the relationship between upbringing and support, and the filial piety culture contained in it is an excellent culture that China has always inherited. And this relationship mainly manifests as intergenerational support and anticipated instrumental support for older adults (16). Intergenerational support is considered a factor related to depressive symptoms in older adults, and many studies have been conducted in-depth studies from different content and directions of intergenerational support (17–20). These studies focus on the impact of actual support received or provided by older adults on their depression. Anticipated support, the subjective perception of older adults toward future events, may buffer external stress on mental health (21). Studies has found that anticipated support can bring a sense of security to older adults and is negatively associated with depression (22–24). Among the various aspects of anticipated support, older adults anticipated receiving instrumental support from their adult children (25). It can be observed that both intergenerational support and anticipated support may be important influencing factors for depression in older adults. However, there is limited research that simultaneously explores the impact of these two factors on depression in older adults. Therefore, this study aims to investigate the simultaneous impact of intergenerational support and anticipated instrumental support on depressive symptoms in older adults.

Research on the correlation between anticipated instrumental support and depression in older adults has predominantly focused on two areas. The first considers how anticipated support modulates depressive symptoms. For instance, studies leveraging data from the 2011 and 2013 waves of the China Health and Retirement Longitudinal Study (CHARLS) indicate that anticipated instrumental support is linked to a decreased depression risk among older adults (26). In contrast, other research has found that anticipated instrumental support could inadvertently harm certain older adults. For some older adults individuals, receiving such support means a decrease in their physical function and self-care ability, which can induce feelings of inferiority and burden (27). Krause compared the implications of both received intergenerational support and anticipated support on depression, highlighting their distinct and diverse effects on the mental health of older individuals (21). Dong et al. found that the association between anticipated instrumental support and depressive symptoms is influenced by the balance between expected and received instrumental support. Older adults who received greater instrumental support than they expected were more likely to have a lower risk of depressive symptoms, while those with greater instrumental support expectations than actual receipt were more likely to have a higher risk of depressive symptoms (28).

The second focal area concerns the influence of various sources of anticipated support on depressive symptoms in older individuals. Cheng (29) comparative study between Chinese and American older adults, using data from the 2010 and 2012 waves of the Health and Retirement Survey in the United States and the 2011 and 2013 waves of CHARLS in China, discovered that, in China, anticipated instrumental support from children was a more vital protective factor against depression than support from other sources (29). This contrast was not evident in the U.S. data. These disparities are likely rooted in cultural beliefs and systemic paradigms. Within the Chinese cultural framework, there is a deeply ingrained ethos of children serving as primary caregivers during their parents' later years, exemplifying the revered tenet of filial piety. Such caregiving, apart from satisfying emotional yearnings (30, 31), addresses tangible needs, especially against the backdrop of China's limited institutional older adults care and social welfare infrastructure (32, 33). Given this context, the distinct sources of anticipated instrumental support in China must be dissected. Understanding their varied impact on depression can unveil the interplay between traditional family expectations, present-day social systems, and the well-being of older adults.

In summary, there are several limitations to current studies. Firstly, most studies tend to analyze the relationship between intergenerational support or anticipated instrumental support and depressive symptoms in older adults separately, with few studies integrating intergenerational support and anticipated instrumental support to discern their collective implications for depression. Given that both domains distinctly influence mental well-being in older adults, an exclusive focus on either facet could inadvertently introduce analytical biases (26, 34). Secondly, the research that concentrates on older populations in China largely draws upon survey data from a decade past. This temporal distance is pertinent, considering the substantial shifts that have transpired in China's social welfare landscape, elder care paradigms, and familial configurations (35, 36). Thus, the following question arises: How does the evolving socio-cultural milieu impact the interplay between anticipated instrumental support, particularly from varied sources, and depression in older adults? Thirdly, while children play a significant caregiving role, spouses are equally pivotal in older adults' lives (37). Hence, exploring the influence of anticipated instrumental support from spouses on depression warrants deeper exploration. In addressing these gaps, this study harnesses the 2018 CHARLS dataset, encompassing both intergenerational support and anticipated instrumental support metrics, to analyze their effects on depression in older adults. The fact that the nature of support (anticipated, provided, or received) and its source (spouses, children, or others) could have intertwined effects on depression must be recognized. By concurrently assessing diverse types of

received support and the different sources of anticipated instrumental support, we aim to unveil the intricate interplay of these variables. In doing so, we hope to offer a comprehensive view of their collective influence on the mental health of older adults, thereby laying the groundwork for future interventions targeting depression.

Methods

Data sources

This study utilized data from the 2018 wave of CHARLS, an expansive interdisciplinary survey project overseen by the National School of Development at Peking University. In 2018, CHARLS distributed questionnaires to 450 communities across 150 counties in 28 provinces, including autonomous regions and municipalities directly governed by the central government. The sampling procedure was rooted in a stratified random method. The survey encompassed 19,816 individuals aged 45 and above, of whom 10,997 were 60 or older. A total of 7,117 samples with adult children aged 60 years and older with complete records (no missing data) were included in this study, excluding those with "do not know" and "refused to answer" response options.

Variable selection

Dependent variable

The outcome of interest was the presence or absence of depressive symptoms in respondents. This was gauged using the short-form Center for Epidemiologic Studies Depression Scale (CES-D-10) featured in the CHARLS questionnaire, with comparable predictive accuracy compared with the full-length 20-item CES-D (38, 39). The CES-D-10 includes 10 items, each with four graded response options. These options are scored from 0 to 3, progressing from positive to negative sentiments. The total score is derived by summing the scores from all 10 items. Following an established cutoff of 10 indicating depressive symptoms, respondents scoring 10 or above were classified as having depressive symptoms (coded as 1), while scores below 10 indicated an absence of depressive symptoms (coded as 0) (38).

Independent variables

Table 1 delineates the specific categories and distinctions within intergenerational support and anticipated instrumental support. Given the patterns of support provision and receipt observed among respondents, this study parsed intergenerational financial and instrumental support into four categories: non-exchange—respondents neither provided nor received any support over the past year; providing only—respondents solely provided support without receiving any in return during the preceding year; receiving only—respondents solely received support and did not offer any within the same timeframe; mutual support—respondents both provided and received support during the past year. Considering the intrinsic reciprocal quality of emotional support, it was categorized simply as either non-exchange or mutual emotional support. The expectation around future instrumental support was bifurcated into two broad categories: those who did and those who did not anticipate receiving instrumental support. Within this context, the expected sources of instrumental support were grouped into four segments: spouse and children—respondents anticipate receiving support from both these sources; spouse only—support is expected solely from the spouse; children only—support is anticipated exclusively from children; others—respondents expect support from sources other than spouses or children.

Control variables

Existing literature has emphasized that depression in older adults is modulated by many individual factors (40–42). To account for these multifaceted influences, this study incorporated several control variables, including gender, age, marital status, place of residence, education level, health insurance, and self-rated health. Marital status was segmented into two primary categories: (1) married—this encompassed individuals who were married and cohabitating with their spouse and those married but residing separately because of work-related reasons; (2) unmarried—this broader category included individuals who were separated (not cohabitating with their spouse), divorced, widowed, or had never married. The specific classifications and corresponding details for each variable can be found in Table 2.

Results

Demographic overview of the respondents

Of the 7,117 respondents considered in this study, 3,513 (49.36%) and 3,604 (50.64%) identified as male and female, respectively. A significant majority, 5,782 (81.24%), were in marital unions, and 1,335 (18.76%) were not. Regarding place of residence, 5,219 (73.33%) resided in rural settings, with the remaining 1,898 (26.67%) living in urban areas. Given China's varied gender and regional dynamics, which include distinct urban and rural contexts, our sample's balanced representation from these groups suggests that it effectively mirrors the wider older Chinese population. Notably, 38.89% of the older respondents exhibited depressive symptoms, and an encouraging 71.13% anticipated the availability of instrumental support. Detailed respondent demographics are available in Table 3.

Determinants of depression in older adults

Table 4 presents the correlation analysis between individual factors and the manifestation of depressive symptoms among respondents. The findings revealed that, except for age, all control variables were significantly associated with depressive symptoms. Further, every independent variable—encompassing intergenerational financial, instrumental, and emotional support, and anticipated instrumental support—displayed a significant correlation with depressive symptoms in this age group.

10.3389/fpubh.2024.1278901

TABLE 1 Questionnaire of intergenerational support and anticipated instrumental support.

Scale	Items	Response options	Categorization
Intergenerational financial support	(1) During last year, what was the amount of Financial support provided to [Child Name]?	>0	Provide
		=0	No provide
	(2) During last year, what was the amount of Financial support received from [Child Name]?	>0	Receive
		=0	No receive
Intergenerational instrumental support	(1) During last year, did you/your spouse spend time in taking care of your grandchildren?	Yes	Provide
		No	No provide
	(2) Who most often helps you with (dressing, bathing, eating, getting out of bed, using the toilet, controlling urination and defecation, doing chores, preparing hot meals, shopping, managing money, making phone calls, taking medications)?	Children	Receive
		Other options	No receive
	(3) Do you live with your children?	Yes	Receive
		No	No receive
Intergenerational emotional support	(1) When [ChildName] is not living with you, How often do you see each other?	≥1 time per week	Receive
		<1 time per week	No receive
	(2) When [ChildName] is not living with you, How often do you contact with [Child Name] on phone/by message/on WeChat/by mail/by email?	≥1 time per week	Receive
		<1 time per week	No receive
Anticipated instrumental support	(1) Suppose that in the future, you needed help with basic daily activities like eating or dressing. Do you have relatives or friends (besides your spouse/partner) who would be willing and able to help you over a long period of time?	Yes	Available
		No	Not available
	(2) What is the relationship to you of that person or those persons?	Spouse and children	Spouse and children
		Spouse	Spouse only
		Children	Children only
		Other options	Others

TABLE 2 Variables and assignments.

	Variable	Assignment
Dependent variable	Depressive symptoms	0 = no depressive symptoms; 1 = with depressive symptoms
Independent variables	Intergenerational financial support	0 = no exchange; 1 = only provide; 2 = only receive ; 3 = mutual support
	Intergenerational instrumental support	0 = no exchange; 1 = only provide; 2 = only receive ; 3 = mutual support
	Intergenerational emotional support	0 = no exchange; 1 = mutual support
	Anticipated instrumental support	0 = not available; 1 = spouse and children; 2 = spouse only; 3 = children only; 4 = others
Control variables	Gender	0 = male; 1 = female
	Age	0 = 60–64 years; 1 = 65–69 years; 2 = 70–74 years; 3 = over 75 years
	Marital status	0 = unmarried; 1 = married
	Residence	0 = urban; 1 = rural
	Education	0 = illiteracy; 1 = primary school; 2 = junior high school; 3 = senior high school and above
	Type of medical insurance	0 = no insurance; 1 = medical insurance for urban workers; 2 = medical insurance for urban residents; 3 = new rural cooperative medical insurance
	Self-rated health status	0 = excellent; 1 = good; 2 = fair; 3 = poor; 4 = very poor

TABLE 3 Basic characteristics of survey samples (n = 7,117, n/%).

Category	n	%	Category	n	%
Gender			Self-rated health status		
Male	3,513	49.36	Very good	777	10.92
Female	3,604	50.64	Good	802	11.27
Age			Fair	3,473	48.80
60–64 years	2051	28.82	Poor	1,597	22.44
65–69 years	2,237	31.43	Very poor	468	6.58
70–74 years	1,435	20.16	Intergenerational financial support		
Over 75 years	1,394	19.59	No exchange	1,172	16.47
Marital status			Only provide	395	5.55
Unmarried	1,335	18.76	Only receive	3,778	53.08
Married	5,782	81.24	Mutual support	1772	24.90
Residence			Intergenerational instrumental support		
Urban	1898	26.67	No exchange	2,356	33.10
Rural	5,219	73.33	Only provide	1,530	21.50
Type of medical insurance			Only receive	1813	25.47
No insurance	359	5.04	Mutual support	1,418	19.92
Medical insurance for urban workers	1,036	14.56	Intergenerational emotional support		
			No exchange	1,298	18.24
Medical insurance for urban residents	1,205	16.93	Mutual support	5,819	81.76
			Anticipated instrumental support		
New rural cooperative medical insurance	4,517	63.47	Not available	2055	28.87
			Spouse and children	1,534	21.55
Education			Spouse only	784	11.02
Illiteracy	1865	26.20	Children only	2,650	37.23
Primary school	3,282	46.11	Others	94	1.32
Junior high school	1,215	17.07	Depressive symptoms		
Senior high school and above	755	10.61	Yes	4,349	61.11
			No	2,768	38.89

Evaluating the influence of intergenerational support and anticipated instrumental support on depression among older adults

This study employed three binary logistic regression models, using the occurrence of depressive symptoms among respondents as the dependent variable. In model 1, control variables that exhibited significant correlations with the manifestation of depressive symptoms in the univariate analysis were included to assess their influence on depression. Building upon model 1, model 2 integrated the three domains of intergenerational financial, instrumental, and emotional support to examine their collective impact on depression in this demographic. Model 3, an extension of model 2, introduced the variable of anticipated instrumental support to examine its influence according to different anticipated sources. The Hosmer test results for all models exceeded 0.05, indicating a satisfactory model fit (43). For a detailed breakdown, refer to Table 5 and Figure 1.

Model 1 evaluated the influence of control variables on depressive symptoms among the older population. The findings were as follows: (1) Women had 1.71 times the odds of experiencing depressive symptoms compared with men. (2) Married individuals had 22% lower odds of manifesting depressive symptoms than their unmarried counterparts. (3) Compared with those without formal education, individuals with junior high school education and high school or higher education had 19 and 32% reduced odds of showing depressive symptoms, respectively. (4) Older adults covered by urban employee health insurance had 35% reduced odds of experiencing depressive symptoms relative to those without any health insurance. (5) Contrary to individuals who rated their health as "very good," the odds of having depressive symptoms for those whose self-rated health was "good," "fair," "poor," and "very poor" were 1.47, 2.55, 6.76, and 14.06 times higher, respectively. (6) No significant differences in the

TABLE 4 Correlation analysis of the influencing factors of depressive symptoms (n = 7,117, n/%).

Category	Non-depressive	Depressive	Chi-sq	p-value
Gender				
Male	2,414(55.51)	1,099(39.70)	169.00	0.00
Female	1935(44.49)	1,669(60.30)		
Age				
60–64 years	1,261(28.99)	790(28.54)	2.76	0.43
65–69 years	1,383(31.80)	854(30.85)		
70–74 years	850(19.54)	585(21.13)		
Over 75 years	855(19.66)	539(19.47)		
Marital status				
Married	3,644(83.79)	2,138(77.24)	47.62	0.00
Unmarried	705(16.21)	630(22.76)		
Residence				
Urban	1,311(30.14)	587(21.21)	69.10	0.00
Rural	3,038(69.86)	2,181(78.79)		
Education				
Illiteracy	983(22.60)	882(31.86)	176.54	0.00
Primary school	1938(44.56)	1,344(48.55)		
Junior high school	851(19.57)	364(13.15)		
Senior high school and above	577(13.27)	178(6.43)		
Self-rated health status				
Very good	647(14.88)	130(4.70)	813.80	0.00
Good	625(14.37)	177(6.39)		
Fair	2,303(52.95)	1,170(42.27)		
Poor	652(14.99)	945(34.14)		
Very poor	122(2.81)	346(12.50)		
Type of medical insurance				
No insurance	224(5.15)	135(4.88)	133.60	0.00
Medical insurance for urban workers	788(18.11)	248(8.96)		
Medical insurance for urban residents	765(17.59)	440(15.90)		
New rural cooperative medical insurance	2,572(59.14)	1945(70.29)		
Intergenerational financial support				
No exchange	647(14.88)	525(18.97)	63.65	0.00
Only provide	231(5.31)	164(15.92)		
Only receive	2,255(51.85)	1,523(55.02)		
Mutual support	1,216(27.96)	556(20.09)		
Intergenerational instrumental support				
No exchange	1,388(31.92)	968(34.97)	11.14	0.01
Only provide	983(22.60)	547(19.76)		
Only receive	1,109(25.50)	704(25.43)		
Mutual support	869(19.98)	549(19.83)		
Intergenerational emotional support				
No exchange	697(16.03)	601(21.71)	36.67	0.00
Mutual support	3,652(83.97)	2,167(78.29)		

(Continued)

TABLE 4 (Continued)

Category	Non-depressive	Depressive	Chi-sq	*p*-value
Anticipated instrumental support				
Not available	1,030(23.68)	1,025(37.03)	180.10	0.00
Spouse and children	1,089(25.04)	445(16.08)		
Spouse only	466(10.72)	318(11.49)		
Children only	1702(39.14)	948(34.25)		
Others	62(1.43)	32(1.16)		

TABLE 5 Regression analysis of the effects of anticipated instrumental support on depressive symptoms in older adults (n = 7,117).

Category	Model 1	Model 2	Model 3
Gender (male = 0)			
Female	1.71(1.53–1.92)***	1.75(1.57–1.96)***	1.78(1.59–2.00)***
Marital status (unmarried = 0)			
Married	0.78(0.68–0.89)***	0.79(0.69–0.90)***	0.80(0.69–0.92)**
Residence (urban = 0)			
Rural	1.13(0.98–1.30)	1.12(0.97–1.29)	1.14(0.98–1.32)
Education (illiteracy = 0)			
Primary school	1.01(0.89–1.15)	1.01(0.89–1.16)	1.03(0.90–1.18)
Junior high school	0.81(0.68–0.96)*	0.82(0.68–0.98)*	0.82(0.68–0.98)*
Senior high school and above	0.68(0.54–0.85)**	0.69(0.55–0.86)**	0.68(0.54–0.85)**
Type of medical insurance (no insurance = 0)			
Medical insurance for urban workers	0.65(0.49–0.86)**	0.64(0.48–0.85)**	0.66(0.49–0.88)**
Medical insurance for urban residents	0.87(0.67–1.13)	0.87(0.67–1.14)	0.93(0.71–1.21)
New rural cooperative medical insurance	1.07(0.84–1.37)	1.08(0.84–1.38)	1.15(0.89–1.47)
Self-rated health status (very good = 0)			
Good	1.47(1.14–1.90)**	1.46(1.13–1.89)**	1.49(1.05–1.76)**
Fair	2.55(2.08–3.12)***	2.55(2.08–3.13)***	2.53(2.06–3.11)***
Poor	6.76(5.44–8.39)***	6.74(5.43–8.38)***	6.58(5.28–8.19)***
Very poor	14.06(10.58–18.69)***	14.17(10.65–18.86)***	13.57(13.57–18.12)***
Intergenerational financial support (no exchange = 0)			
Only provide		1.36(1.05–1.75)*	1.36(1.05–1.76)*
Only receive		0.81(0.70–0.94)**	0.85(0.73–0.99)*
Mutual support		0.77(0.65–0.91)**	0.79(0.67–0.94)**
Intergenerational instrumental support (no exchange = 0)			
Only provide		0.88(0.76–1.02)	0.90(0.78–1.05)
Only receive		0.86(0.75–0.99)*	0.89(0.78–1.02)
Mutual support		0.93(0.80–1.07)	0.98(0.84–1.14)
Intergenerational emotional support (no exchange = 0)			
Mutual support		0.76(0.67–0.87)***	0.81(0.71–0.93)**
Anticipated instrumental support (not available)			
Spouse and children			0.48(0.41–0.56)***
Spouse only			0.75(0.62–0.90)**
Children only			0.54(0.47–0.61)***
Others			0.60(0.37–0.97)*

*<0.05; **<0.01; ***<0.001.

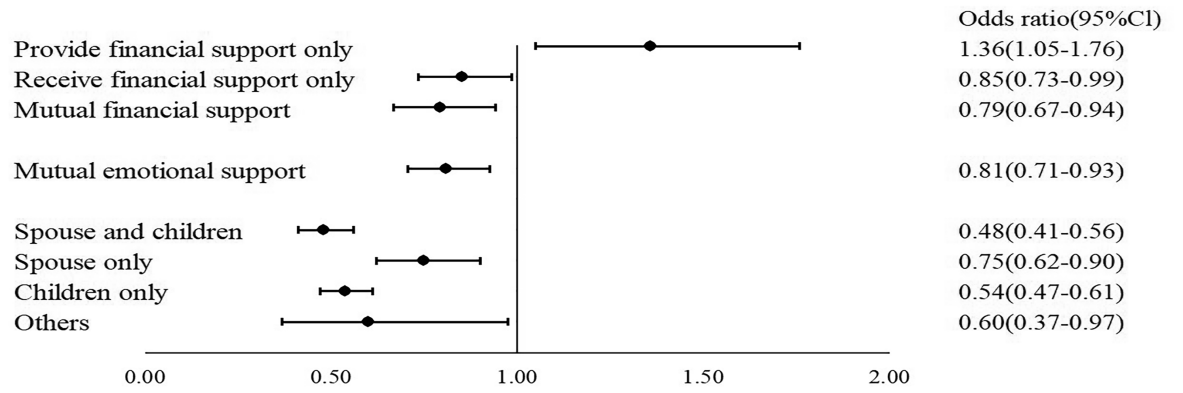


FIGURE 1
Forest diagram of factors influencing depressive symptoms in older adults.

odds of depressive symptoms were observed between urban and rural dwellers, those with primary education and those without formal education, or those without insurance and those with different health insurance types, such as urban residents' health insurance and new rural cooperative insurance.

Model 2 assessed the influence of intergenerational support on depressive symptoms among the older population. The findings were as follows: (1) Regarding intergenerational financial support, older adults who solely provided financial support had 1.36 times the odds of experiencing depressive symptoms compared with those not engaged in any financial exchange; Those who only received and those engaged in mutual financial support had 19 and 23% reduced odds of depressive symptoms, respectively, compared with those without any financial exchange. (2) For intergenerational instrumental support, older adults who solely received instrumental support had 23% reduced odds of experiencing depressive symptoms compared with those not involved in any instrumental exchange. No significant difference in the odds of depressive symptoms was observed between individuals only providing instrumental support, those with mutual instrumental support, and those without any instrumental exchange. (3) For intergenerational emotional support, older adults with mutual emotional support had 24% reduced odds of manifesting depressive symptoms compared with those without any emotional exchange.

Finally, Model 3 explored the influence of various sources of anticipated instrumental support on depressive symptoms in the older population. The analysis revealed that anticipating support from different sources acted as protective factors against depression. Specifically, older adults who anticipated spousal and child support, spousal support only, child support only, or support from other sources had 52, 25, 46, and 40% reduced odds of experiencing depressive symptoms, respectively, compared with those without such expectations.

Discussion

The role of anticipated instrumental support in protecting older adults from depression

After adjusting for the effects of intergenerational support and individual-related factors, older adults without an anticipation of receiving instrumental support displayed notably higher odds of developing depressive symptoms. The odds of depressive symptoms were reduced by 52, 25, 46, and 40% for those anticipated instrumental support from spouse and children, spouse only, children only, and other sources, respectively, compared with their counterparts without such anticipation. These findings align with those of Cheng (29), who used data from the 2011 and 2013 waves of CHARLS (29).

The current study delved deeper into the effects of different sources of anticipated instrumental support—spouse and children, spouse only, children only, and other sources—on depressive symptoms in older adults. The results showed that all support sources significantly reduced the odds of depression, with varying magnitudes. We found that anticipated support from spouses and children exhibited the most significant protective effect against depression. These outcomes emphasize the evolving role of anticipated instrumental support in safeguarding older adults against depression as societal dynamics shift. Such effects can be traced back to traditional Chinese cultural values and the prevalent social welfare system. In China, caregiving within the household remains paramount, with spouses and children being the primary caregivers for older adults (44). The anticipation of receiving instrumental support, particularly from family members, lessens anxieties among older adults.

However, recent demographic shifts have seen the family living structure in China transition from predominantly multi-generational households to more nuclear configurations. The number of older adults living solely with their spouses or alone has increased (45). Further, the anticipation of receiving instrumental support from children has been declining (29). This evolution underscores the burgeoning importance of anticipated support and its heightened influence on the mental well-being of older adults. Reliable and trusted caregiving anticipation, especially from close family members, can alleviate mental stressors. The absence of this anticipation can amplify anxieties and the potential for depression. Notably, the anticipation of support from other individuals appeared to reduce depressive symptoms more effectively than from a spouse alone (40% vs. 25%). This might be attributed to the fact that spouses are typically of a similar age, which introduces uncertainty regarding their caregiving capabilities and potentially intensifies stress. Compared

with spousal support, the anticipation of assistance from other sources, possibly younger or more capable individuals, offers a more certain relief, reducing the caregiving burden on families and mitigating feelings of guilt in the older generation (27).

Impact of various patterns of intergenerational support on depressive symptoms in older adults

Financial support

Older adults who solely provided financial assistance to their younger generations were found to be more susceptible to depression. Given that a considerable number of respondents (73.33%) resided in rural areas with relatively lower income levels, financially supporting their children could compromise their quality of life, which can, in turn, impact their overall well-being. This observation aligns with the findings of Zhang et al. (46). On the contrary, older adults who were solely on the receiving end or engaged in mutual financial transactions with their children had a reduced risk for depression. Such financial contributions from children can bolster a sense of accomplishment in older adults and alleviate financial stressors, further mitigating depressive tendencies. Importantly, mutual financial support demonstrated a more substantial protective effect against depression than merely receiving support, reducing depressive tendencies by 19% vs. 23%. Older adults providing support to children often reflects a sound financial foundation, while receiving support can be interpreted as a gesture of gratitude by the children. Such mutual financial support indicates solid intergenerational bonds and plays a pivotal role in warding off depression (47).

Instrumental support

Our findings indicated that older adults who exclusively received instrumental support showcased reduced depressive symptoms. Such support not only streamlines the daily undertakings of older adults but also provides more opportunities for them to bond with their children, which is instrumental in alleviating their anxiety.

Emotional support

Mutual emotional exchanges were identified as a protective factor against depression, a finding that resonates with Choi et al. (48). Strengthened emotional bonds are believed to intensify the connection between older adults and their offspring, minimizing the risk associated with depressive episodes (17).

Multiple factors influencing depressive symptoms in older adults

This study showed that various factors, such as gender, marital status, education level, health insurance, and self-rated health, significantly correlate with depressive symptoms among older adults. Within the sample of this study, 60.30% of older women exhibited depressive symptoms, a figure notably higher than that of their male counterparts. This suggests that older women face a greater susceptibility to depression compared with older men. Marital status emerged as another critical determinant. Relative to their married peers, those who remained unmarried often displayed signs indicative of diminished emotional comfort during their later years. Given the persistence of feelings such as loneliness, the onset of depressive symptoms becomes more probable (49). Further, a positive correlation was observed between superior self-rated health and reduced depressive symptoms. This self-assessment is not merely a reflection of their physical state but also encompasses their perception of their health, which can, in turn, mirror their depressive state (50, 51).

This study comprehensively explored the effects of anticipated instrumental support, diverse types of intergenerational backing, and individual determinants on depression in older adults, offering a more nuanced understanding of the causative factors. However, certain limitations must be acknowledged. First, the utilization of cross-sectional data only permitted an analysis of the contemporary effects of the variables on depression without considering dynamic shifts over time. Future research employing panel data could delve deeper into these evolving dynamics. Second, this study did not factor in potential overlaps and synergies between the diverse intergenerational support and anticipated instrumental support. Because anticipated instrumental support may be influenced by intergenerational exchange, including content, direction, and recency (25). Additionally, the impact of different levels of anticipated instrumental support and intergenerational support on depression in older adults was not considered in this study. Prior research has found that older adults with 'high receipt and low expectations' were associated with fewer depressive symptoms, while older adults with "high expectations and low receipt" were associated with greater depressive symptoms, which might introduce some bias to the findings (28). In the future, we can employ structural equation models to explore the effects of different levels and sources of anticipated instrumental and intergenerational support on depressive symptoms in older adults.

Despite the limitations, our paper found that different sources of anticipated instrumental support and intergenerational support have significant effects on depressive symptoms in older adults and have important theoretical and policy implications. Firstly, our study offers new insights into research on depressive symptoms in older adults by combining the analysis of different sources of anticipated instrumental support and intergenerational support. Previous studies have predominantly focused on the availability of anticipated instrumental support, overlooking the distinct impact of various sources on depressive symptoms in older adults. Secondly, our findings can serve as a valuable reference for state policymakers in formulating relevant policies. Different sources of anticipated instrumental support represent the assessments and expectations of older adults in hypothetical situations. These insights can help us better understand the social and familial needs of older adults, providing essential guidance for the development of future intervention measures. Against the backdrop of an increasingly aging population and a consistently low fertility rate, the healthcare and long-term care requirements of older adults have increased. Moreover, the absence of a robust social security system, coupled with the early stage of the

long-term care insurance system, intimately associated with older adults, has intensified their dependence on anticipated instrumental support from their offspring. To attenuate depressive symptoms, especially those resulting from an anticipated lack of instrumental support, policymakers must holistically address care provisions for older adults and reduce the caregiving burden on families. Furthermore, fostering a more pronounced caregiving responsibility ethos within families, particularly among spouses and offspring, can enhance the resilience of older adults against potential future challenges.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Ethics statement

All the respondents signed informed consent at the time of participation, and this study was approved by the Institutional Review Board of Peking University (IRB00001052–11014). The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

DF: Writing – original draft, Writing – review & editing. FW: Writing – review & editing. BG: Writing – review & editing. QB: Writing – review & editing. GL: Writing – review & editing, Funding acquisition. JZ: Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

1. World Health Organization (2017) *Mental health among older adults*. Available at: https://www.who.int/zh/news-room/fact-sheets/detail/mental-health-of-older-adults.

2. Disu TR, Anne NJ, Griffiths MD, Mamun MA. Risk factors of geriatric depression among elderly Bangladeshi people: a pilot interview study. *Asian J Psychiatr*. (2019) 44:163–9. doi: 10.1016/j.ajp.2019.07.050

3. Pilania M, Yadav V, Bairwa M, Behera P, Gupta SD, Khurana H, et al. Prevalence of depression among the elderly (60 years and above) population in India, 1997-2016: a systematic review and meta-analysis. *BMC Public Health*. (2019) 19:832. doi: 10.1186/s12889-019-7136-z

4. Tang T, Jiang J, Tang X. Prevalence of depressive symptoms among older adults in mainland China: a systematic review and meta-analysis. *J Affect Disord*. (2021) 293:379–90. doi: 10.1016/j.jad.2021.06.050

5. Hu H, Cao Q, Shi Z, Lin W, Jiang H, Hou Y. Social support and depressive symptom disparity between urban and rural older adults in China. *J Affect Disord*. (2018) 237:104–11. doi: 10.1016/j.jad.2018.04.076

6. Fried EI, Nesse RM. Depression sum-scores don't add up: why analyzing specific depression symptoms is essential. *BMC Med*. (2015) 13:72. doi: 10.1186/s12916-015-0325-4

7. Alexopoulos GS. Depression in the elderly. *Lancet*. (2005) 365:1961–70. doi: 10.1016/S0140-6736(05)66665-2

8. Conell J, Lewitzka U. Adapted psychotherapy for suicidal geriatric patients with depression. *BMC Psychiatry*. (2018) 18:203. doi: 10.1186/s12888-018-1775-y

9. Conwell Y, Van Orden K, Caine ED. Suicide in older adults. *Psychiatr Clin North Am*. (2011) 34:451–68. doi: 10.1016/j.psc.2011.02.002

10. Penninx BW. Depression and cardiovascular disease: epidemiological evidence on their linking mechanisms. *Neurosci Biobehav Rev*. (2017) 74:277–86. doi: 10.1016/j.neubiorev.2016.07.003

11. Feng Z, Glinskaya E, Chen H, Gong S, Qiu Y, Xu J, et al. Long-term care system for older adults in China: policy landscape, challenges, and future prospects. *Lancet*. (2020) 396:1362–72. doi: 10.1016/S0140-6736(20)32136-X

12. Liu T, Sun L. An apocalyptic vision of ageing in China: old age care for the largest elderly population in the world. *Z Gerontol Geriatr*. (2015) 48:354–64. doi: 10.1007/s00391-014-0816-5

13. Lobanov-Rostovsky S, He Q, Chen Y, Liu Y, Wu Y, Liu Y, et al. Growing old in China in socioeconomic and epidemiological context: systematic review of social care policy for older people. *BMC Public Health*. (2023) 23:1272. doi: 10.1186/s12889-023-15583-1

14. Hu B, Wang J. Unmet long-term care needs and depression: the double disadvantage of community-dwelling older people in rural China. *Health Soc Care Community*. (2019) 27:126–38. doi: 10.1111/hsc.12630

15. Araujo de Carvalho I, Epping-Jordan J, Pot AM, Kelley E, Toro N, Thiyagarajan JA, et al. Organizing integrated healthcare services to meet older people's needs. *Bull World Health Organ*. (2017) 95:756–63. doi: 10.2471/BLT.16.187617

16. Dong X, Zhang M, Simon MA. The expectation and perceived receipt of filial piety among Chinese older adults in the greater Chicago area. *J Aging Health*. (2014) 26:1225–47. doi: 10.1177/0898264314541697

17. Li C, Han Q, Hu J, Han Z, Yang H. Impact of intergenerational support and medical expenditures on depression: evidence from rural older adults in China. *Front Public Health*. (2022) 10:840864. doi: 10.3389/fpubh.2022.840864

18. Li Y, Guo M. Filial piety matters: a study of intergenerational supports and parental health. *SSM Popul Health*. (2022) 18:101096. doi: 10.1016/j.ssmph.2022.101096

19. Litwin H. Social networks and well-being: a comparison of older people in Mediterranean and non-Mediterranean countries. *J Gerontol B Psychol Sci Soc Sci*. (2010) 65:599–608. doi: 10.1093/geronb/gbp104

20. Xia W, van Wijngaarden JDH, Huijsman R, Buljac-Samardžić M. Effect of receiving financial support from adult children on depression among older persons and the mediating role of social participation. *Int J Environ Res Public Health*. (2022) 19:12974. doi: 10.3390/ijerph191912974

21. Krause N. Anticipated support, received support, and economic stress among older adults. *J Gerontol B Psychol Sci Soc Sci*. (1997) 52:P284–93. doi: 10.1093/geronb/52b.6.p284

22. Besser A, Priel B. Attachment, depression, and fear of death in older adults: the roles of neediness and perceived availability of social support. *Personal Individ Differ*. (2008) 44:1711–25. doi: 10.1016/j.paid.2008.01.016

23. Cornman JC, Goldman N, Glei D, Weinstein M, Chang MC. Social ties and perceived support. *J Aging Health*. (2003) 15:616–44. doi: 10.1177/0898264303256215

24. Helgeson VS. Two important distinctions in social support: kind of support and perceived versus received. *J Appl Soc Psychol*. (1993) 23:825–45. doi: 10.1111/j.1559-1816.1993.tb01008.x

25. Lin IF, Wu HS. Intergenerational exchange and expected support among the young-old. *J Marriage Fam*. (2014) 76:261–71. doi: 10.1111/jomf.12093

26. Silverstein M, Gong CH, Kendig H. Perceived availability of future care and depressive symptoms among older adults in China: evidence from CHARLS. *BMC Geriatr*. (2020) 20:31. doi: 10.1186/s12877-020-1435-1

27. Schroepfer TA, Noh H. Terminally ill elders' anticipation of support in dying and in death. *J Soc Work End Life Palliat Care*. (2010) 6:73–90. doi: 10.1080/15524256.2010.489223

28. Dong X, Li M, Hua Y. The association between filial discrepancy and depressive symptoms: findings from a community-dwelling Chinese aging population. *J Gerontol A Biol Sci Med Sci*. (2017) 72:S63–8. doi: 10.1093/gerona/glx040

29. Cheng C. Anticipated support from children and later-life health in the United States and China. *Soc Sci Med*. (2017) 179:201–9. doi: 10.1016/j.socscimed.2017.03.007

30. Zang Z. The care types choice in filial culture: a cross-sectional study of disabled elderly in China. *Front Public Health*. (2022) 10:954035. doi: 10.3389/fpubh.2022.954035

31. Zhang Y, Harper S. The impact of son or daughter care on Chinese older adults' mental health. *Soc Sci Med*. (2022) 306:115104. doi: 10.1016/j.socscimed.2022.115104

32. Liu T, Sun L. Pension reform in China. *J Aging Soc Policy*. (2016) 28:15–28. doi: 10.1080/08959420.2016.1111725

33. Zhang L, Zeng Y, Fang Y. The effect of health status and living arrangements on long term care models among older Chinese: a cross-sectional study. *PLoS One*. (2017) 12:e0182219. doi: 10.1371/journal.pone.0185688

34. Wang C, Liu Z, Chen T, Wang J, Zhang X, Han B. Intergenerational support and depressive symptoms in old age: the difference between urban and rural China. *Front Public Health*. (2022) 10:1007408. doi: 10.3389/fpubh.2022.1007408

35. Bao J, Zhou L, Liu G, Tang J, Lu X, Cheng C, et al. Current state of care for the elderly in China in the context of an aging population. *Biosci Trends*. (2022) 16:107–18. doi: 10.5582/bst.2022.01068

36. Feng X-T, Poston DL Jr, Wang XT. China's one-child policy and the changing family. *J Comp Fam Stud*. (2014) 45:17–29. doi: 10.3138/jcfs.45.1.17

37. Liu S, Li C, Shi Z, Wang X, Zhou Y, Liu S, et al. Caregiver burden and prevalence of depression, anxiety and sleep disturbances in Alzheimer's disease caregivers in China. *J Clin Nurs*. (2017) 26:1291–300. doi: 10.1111/jocn.13601

38. Andresen EM, Malmgren JA, Carter WB, Patrick DL. Screening for depression in well older adults: evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). *Am J Prev Med*. (1994) 10:77–84. doi: 10.1016/S0749-3797(18)30622-6

39. Boey KW. Cross-validation of a short form of the CES-D in Chinese elderly. *Int J Geriatr Psychiatry*. (1999) 14:608–17. doi: 10.1002/(SICI)1099-1166(199908)14:8<608::AID-GPS991>3.0.CO;2-Z

40. Gong F, Zhao D, Zhao Y, Lu S, Qian Z, Sun Y. The factors associated with geriatric depression in rural China: stratified by household structure. *Psychol Health Med*. (2018) 23:593–603. doi: 10.1080/13548506.2017.1400671

41. Zhang C, Xue Y, Zhao H, Zheng X, Zhu R, du Y, et al. Prevalence and related influencing factors of depressive symptoms among empty-nest elderly in Shanxi, China. *J Affect Disord*. (2019) 245:750–6. doi: 10.1016/j.jad.2018.11.045

42. Zhao D, Hu C, Chen J, Dong B, Ren Q, Yu D, et al. Risk factors of geriatric depression in rural China based on a generalized estimating equation. *Int Psychogeriatr*. (2018) 30:1489–97. doi: 10.1017/S1041610218000030

43. Kramer AA, Zimmerman JE. Assessing the calibration of mortality benchmarks in critical care: the Hosmer-Lemeshow test revisited. *Crit Care Med*. (2007) 35:2052–6. doi: 10.1097/01.CCM.0000275267.64078.B0

44. Li L, Yu L. The influence of pension mode on the mental health of older adults-evidence from older adults in China. *Int J Environ Res Public Health*. (2021) 19:119. doi: 10.3390/ijerph19010119

45. Su Z, Hu Z, Peng X. The impact of changes in China's family patterns on family pension functions. *Int J Health Plann Manag*. (2017) 32:351–62. doi: 10.1002/hpm.2436

46. Zhang D, Wang Y, Jiao Y. The impact of social pension schemes on the mental health of the Chinese elderly: a mediating effect perspective of two-way intergenerational support. *Int J Environ Res Public Health*. (2022) 19:8721. doi: 10.3390/ijerph19148721

47. Zheng R, Yu M, Huang L, Wang F, Gao B, Fu D, et al. Effect of intergenerational exchange patterns and intergenerational relationship quality on depressive symptoms in the elderly: an empirical study on CHARLS data. *Front Public Health*. (2022) 10:1009781. doi: 10.3389/fpubh.2022.1009781

48. Choi K, Jeon GS, Jang KS. Gender differences in the impact of intergenerational support on depressive symptoms among older adults in Korea. *Int J Environ Res Public Health*. (2020) 17:4380. doi: 10.3390/ijerph17124380

49. Lee SL, Pearce E, Ajnakina O, Johnson S, Lewis G, Mann F, et al. The association between loneliness and depressive symptoms among adults aged 50 years and older: a 12-year population-based cohort study. *Lancet Psychiatry*. (2021) 8:48–57. doi: 10.1016/S2215-0366(20)30383-7

50. Ambresin G, Chondros P, Dowrick C, Herrman H, Gunn JM. Self-rated health and long-term prognosis of depression. *Ann Fam Med*. (2014) 12:57–65. doi: 10.1370/afm.1562

51. Ostberg D, Nordin S. Three-year prediction of depression and anxiety with a single self-rated health item. *J Ment Health*. (2022) 31:402–9. doi: 10.1080/09638237.2021.2022610

frontiers | Frontiers in Psychiatry

TYPE Policy and Practice Reviews
PUBLISHED 28 March 2024
DOI 10.3389/fpsyt.2024.1322184

OPEN ACCESS

EDITED BY
Lars Kuchinke,
International Psychoanalytic University Berlin, Germany

REVIEWED BY
Monica Verhofstadt,
Ghent University, Belgium
Devashish Konar,
Mental Health Care Centre, India

*CORRESPONDENCE
Edmund Howe
edmund.howe@usuhs.edu

RECEIVED 16 October 2023
ACCEPTED 23 January 2024
PUBLISHED 28 March 2024

CITATION
Howe E (2024) Psychotherapeutic approaches: hopefully, globally effective. *Front. Psychiatry* 15:1322184. doi: 10.3389/fpsyt.2024.1322184

Psychotherapeutic approaches: hopefully, globally effective

Edmund Howe*

Department of Psychiatry, Uniformed Services University of the Health Sciences, Bethesda, MD, United States

Many patients have lasting disorders due, for example, to excessive and chronic childhood stress. For these patients, certain psychotherapeutic approaches may be maximally effective, and this may be universally the case. This piece is intended to give providers optimal tools for reaching and helping these patients who, otherwise, may remain among those worst off. These interventions should enhance patients' trust, the quintessential precondition for enabling these patients to change. Specific interventions discussed include anticipating ambiguity and clarifying this before ambiguity occurs, therapists indicating that they will support patients' and families' wants over their own views, feeling and disclosing their emotions, validating patients' anger, laughing, going beyond usual limits, explaining why, asking before doing, discussing religion and ethics, and informing whenever this could be beneficial.

KEYWORDS

treatment, trust, challenges, validating, values

1 Introduction

Psychotherapy can change people's lives. It can change the quality of their life, from dreading every tomorrow to enjoying every day. Some clinical practices bring about these changes more than others, though all may need to be adapted to patients' different cultural values and beliefs. One review of leading psychological interventions found, for example, that among many interventions, 10 were most likely to be effective (1). These included what these authors call "affirmation and validation", paradoxical interventions, behavioral activation, and cognitive restructuring (2, 3). Many of these interventions, as others not listed here, are used most often for specific disorders. Many patients have, however, less specific, longer-lasting disorders, as those deeply affected, for instance, by chronic childhood stress. For these patients, more general approaches may be or are more effective, and this may universally be the case. As the above authors state, "Although some psychotherapies may make better marriages with some mental health disorders, the repeated Dodo Bird conclusion in general as well as for most disorders indicates that bona fide psychotherapies produce similar outcomes, once the researchers' allegiance effect is identified and controlled … optimal outcomes come about when empathic therapists collaboratively create an optimal relationship with an active client on the basis of the client's personality, culture, and preferences. Clinicians strive then to offer a therapy that

fits or resonates with the patient's characteristics, proclivities, and worldviews—in addition to diagnosis" [(4), at 1890–1, (5)].

This issue of *Frontiers in Psychiatry is* dedicated to helping patients, especially those with emotional needs who are worst off, to acquire equal access to treatment. In this piece, I hope to enhance providers' ability to accomplish this with all patients. I will refer to all medical personnel who may help these patients as "providers" throughout this piece since they may not only be doctors but also nurses and other providers. I will discuss several interventions, ranging from those offered by experts to those supported by empirical studies. Some measures may already be known to most providers, but even these providers may still find suggestions that add to their practices. Most interventions suggested should increase patients' trust, and this effect in turn may enhance patients' capacity to respond to whatever approaches providers are using (6). I will do this in three main sections: challenges; interventions, both general and specific; and controversies. For each suggestion discussed, I will provide illustrative case examples. I will also, after each, present in a sentence or two the core suggestion that providers may take from the prior discussion. I am hopeful that the approaches suggested may help providers reach particularly those patients who are worst off. It is these patients who most likely may need them.

Providers seeing these patients regardless may conclude prematurely that they are not able to help these patients. Providers have seen these patients, and these patients still may, for example, just want a place to stay or are primarily seeking attention. These patients may be discharged to their homes with no plans for follow-up. These patients may, though, have hidden and more severe underlying problems and, thus, need more help than others.

A real-life example here is "Tina". She was diagnosed as having borderline personality disorder, a disorder often applied to patients more difficult to treat (7, 8). Tina had, from the time of her early teens, spent most of seven "long" years in psychiatric hospitals, "drugged up to her eyeballs", she says, in psychiatric meds. [(7), at 16)]. Then, however, she met a therapist who believed that what Tina most needed was understanding. This insight began "a huge turning point" in Tina's life. She then did well, and if she had not had this help, she later said, she would have, she believes, been "medicated all the time", and her providers would have continued to see her as "more than anything else" an untreatable, difficult, "attention seeker". [(7), at 17, (9)].

This piece is mostly intended to help providers treat patients like Tina.

2 Challenges

Five challenges, I believe, prevail: to help patients feel safe, gain their trust, not judge them, engage their feelings, and show feelings.

2.1 Helping patients feel safe

Providers must help their patients feel safe. This is an absolute priority because if patients feel fear, this alone may preclude their capacity to respond to therapy. Many patients feel fear when they start therapy. They may fear, for instance, that if they are honest about themselves, their providers will disrespect and judge them, and then they will feel shame. Thus, patients may withhold information initially and always avoid this, or they may, in some way, verbally fight. Providers must anticipate this. If patients do fight to protect themselves, providers must address their underlying needs at once, not merely or even primarily set boundaries.

The example I will use as a paradigm for this situation involves fear that patients may feel whenever they perceive something their provider does is ambiguous. Patients who feel fearful or anxious see ambiguity more readily than others (10–12). They are more likely also to, then, infer that the meaning is most negative toward themselves even when this is not at all the meaning their provider intended (13–15). An example is a patient who had to reside in the hospital to receive daily treatments there necessary for her to survive. Her family was large, and family members visited her in shifts throughout the days and early evenings. This worked ideally for all. They found meaning and joy in this arrangement. Then, however, a provider updated in medical ethics feared that she might not know that if she chose to, she could decline her life-sustaining treatments. Thus, the provider told her this. She, however, saw him as meaning to suggest to her that she should end her life in this way —that if she did this and died, her family members could then go on with their lives without feeling that they had to visit her. She declined all treatments the next day and died shortly thereafter.

What this provider said was ambiguous. He had meant to just be sure that she knew. She read into what he said and what he did not intend. A possible remedy that providers may want to consider is anticipating ambiguity in what they say and then alerting their patients to this ambiguity before they speak. They can tell them that this alternative meaning, though present, is not what they intend, but they do not know how to say what they want to say in any other way.

Anticipate ambiguity. Clarify this before speaking.

2.2 Trust: the pre-condition for patients to do better

Helping patients feel safe is a necessary task. Earning their trust is a close second (16–18). How providers may best do this may be paradoxical. Providers knowing the importance of trust sometimes directly urge their patients to trust them. Why else, they might say, would they become providers, if they did not want to do for their patients what is best for them? This urging may, however, be counter-productive. It may evoke guilt, not trust, because patients, like all people, may simply not be able to *will* themselves to feel trust. Trust must come about on its own.

What, then, can providers do instead? What they can do is somewhat analogous to their forewarning their patients of ambiguity. They can advise their patients to *not* trust them—to not trust them until and unless this trust comes about naturally. This newfound trust may occur, providers may suggest, when the patient feels for whatever reason that the provider has earned this trust.

Providers can go beyond this. Providers can imagine the needs that patients could have that may even be not known to the patients

and then pursue ways of meeting these needs. As an example, when providers first anticipate that there could be an ethical conflict between patients or their families, on the one hand, and medical staff, on the other hand, providers may take the initiative to tell these patients and their families that if this conflict surfaces, providers will support them in every way possible. Providers may, for instance, lead patients in bringing an appeal, or if there is no avenue for this, seek to create one. Most critically, providers can indicate that if these parties want providers to do this, providers will seek to support these parties maximally, regardless of what providers believe. Providers may wholly disagree with what these parties want but still pursue with them what they want, *absolutely*, because it is what these parties want that alone counts.

There are two possible downsides. First, providers saying this, especially early on, may evoke these parties' fear, and this conflict may not later arise. As an example, the ethical conflict the provider anticipates may involve futility. The patient may, for instance, be dying from heart or liver failure but also have kidney failure. Renal dialysis, started at even this late time, may prolong this patient's life for a few weeks. The patient and family may want this. They may cherish this longer time with each other. The medical staff, though, may see their starting dialysis at this time as not life-prolonging but death-prolonging and futile. Staff may be concerned also that their initiating dialysis at this time would deprive other patients of the time and care that should be given to them. Thus, the staff may refuse to initiate dialysis and, legally, be able to do this. The staff may also have their hospital's explicit permission to do this. Providers calling this later possible conflict to patients' and families' attention may cause them unnecessary worry. Second, providers taking on this role on behalf of these parties may pit them against their own staff. These providers will have to be working with them later.

What, if any, might be the best limits to providers taking the above initiative? A threshold question that providers might want to ask themselves is what these patients would want if they had at their bedside 1) a specialist in their medical illness, 2) a lawyer, and 3) an ethicist and were wealthy enough to pursue in court what, with these three people's input, they have determined they want. This might be, for example, their having kidney dialysis, as in the situation just discussed. Those with assets can now seek this remedy. If those without these assets could not, this would violate their having equal access to treatment and thus might especially warrant providers' making this offer and intervention.

Support patients' and families' needs maximally. Tell them you will.

2.3 Our need, asymptotically, to not judge

A fault we all have and cannot, I believe, ever fully transcend is our proclivity to judge others. This includes judging our patients (19, 20). This tendency, like people gaining trust, may be outside our control. If we do judge our patients, this may be evident to them. Consciously or unconsciously, they may pick up on even non-verbal responses we do not know we are showing or even having. An example is our unknowingly raising an eyebrow (21). If this occurs, this may wholly negate our doing effective therapy by leaving patients feeling unsafe and losing their trust.

Why might we judge even when we strive not to? This may be in part because we may respond immediately to what we experience with felt judgments. This immediacy may have, through our evolution, helped enable us to survive. We may though, just moments later, find our minds flooded with logical reasons that support whatever we have felt. Nevertheless, these reasons may be spurious and unbalanced, and we may not know this (22–24). Unknowingly, we may then cherry-pick our reasons and have become more certain that our judgment is sound, not biased (25, 26).

A first step in combatting this risk of judging our patients is to check out objective grounds to try to see better whether our initial feelings and logic should hold (27). There are two other steps we can also consider taking. The first is to seek to get to know patients toward whom we feel bias better. When we know people better, our feelings toward them often shift. We may value them more as if we might our child or a close friend and see them more clearly as they are but less judgmentally.

When, if ever, should we *not* do this, but let our initial judgments stand, as they are? A test case example here might be parents who oppose providers giving their child pain meds because they believe these meds are unnatural and thus this would violate God's will. When this occurred, I suggested that this child's providers relieve this child's pain at once, which they did. Nevertheless, one can see these parents' views in a way that is not judgmental. They may want their child to have eternal life. More generally, providers may not be able to have it "both ways": they may not be able to treat others optimally while at the same time continuing to judge them. Providers' judging, always, may "show through".

A second possible means of reducing our judging is to try to see things through our patients' eyes to the degree that we can. People making this effort may successfully overcome their previous view of their patients as "other". There may be no limits here. Some have, by this means, come to feel both alike and bonded, for example, with patients who are homeless. I have experienced this, as I will later describe in more detail.

Here, again, there are downsides. These may be so subtle that they often are not known to us. We may feel greater empathy toward these patients as a result of our knowing them better, but, feeling this greater empathy, we may inadvertently do harm by distancing ourselves from these patients. This may be an unconscious response geared to lessen our own pain. We may, worse, again not intentionally respond then with pity (28). Still, the gains achieved from our making these efforts, relative to these harms, may be immense.

We are particularly prone to judging others, finally, for not taking responsibilities that we believe they can and should take. An example here, one perhaps especially painful to imagine, is providers deciding what they will do when they foresee that the genetic testing they may do on children and their parents may reveal that a father is not biologically related to his, her or their child (29–31). Providers encountering this situation may tell themselves that if these findings break up these families, the mothers get what they deserve because their irresponsibility caused this. This is the kind of judgment that providers should eschew.

Discern even tinges of judgments. Seek to undo them.

2.4 Feelings: ask about these as well as patients' thoughts

Feelings and thoughts may oppose each other. Thoughts may correct feelings, as we have seen when discussing our judgments. Feelings may guide us to see realities that we, using logic alone, may have missed. Providers may, also, pursue with their patients their gaining new insights from their feelings. This may be particularly likely since cognitive therapies tend now to so much predominate. When patients are re-experiencing terrifying feelings they once felt based on reality, they can learn to remind themselves, for example, that in their present situation, these feelings no longer reflect the threatening situation they once were in.

Pursuing ways in which patients can change painful feelings more directly may still, though, also be an important intervention. They may, too, share more troubling memories after each initial feeling that they share.

An approach called accelerated resolution therapy (ART) is, for instance, an example. ART involves patients envisioning the beginning of a past traumatic event and then re-directing in their mind's eye what occurs from there so that, in their newly imagined vision, they re-see what occurred in a way that is positively resolved (32). One patient, for example, as a teen had been assaulted. She then imagined in her mind's eye this person disintegrating such that his tiny parts fell into the soil and fertilized beautiful flowers that she then gave to children. She reported, immediately after this, feeling better.

Providers, as a second example, may ask patients having a painful feeling to re-create it in a way that is only mildly painful, and then while patients hold on to this feeling, talk them back through their life to see what other experiences, if any, come into their mind. This technique is called an affect bridge. Here, an example is a patient who was in love with a man she wanted to marry but felt discomfort when they began to become physically involved. She did not know why. I asked her to re-create this feeling in her mind and then guided her verbally while she was holding on to this feeling, back through the years of her life. Suddenly she shrieked, not in fright but in astonishment. "My boyfriend's eyes are just like those of a boy who bullied me during grade school", she said. Seeing this similarity for the first time, her negative response to her boyfriend then decreased, and they got married. This response is known as an "Aha!" reaction. Further, if patients have this response and providers tell them that when this happens their painful feelings may decrease, their knowing this may make this more likely to occur.

Elicit patients' feelings as well as their thoughts.

2.5 Consider sharing your own feelings

I have marveled and been struck again and again by how different providers experience different feelings toward the same patient. Sadly, on occasion, providers may, for instance, share behind closed doors that they dislike a patient, but one provider may greatly care for this same patient. How might this occur?

Providers assessing this situation may well regard this outcome as resulting from patient-initiated "splitting". They may see this patient as pitting this one provider against all the others—consciously or unconsciously *manipulating* these providers, much as some believe children may seek to split up their parents' views regarding something they want.

A different possibility and alternative explanation not considered so frequently, perhaps, is that the one provider still caring for this patient may be simply more emotionally gifted and relate to this patient and generally to people better than others. This possibility has far-reaching clinical implications. It may make the difference between patients doing badly or well. Two examples will illustrate this: the first involves parents who have just given birth to a child who is stillborn or who will die soon or foreseeably within days (33–35). These parents may feel at this time emotionally devastated. They may want above all else to avoid even thinking about, much less seeing, their deceased or dying child. Nevertheless, some parents in this situation can do better and remarkably so if they then can, notwithstanding their initially being in this state, somehow move themselves to see, hold, and bathe their child. This experience may transform their unbearable grief and even bitterness into what in their words may become a "beautiful" memory. They may change from believing that they would never again seek to have a child to wanting to have another or many children.

Providers knowing of this transformative possibility may believe that they should at least inform these parents of this possibility. Nevertheless, they may fear that no matter how they do this, these parents may feel enraged, thinking, "How could our provider suggest this to us at this time?" This may be an instance in which only the most emotionally gifted and psycho-socially skilled providers could inform these parents of this successfully without triggering parents' hurt and even rage.

A second example involves parents who have a child in grade school or above who is dying but who do not want their child to know this (36–38). They may have, again, understandable reasons. They may, for instance, not want to frighten their child. Thus, they may withhold this information, and their child's providers also may not tell the child this to respect these parents' decisions. This child as a result, though, may die feeling terribly isolated and all alone.

Some providers who have personally encountered this situation say that most often or at least often, these children already know that they are dying and, even if they do not, they do much better if they can share with their parents what they are feeling as these children die. Nevertheless, again, only the most emotionally gifted and emotionally skilled providers may be able to persuade these parents to inform their children that they are dying without evoking only the parents' anger. Only these providers may be able to convey successfully to these parents that their children may suffer much less if their parents tell them that they are dying and that these children, *as these parents*, may find this sharing most meaningful.

Some providers relative to others, then, lack these skills. Nevertheless, they may still have to do the best they can with the skills that they have. How might they best do this? I would suggest here that what providers may best do is to identify the feelings *they* have as opposed to hiding these feelings and letting these parents see the grief and pain that providers also share, making clear that

they know that their pain is, as it were, infinitely less. Providers may view sharing what they feel is "professionally" prohibited. Providers may have been taught during their training that they must at all cost maintain emotional distance and not overly respond to their feelings, both to be able to function satisfactorily as providers and to not lose their objectivity due to their becoming too attached to their patients. These absolutes could preclude providers, for example, from ever crying in the presence of a patient (39).

Nevertheless, if and when providers feel, but do not show this, patients and parents may both feel more alone and, as a consequence, feel less able to bear what they find unbearable. Patients and family members have said that when they were dying or a loved one was dying and a provider also felt sad and showed this, the provider's crying helped make their loss more bearable.

This same consideration arises also for providers who ethically consult. Then, they may exceptionally focus on which moral principles they should prioritize to help bring about the optimal ethical result. This effort principally involves abstract analysis. This effort may, however, take them further from recognizing their own feelings and deciding then whether to share these with patients—and parents. Their struggle to identify which among competing moral values should prevail may also distract providers from seeing how their patients are feeling so that they can then respond to these patients' felt needs, which—I would suggest—*always* should take precedence. This is because any feelings that the patients have are likely to interfere with their being able to best hear and understand what their providers are saying to them so that they can then respond optimally.

It may be as some have said that there is a "hidden curriculum" at some medical schools that leaves medical students less fully attuned to their patients' feelings over time. If true, it may be also that when providers encounter ethical conflicts, there is a similar "hidden ethics curriculum" taking place as well. This curriculum might move providers as they go through their ethics consultation training to focus progressively more and more on ethical analysis and less on patients' mutually exclusive emotional needs. This may be exemplified by what occurred when the patient related above misinterpreted her provider's ambiguous information and chose as a result to die the next day. He may have focused almost exclusively on the ethical importance of his enhancing her autonomy. He may have simply missed the more subtle, non-verbal manifestations of her hurting if, while he was speaking, she imagined that he might be the right—that she should give up her life for the sake of her family members.

Feel. And do not be afraid to then show this.

3 Interventions likely to be optimal

3.1 Interventions

3.1.1 General

In most psychotherapeutic endeavors, compassion and trust must be conveyed for clinical interventions to be maximally successful. The first moments of the first session may be exceptionally important (40). An example illustrating how even the smallest interaction may be important at this initial meeting involves how providers may best escort new patients from the waiting room to the treatment room after first greeting them. Should the provider lead, follow, or walk side-by-side? Providers may see this question as excessively conscientious. It is, however, not only important in its own right. It also illustrates paradigmatically how providers may best pay attention to all aspects of their interventions, such as, also, to consider both "the angle" and how far from their patients they should sit. All the interventions I will subsequently discuss here have a small but similarly important effect especially when considered together.

3.1.1.1 Validating patients always takes precedence—even and especially when they verbally "fight"!

Patients may fear that their providers will judge them as we have discussed. This fear may exist in regard to every word their providers say. Providers can help alleviate the likelihood and intensity of this fear by initially validating at least some aspect of what patients say. This conveys at least that providers are attempting to understand, as we can consider and imagine was so precious to Tina. Validation can *always* be genuine. There cannot *not* be some sound or valid rationale that underlies all patients' thinking no matter how illogical or irrational their conclusions may first appear. Some providers are, however, much better at discerning these underlying rationales. Those providers lacking this skill—this application of their imagination—must recognize this and do what they can as we have considered already, analogously when discussing providers who have greater psycho-social expertise relative to others. Here, providers may best acknowledge, again and again, if necessary, how much they want to understand what is most important to their patients. They must do this until they feel they have a sense of why their patients want what they do.

The example I will use here involves patients who, in one way or another, non-verbally "fight" in a non-dangerous way. An initial response often urged is to immediately set a firm boundary—to be sure that the patient knows what the provider sees as an absolute limit to what and how the patient can respond. "I will not tolerate this", the provider might say.

This demonstrates, of course, unequivocally, that the provider has "the power". This may, as well, be emotionally infantilizing for the patient. This may then ever thereafter limit the closeness each may feel for the other.

An alternate approach is for providers to not respond in this way, but rather, initially, to imagine that these patients are likely responding to something important to them. They may, for example, have fear regarding their illness. This "fighting" may come about, then, from their unconsciously defending themselves psychologically from this fear. Possibly, this fear may be more painful than anger to experience. Providers, then maintaining emotional control within themselves, may empathically inquire: "I may have said something insensitive. If I did, I'm very sorry. And if I did say something insensitive, if you would be willing to, could you tell me, so I can meet your needs better?" (39, 41)

This way of responding hopefully expresses unequivocally that the provider does not want to fight back or silence the patient by

showing who has the power. These patients may well know that they responded in a hostile way and then may appreciate the provider's effort to better understand. This provider's extra effort may not only reset their exchange but also re-establish a positive relationship that then continues.

Providers' memory of patients' hostility may also linger within them. They then have more work to do to reduce, ideally completely, their initial, possibly retaliatory reaction. Approaches they can use to pursue this end roughly mirror those discussed above for their undoing patient-disfavoring moral judgments. As an example here, we may again consider the couple we discussed above who sought to withhold pain-relieving meds from their child because they thought that these meds were unnatural and that thus their giving these meds to their child would go against God's will. Providers could then validate these parents' view even as they acknowledge that they must go against it, always, also, of course explaining why they are going against what these parents want, which is in this case to spare their child's feeling pain (42).

I experienced what may be a surprising and extraordinary response to providers' validating others' views. I was an ethics consultant when a conflict arose between the family and the staff treating a middle-aged woman who was then in a coma. She had remained totally unresponsive to every intervention her providers thought could be even possibly beneficial. She had remained in an ICU in this unresponsive state for weeks. At the staff's request, I met her family, together, to discuss this. There were five family members who were the mother's adult children. All five of both family and staff sat opposite each other on a long table. I sat at its end. The sole question raised and the one that the staff wanted to discuss was whether it was time "to respect this mother's dignity" by discontinuing her treatments and allowing her to die. The family objected. "But we—you", they responded in unison, "*still* don't know what is wrong".

I then concurred with them. "The family is right," I echoed. "We *don't* know what is wrong." This uncertainty, I could imagine, as did the family, increased the possibility that their mother could recover, although the chances were slim. The staff looked at me with surprise. I was supporting it seemed the family's view, not theirs. I was, but I was more than this, seeking primarily to validate the legitimacy of their contention.

There was then silence. Then, suddenly, the leader of this family said, "Maybe the staff *is* right. Mom could get better, but she hasn't. Maybe we should accept this and let her die with dignity." All the family then in short order agreed with their leader, though they had held the opposite view just moments earlier. Their mother's treatment then was withdrawn. She ironically fully recovered and left the hospital, walking, 2 weeks later.

Why did the family's view change? I would suggest that this family's decision to go "the other way" stemmed, at least in part, from my having validated their point of view. Just one other person's support may in many cases have this same effect. This particularly may be the case with patients and families when the person who supports them is a staff member. With this support, people, psychologically, no longer have to put so much or all of their effort into defending their challenged point of view. Rather, they can, to a greater degree, then, let this seeming necessity go and look at the problem confronting them more objectively, possibly coming out as they do here, the other way.

See and acknowledge what is compellingly sound in all that patients and families say.

3.1.1.2 Highly value meaning even when there is none

Many know of Viktor Frankl (43–46). He, after losing family members and surviving in a concentration camp, came to believe that those who like him had survived this experience may have and have had in common a sense that they still had meaning in their lives. This possibility has been supported much more recently by the gains that therapists have found in empirical studies on positive psychology (47). Based on these findings, some experts have suggested that as opposed to therapists focusing mostly or entirely on reducing so-called negative symptoms such as anxiety and depression, they should focus more, instead, on increasing patients' capacity to experience positive feelings, such as, principally, to be able to feel meaning in their lives and to be able to enjoy humor (48, 49). We shall consider humor subsequently.

Providers have focused on meaning in the past, particularly with patients who are dying. A most profound question sometimes emerging in this context is how patients can continue to find meaning in their lives when medically they have no way of living longer. These patients may find additional or new meaning in leaving their loved ones as their grandchildren able to retain positive memories of them even as they are dying. Providers often urge them also to find meaning in what they have passed on to others.

I am struck here by what may be left out of the above conversations. This is because, at these times, when patients are dying, they may want more than anything else to be able to discuss not their coming death nor what this means but everyday matters, as if they were not dying. I recall one patient, for example, with whom we discussed, as he died, nothing other than art. We would pursue this each time we met as though his dying was not an issue. I recall another friend whose skin was yellow due to jaundice. He attended professional meetings regularly just as he always had until he died. With still another person, we discussed how couples otherwise getting on well sometimes often both drink on Saturday nights and then virtually every weekend get into fights. This person, a patient, expressed how particularly priceless to him these discussions of everyday happenings were since they so distracted him.

Some patients find no meaning in their lives. I think here of a patient whose sole meaning in life had been to care for his wife who had a fatal disease and was slowly dying. He then himself had a rapidly fatal disease that would end his life before his wife would die. He felt despair. His life goal no longer existed. What can providers do then? I could be with him, sometimes just sitting. He told me he preferred me there as opposed to my being away. He shared with me then that he had asked a friend to bring him a gun to end his life, but his friend would not. When there is or may be no meaning for a patient, just being with another person who knows this may provide meaning—the meaning of just being *with.* This possibly, for many, is in actually *every* context, what life has most to offer.

Providers considering meaning with dying patients may be more important than any other interaction, however, for an

additional, less obvious reason. When we so converse, we are more clearly than usual, *with* our patients, simply other persons who like them share the same destiny. Both will die, although, at the time, one is dying while one is not. Both have this in common then, although, at the time, each is in a different role. This too may at the deepest level help patients not feel so alone.

Join dying patients. Whether they feel meaning or they do not.

3.1.1.3 Humor—best when the one laughs at the provider!

Frankl says that humor is most important in therapy. It distracts, he says, as we have just considered discussions of everyday life, and more than this, puts pain into deeper perspectives. To initiate humor is, however, risky. Patients are hurting. Providers offering humor at this time, then, may seem to patients insensitive, like asking parents whose infant has died or is dying if they would then want to see, hold, and bathe their baby. There may, though, be means of threading this seemingly impossible-to-thread needle. Providers may *ask*. They may say, for instance, "I find myself wanting to say to you now something that involves humor, but I fear that humor may be the last thing you would want at this time What do you think? Shall I share with you what I thought of saying?"

Questions often arise that similarly may help or harm. A most common example here is how providers should speak of patients' pain. Should they risk "overstating this", as patients experience this pain, or risk, referring to this pain with words that may call it less than it is? The "price" from this first route, providers saying "pain" when this may be to a patient little more than discomfort, is, in the view of some, that this may reinforce and thus increase this pain. It may even, they say, have a placebo-like effect and create pain where there was only discomfort by suggesting this. Nevertheless, providers using "lesser words", like "discomfort", may risk connoting to patients that their provider is not taking the degree to which they report their pain seriously.

Possibly the best resolution between these two risk-laden options is to choose not on the basis of the greater risk or best net effect but to base this decision on a different determination altogether—namely, on what may most strengthen or harm the relationship. Here, overstating this pain, like sharing humor, may in spite of their risks increase the caring between the two.

What is the highest goal providers might strive for with humor? I would suggest that this is for patients and providers to become so comfortable with each other that the patient can poke fun at the provider. I recall such an instance. A patient had been most stricken with medical issues. Due to his many exceptional problems, he often needed urgent appointments, such as to reduce suddenly occurring pain. Nevertheless, due to a busy schedule, he was sometimes told he would have to wait for a substantial time. I had once intervened to try to get him an earlier appointment and succeeded. Some would oppose my doing this. They might hold that providers should not use their medical identity to seek special privileges for their patients, but rather, if the system needs to change, to try to change it. I do not.

In any case, this same need again arose, and again I made this offer, to intervene on this patient's behalf, so that he could then get an earlier appointment and earlier severe pain relief. He said in response, "No thanks, not now. I have one other call I can make that could result in my having an appointment sooner. Then," he joked, "I'll *sik* you on them!" adding that he hoped his joking *at me* in this way I understood as conveying the warmth he intended.

Laugh with patients. They and providers need this.

3.1.1.4 Providers going beyond their usual limits

Providers not uncommonly self-sacrifice at least to small degrees when this is necessary to benefit their patients (50–52). This goes with the nature of the medical profession. Such sacrifices may be what patients need. Nevertheless, providers' sacrifices may also go beyond this, and when providers do this, patients' trust may increase immensely. When, if ever, providers should do this is, however, subject to disagreement.

A paradigmatic example illustrating this is patients who have insomnia and need a sleep med to be able to sleep. Providers may see one night's sleep as not worth their significantly self-sacrificing. Nevertheless, patients may respond to this problem in highly different ways. They may find lying awake in bed all night, for example, excruciating. Thus, they may suddenly on a Friday night first notice that they are out of sleep meds and then call their provider if they can in a panic, asking for help. Local pharmacies may then be closed. Providers may though accompany these patients at this late hour to find a pharmacy, somewhere, open all night and then find a way to enable these patients to get this medication and to sleep. This may require this provider to even go in person to this pharmacy because this sleep med is a controlled substance and the pharmacy may not be able to give it out in any other way.

Some providers encourage patients to call them at any time if they have such an urgent need, though they also provide a backup resource in case their patients cannot reach them. This possible full-time access has saved patients' lives. Patients calling 911 or now 988 when patients are suicidal may not, for one reason or another, suffice. John Gunderson, a psychiatrist and expert on treating patients with borderline personality disorder, made himself available to his patients "24/7" and described how he would respond to patients when they called him because they felt suicidal at an annual psychiatry meeting. He would urge them to go to an emergency room immediately. He was not, he said with a grin, his "usually charming self" on the phone at these times (53, 54).

The gains to patients from providers sacrificing their own interests, as Gunderson did, to help patients may be, as I said, most impactful, possibly even, saving patients' lives also in other ways. One patient, for example, refused to take anti-cancer meds, though taking them, his providers told him, would likely extend his life for more than a decade.

One provider then copied several articles that documented this claim and after work spent several hours showing these and discussing each with this patient. He finally "gave in". He took these meds and responded as predicted. This provider wondered whether his effort was too excessive. I would wager that it was not these articles that changed this patient's mind but the caring

commitment this provider showed to him. That is, the change agent, I suspect, was this provider doing this for him to this extent.

What should providers say if patients ask for help but providers will not go for them this second mile? There may be many reasons, of course, for this. Chief among these may be, for example, the law. Patients may, for instance, want off-label medications, but providers may see this as perhaps beneficial for these patients, but leaving themselves too vulnerable to being sued or even being sued if these patients have complications. Should providers, then, acknowledge to these patients that they could prescribe them and that other prescribers might, but that personally they are emotionally more risk-averse and unwilling to prescribe what the patient wants and even may need for this reason?

When providers are more fearful than others and disclose this, patients' responses may be more understanding of this and positive than providers may expect. They may understand that their providers are like them and say something like, "*I'm* sorry. Of *course*, I wouldn't want you to have something bad happen!"

Consider going the second mile.

3.1.2 More specific interventions likely also to globally be optimal

There are, in addition to the above more general approaches, several more specific interventions especially likely to be optimal for most patients worldwide. This may be the case notwithstanding the psychiatric disorders these patients have. This is because these approaches each are responsive to patients' universal proclivities, such as their wanting to understand why their providers are doing what they do, as opposed to patients complying without knowing why. Patients widely, as a second example, prefer having choices. The outcomes may be much the same, but the effects of subtle differences such as those described here may over the long run be more successful.

3.1.2.1 Explain *why*: to teach, respect, and more "equalize"

Therapists should always consider explaining why they will do what they will do before they proceed and "just" do it. Having explained, they can then ask patients whether they want them to proceed, and patients who are better informed at this time may then give different answers. Explaining "why", in addition to better informing patients, grants them more respect and implicitly renders them then or connotes them more as "equals". To the degree that patients know more, they, of course, *are* more equal. This practice also may enhance the degree to which patients and providers work together. These additional explanations may finally give patients more hope.

I recall a patient who feared leaving his house. He had had staggering personal losses throughout recent years, and the effect of this continuing stress had seemed to affect his functioning greatly. He had, for example, extreme agoraphobia. I described to him how gradual desensitization worked, emphasizing that we could start with as minimal a new slightly anxious activity as he was willing to bear. He had a porch. "Could you go a step out, I asked and then stay there, even if only for a few seconds?" He could, he said. He shared then later that his understanding of *why* he must take the initiative to do this as opposed to his just waiting for his fear to wholly wane as he had, enabled him to accomplish this breakthrough. In time, he was able to fly to his child's college and attend his graduation. He also shared after this that my explaining to him in detail why this might help meant to him that we were sharing this task *together*, as opposed to the responsibility for its success or failure being his alone.

Explain, even when and what you, the provider, do not know.

3.1.2.2 *Ask*. Respecting patients and at this same time lessening the risk of their being oppositional

All requests can be converted to questions (9). "I think you should do this", can be converted, for example, to "Would you be open to doing this?" A provider's asking this question converts this request into a question. A provider also can ask such questions, "Would you like me to tell you *why* I believe this could be helpful?" Providers sharing this can convey additional hope. Both these questions, of course, explain the why of the intervention proposed, and the change in sentence structure to questions may result in the patient accepting the request as opposed to partially or fully resisting it.

Providers asking as opposed to telling—or even just suggesting—lessens the risk of eliciting within patients an automatic, unintended, oppositional reaction. Asking them places them in the driver's seat. Questioning allows them to decide what they want, regardless of what therapists believe is best. This also is more empowering.

This does not mean, however, that providers should keep any view that they believe might be helpful to themselves to avoid triggering an oppositional reaction. Rather, caring for patients should mean sharing with them any and all considerations that they believe patients may want to know and could find helpful. Providers asking them if they would want their provider to share this additional information may also give them this additional choice.

Patients may ask therapists, as a first paradigmatic example here, for instance, "What would you do in my situation?" Providers may feel clear about how *they* would answer this question but believe that they should not disclose this because they are not their patients and have not been living their lives. Thus, they may see their saying what *they* would do as irresponsible. Providers may feel this way also because they know that just a few decades ago providers tended to believe that they knew better than patients what was best for them and often acted alone on the basis of this presupposition (55). Then, they might not tell patients that they had cancer, for instance, because they believed that these patients might kill themselves. They came to see this and other paternalistic acts as empirically mistaken as well as unethical. Their remedy was to remain neutral, and this resolve has persisted. Some providers share with patients now for this reason, only and exclusively, factual information.

A preferable approach then may be for providers to take every opportunity they can to give patients, after asking, information that they believe, plausibly, could be helpful. Providers can imagine and then can offer to share these risks of their saying what they would do before speaking. If they say what they would do, the main risk is patients going with or going against what their provider would have done and then regretting this. "I should have done what my provider would have done or not have done this just because this

is what my provider said," and then they may blame themselves later. There is here, though, a much stronger rationale for providers to say what they would do notwithstanding these risks. Namely, providers not sharing this may leave patients feeling emotionally abandoned by their providers. Patients' feelings and the relationship again as always should be the providers' chief priority and concern.

Similar concerns may arise when patients or families ask providers whether patients should have cardiopulmonary resuscitation (CPR) or request a do-not-resuscitate (DNR) order. Providers often have very strong views that they should not further provide futile treatments. They may in this instance also not want to risk breaking patients' ribs during CPR attempts only to have these patients die shortly thereafter. Thus, their tendency may be to respond with a "top-down" answer, sharing strongly what they feel is best. Providers doing this risk implying that they believe they know what is best for patients more than patients do. They may in this instance. They have medical knowledge and experience that their patients lack. This still, though, may not be sufficient to equip them to know what here is best for a patient.

What could providers do instead that may not leave the patient feeling emotionally abandoned? They could ask, "Would you like for us to together discuss this?" They could continue, "This answer, what is best for *you*, may depend on concerns most precious to you but that through discussion we may want to newly discover". This discussion may, of course, take more time. Some patients in medicine inevitably take and need more of the providers' time than others. The above patients may be among them.

A final consideration here is whether providers asking patients whether they would want to discuss this together is too coercive (56). Could the patients say, "No thanks", without feeling uncomfortable? Providers could, to help allay this risk, share with these patients the bind they imagine patients are in when they ask them this question. "We could discuss this for the reasons I've said", providers might say, "but I fear that my just asking you this may make it hard for you to say, 'No'. Nevertheless, whether you would want to discuss this depends wholly on *you*. Some patients discussing whether they would want CPR or a DNR order find this analysis complicating matters and thus being more painful. Others find that this helps. Which, then, would you prefer?"

The risk of providers inadvertently evoking an oppositional reaction is commonplace and universally present. Some patients have but hide their angry response. This may be harmful to them. This stress, unexpressed, may, for example, have a physically negative effect. Others though, as we have addressed, may non-physically fight, such as by having a clear edge in their voice. This oppositional response, warranted or not, may disrupt the relationship then and thereafter.

Ask. Re-phrase "top-down" thoughts as questions.

3.1.2.3 Self-disclose, though risky

Self-disclosing is no doubt risky. Patients, first, may not want to know or hear anything about their provider. They may think, "This therapy is about *me*, not them. Don't they know this?" Worse, and second, what providers divulge may diminish patients' confidence in their providers' competence. This may though too work the other way and benefit patients in ways that providers do not anticipate (57–59). One provider's disclosing that he was divorced evoked in his patient, for instance, an "Aha" response. This patient said to himself then, and only then, "Maybe I'm all right as I am. If my provider is divorced and doing this well, maybe, though I'm divorced, I'm okay too". He stopped therapy shortly after this and his life went well.

This example illustrates how providers' sharing information about themselves may benefit patients. It may particularly reduce patients' shame and guilt by modeling for the patient that their provider is not perfect either (60, 61). I have at times shared my own imperfections for this reason. I told one patient whom I had just called, for instance, that though I had just called him, I had misplaced his phone number while talking with him on the phone. I then asked him to give me the number again. This may have lessened a top-down assumption he had regarding me and our relationship. He was handy with a hammer. He then sought to advise me. "Do you know how to best hammer in a nail?" he asked. "No," I said. "You tap it first," he said. "Then you can hammer it in better."

Self-disclose. Delicately. Decide where to go then from there.

3.1.2.4 Reframe: what is half-empty always is half-full

Patients have any number of ways in which they can most ingeniously put themselves down. Cognitive therapy, of course, seeks to teach them how to recognize when they are doing this to themselves and how then they can more objectively reframe what they tell themselves. Providers can model this by putting whatever patients say negatively regarding themselves in a better but still sound light. That is, all glasses, half-empty are also half-full. This models for them what they can do also on their own.

I think here as an example of a father who felt deep despair when his daughter told him that she was getting a divorce. "I should have warned her," he said. "Her husband was penniless when she met him. I should have warned her that this wouldn't work." I told him then that I *totally* disagreed with him. I may say this using exactly these words when I know the patient will take this as my intending to share a caring endeavor and as my wanting them to particularly attend to what I will next say. I said to him then, "I think that instead you should be proud, *very* proud of yourself. By not opposing your daughter's marriage or even questioning it on financial grounds, you gave her the, perhaps, most valuable lesson a parent can give to their child to value persons for who and how they are, not for their money." He was staggered. He agreed with my view upon hearing it. He reframed at this moment how he saw himself.

Help patients see good they do not see. It is there.

3.1.2.5 Discuss religion—perilous, again, though this may be or at least seem to be contraindicated

Providers are commonly advised that they should not discuss religion with their patients, but, rather, have them discuss these topics with clergypersons or pastoral counselors since they are more equipped and thus prepared to address patients' spiritual concerns. Nevertheless, for many patients, their providers not being willing to

discuss these issues with them is a deep emotional gap and a loss. Providers discussing their religious beliefs with them can be, however, uniquely uplifting. These discussions can even undo the suicide-generating guilt that patients may feel due to their religious beliefs.

As an example, married and partnered patients may believe that merely thinking of having sex with another person may result in their eternal damnation, much like, perhaps, the parents who feared that if they gave their child unnatural pain meds, this would go against God's will. The above patients are devoutly religious. They may believe that if they just find another person to be attractive, this may have a similar outcome.

Providers may generally ask in this context whether such patients may see any religious distinction between what feelings they spontaneously have and how they then act in response to these feelings. Providers may ask them then if they believe that their God would judge and condemn them for having feelings they cannot choose or control. Providers merely asking these questions may serve to lessen such patients' self-condemnation. By just asking these questions, providers may also evoke new thoughts. These questions may then be enough to alter or significantly lessen these patients' conviction that they, unequivocally, may be damned for having feelings that they cannot control.

Discussions of religion can help undo unbearable self-condemning thoughts. This can move patients to imagine that in some ways they have put together self-harming ideas that may be wrong (62–64). These discussions can also, like the father condemning himself because his daughter was getting a divorce, enable such patients, then, to see themselves in a new, more positive light, even when this is unprecedented. I think here of patients who have suffered harm to themselves in efforts to help others. I recall, for example, a patient who helped others during a lunch break, came back late, and as a result of this, lost her job.

There are much more profound examples. I think here of the philosopher Simone Weil. During World War II, she said that she wanted to go with others behind enemy lines as a way to help end the war, though if she and others did this, they would most likely all have been killed (65). Providers can in these cases inform these patients that in their quest to help others, they may be enacting the highest goals in many religions—their sacrificing themselves for others. If patients have Christian convictions, providers can even speak of what they do and have done as in their essence comparative to acts of Jesus or Saints. This may be, to these patients, uniquely healing.

Discuss religion. Even tell patients when they seem saintly.

3.1.2.6 Support patients' taking responsibility—even when this is only 1% up to them

All providers encourage their patients to take responsibility for what they do and have done—even if they can only do better in their present and future. Thus, patients who have committed even horrendous crimes may still take responsibility for what they do from this point on. They may, knowing this, still derive feelings of self-worth as they go forward with their lives. Providers should tell them this. These patients may object in a given instance, saying that their spouse or partner, for instance, has been and is at fault 99% of the time. They may be right. They still can take responsibility, however, for whatever was or is within their control.

I recall, for instance, a woman who fumed because, for the first time ever, her husband threw a foam cup at her. He might have a newly acquired impulse control problem, she mused, even early dementia. What was missing from her account was, however, what she might have done, no matter how small, to elicit this. She could not see any way in which she too may have contributed to his doing this. As it turned out, he had tried to help her, asking her if she wanted to "sit" and she had misheard this word. She scowled. "I'm *not* angry", she angrily said.

Providers' ultimate goal here and one that they should tell patients is that they should free themselves in these negative interactive instances from seeking to assess who is to blame and assigning relative percentages of blame for each party. Each person's task is rather to identify how they may have contributed and then to change this.

To whatever degree each contributed, they should not seek to make excuses but rather apologize, see if they can make amends, and look to how they can avoid repeating this in the future. Their self-worth continues to exist though. They, like all of us, will be vulnerable to harming others, both intentionally and unintentionally. Providers should also tell them this.

A second goal in these instances is for each person feeling harmed to not only not judge the other but also to seek to understand the other party's feelings, much as we discussed above when we considered how providers might optimally respond when patients fight with an edge in their voice. Patients then can strive to validate some aspect of the other party's feeling upset just as providers can, as we discussed above. The wife above could acknowledge, for example, how it would have been particularly hard for her husband to have experienced her angry reaction when he was just trying to help.

Stress patients facing up to what they do. No excuses.

3.1.2.7 Challenge patients' insistence on justice. What people feel is usually what is much more important

This need for patients to place others' feelings above what they see as justice may arise in many guises. Patients commonly adhere to moral principles they feel they must not compromise, notwithstanding the devastating effects to others and themselves from their doing this that hopefully they can foresee. Providers often must address this so that their patients can see this and then make better choices for both others and themselves.

The prototypic example of this harm is grandparents who cannot resist telling their adult children, now parents of their grandchildren, what, in these grandparents' view, their children, as parents, are doing wrong. These grandparents may be right. Discipline causes children, for example, some stress, but this may benefit these children later on by equipping them with greater resilience. Too harsh discipline may, though, be harmful.

Regardless of the extent to which grandparents are or are not right, however, their intervening too much or too often may have a

negative outcome for all parties. Their adult children may ever increasingly distance themselves from these grandparents such that they lose what is most precious to them—their being able to be with their children and grandchildren. "But, we are *right*!" these grandparents may protest. This may be the case, but the loss they risk is clear.

Tell patients that being right and respecting others' feelings may conflict.

3.1.2.8 Caring more for individual patients versus treating greater numbers of patients

We have left out of the above discussion providers' feelings, though these clearly may radically both determine and alter patients' outcomes. A raised eyebrow, again, may cause harm. Contrariwise, providers grimacing in their own pain in response to patients' sharing their pain may convey the most genuine concern.

Providers may come to feel more for their patients over time as if they were family. Then, they may have an ethical conflict—whether to continue to add quality to these same patients' lives by continuing to see them or to stop seeing them to see more, different patients, which in net effect could achieve greater utility or at least, so their institution, if they practice within one, may think. Their committing themselves more to one or a few patients may have more care and more respect for these patients' dignity, as might caring more for family members than for others.

This deontological value of respecting dignity is not consequence-based. Thus, these two kinds of values cannot be weighed quantitatively against each other. It may, though, be that caring and dignity for one or a few patients should justifiably outweigh utilitarian concerns though often since resources are limited, providers treating more patients will be urged as warranting greater moral weight.

I recall seeing an older patient with severe autism. He had a guardian and had been homeless for much of his life. He related how terrible this had been for him throughout every session. Once he started, he would not stop. So pressured was his speech. I could hardly get a word in edgewise.

I imagined after a time that I should be seeing him less often and, perhaps, use my skills to try to help greater numbers of other patients. We do not have endless medical resources and providers to spare, I mused. Just then, as if he had read my mind—as conceivably he may have—he said, out of the blue, that his meetings with me were the only meaningful moments he had in his life and were all he looked forward to. I continued to see him as often as I had.

Question utility. Consider giving priority to individual patients.

3.2 More controversial interventions

Many of the above interventions are controversial, but there are many, of course, more controversial than these. Here, I shall note three. They illustrate, by extension, the need for providers to at least think of considering going outside their usual "boxes"—as prescribed by both their professions and empirical evidence. This may be necessary to meet particularly the needs of patients whose symptoms make them "outliers" at the margins of more general guidance spectrums. Their needs may require *opposite approaches* for a panoply of reasons.

3.2.1 Look to the future—even with "ropes"

A first ground for considering more controversial actions may stem from looking at patients' longer-term needs and futures as opposed to only their shorter-term interests. The two may conflict. An instance causing the most anguish for providers is when patients are considering suicide but are adamant that they do not want to be admitted to a hospital (66, 67). We, and we hope they, at some level, want above all to live on and stay alive (68, 69). Nevertheless, at this same time, if providers go against their wishes and involuntarily hospitalize them, this may jeopardize these patients living on throughout their futures (70, 71).

They and we cannot know whether or not they might have a sudden, overwhelming impulse to take their lives, even if they have never had such an impulse before. Still, we may do better for these patients in the long run by not hospitalizing them under these conditions, difficult though this may be for hopefully only a short time for these patients and us (72, 73).

A patient coming to see me had suicidal thoughts. She had already bought a rope with which she could hang herself. This alone may for many or most providers tie their hands, making their hospitalizing these patients no longer discretionary since they have gone beyond just thinking how they would end their lives to acting based on this plan. She, though, did not want to be hospitalized. Thus, we came to an alternative agreement. I would call her every 4 hours the remaining day and then through subsequent days until and unless she said she needed less frequent contact. Our backup plan between these hours in case she needed me but could not reach me was to call 988 or 911 or go to an emergency room. As it turned out, we could resume a usual meeting schedule within a week and did. She, I should add, as a follow-up some time later after she was no longer seeing me called to tell me of a weekend workshop she had attended that she thought I might want to recommend to others. Her calling to tell me this seemed to me a gift like the above patient's telling me how to best hammer a nail. She appears to have flourished. She may, though, not have if I had involuntarily hospitalized her.

Think long term, value patients' wants, and perhaps, together, bear uncertainty.

3.2.2 Respect first, in spite of the possible price. The end result may paradigmatically then be optimal!

There is again an almost inviolable professional obligation to consult with families and sometimes also friends when a patient is suicidal to get greater, possibly life-saving, additional information. Providers contacting these loved ones then may or may not tell them before they ask them questions what may be the likely or possible consequences of the information that they provide—like

involuntary hospitalization. In response to this "warning", some may say nothing. Others who want to help save their loved ones' lives may then just go ahead.

A similar issue arises for forensic providers wanting to ask loved ones what they know about alleged offenders to help them determine whether, at the time of a crime, these persons were or were not criminally insane. This same warning may stymie these outside parties from speaking.

Providers always, of course, already warn patients that they may not respect their confidentiality if they think they pose an undue danger to themselves or others. Paradoxically, patients may respond to these and other such warnings by feeling *greater* trust. This greater trust may come about because providers have respected them by sharing this, particularly because they shared this, knowing that this could curb these patients' sharing of information.

Consider so informing or warning, though this could harm the patient.

3.2.3 Risking being and being perceived as paternalistic

Providers should consider helping patients whenever and in whatever way that they can (28, 74, 75). To best illustrate this, I will give examples of patients both wanting to live and wanting to die.

An elderly patient wanted to live on at any cost though he had "untreatable" cancer. He had tried three experimental treatments unsuccessfully. He then heard of still a fourth, offered in another country, but to do this, he would have to leave his children and grandchildren whom he much loved and who much loved him. He would be alone then for 3 months. His provider wondered. Should he merely respect this or should he ask, "Are you sure? Would it be okay for us to discuss this more?"

A second patient due to diabetes had lost a leg and was about to undergo surgical amputation and lose her remaining leg if she was to be able to continue to live. She preferred to die. Her provider in this case debated whether to ask her a similar question to the one posed above: "Could we discuss this more? Could we see if there might be reasons we might discover that might move you to want to continue to live?"

Both questions are "conventionally" paternalistic. They each involve these patients' providers questioning what these patients already had come to feel certain that they want, as opposed to their not questioning these patients and accepting their deciding questions wholly on their own. These providers risk these patients seeing them as disrespecting them by suggesting that these patients might want to discuss their decisions more with them. These providers asking these questions may, however, increase these patients' autonomy over the longer run. Is this then impermissibly paternalistic? Or is this not the highest standard of care?

One provider reported that he felt "weird" going this extra mile. I recall seeing a patient like the one above. She too needed a second leg amputation due to diabetes. I respected her autonomous choice to refuse a second amputation. I, decades later, *now* feel weird in a different way. I regret not questioning her more at that time.

Add to patients' thinking, whether or not this is paternalistic.

4 Conclusion

Most of the approaches presented above potentially may add to providers' skills in treating patients with mental health needs worldwide. The core challenges to providers discussed above include providers listening for their own ambiguity and reducing the risks this ambiguity may bring about. They also include offering to support patients and families to pursue whatever it is *they* want, even when, personally, providers wholly disagree (76, 77). This latter approach opposes providers always giving priority to their own moral views, and thus, their seeing their doing this as in all cases ethically preferable. General approaches highlighted are providers always validating first and even when patients verbally fight, though this effort to heal the relationship under these circumstances violates what many providers might see as a mandatory practice—setting boundaries. Specific interventions include providers abandoning neutrality to not abandon their patients emotionally. This again departs from some providers' adamant view. I suggest that providers may justifiably consider seeing patients longer even though they could instead help more patients. More extreme controversies considered here include not hospitalizing patients who are suicidal and even not calling their loved ones to get more information since either or both may in the long run *further* endanger these patients' lives. Finally, we may question our patients both when they want to live and want to die.

There are here many common ground rules to accept or reject. These may test us. They may, too, change the destinies of patients like Tina. Globally.

Author contributions

EH: Conceptualization, Formal analysis, Writing – original draft.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Author disclaimer

The opinions and assertions expressed herein are those of the author(s) and do not reflect the official policy or position of the Uniformed Services University of the Health Sciences or the Department of Defense. Neither I nor my family members have a financial interest in any commercial product, service, or organization providing financial support for this research. References to non-Federal entities or products do not constitute or imply a Department of Defense or Uniformed Services University of the Health Sciences endorsement.

References

1. Hill CE, Norcross JC. Skills and methods that work in psychotherapy: Observations and conclusions from the special issue. *Psychother (Chic)* (2023) 60 (3):407–16. doi: 10.1037/pst0000487

2. Buchman-Wildbaum T, Váradi E, Schmelowszky Á, Griffiths MD, Demetrovics Z, Urbán R. The paradoxical role of insight in mental illness: The experience of stigma and shame in schizophrenia, mood disorders, and anxiety disorders. *Arch Psychiatr Nurs* (2020) 34(6):449–57. doi: 10.1016/j.apnu.2020.07.009

3. Peluso PR, Freund R. Paradoxical interventions: A meta analysis. *Psychotherapy* (2023) 60(3):283–94. doi: 10.1037/pst0000481

4. Norcross JC, Wampold BE. A new therapy for each patient: Evidence-based relationships and responsiveness. *J Clin Psychol* (2018) 74(11):1889–906. doi: 10.1002/jclp.22678

5. Norcross JC, Lambert MJ. Psychotherapy relationships that work II. *Psychother (Chic)* (2011) 48(1):4–8. doi: 10.1037/a0022180

6. Norberg Boysen G, Nyström M, Christensson L, Herlitz J, Wireklint Sundström B. Trust in the early chain of healthcare: lifeworld hermeneutics from the patient's perspective. *Int J Qual Stud Health Well-being* (2017) 12(1):1356674. doi: 10.1080/17482631.2017.1356674

7. Bexson T. Learning to feel. New treatment for borderline personality disorder. *Ment Health Today* (2004), 16–7.

8. Gallop R. Self-destructive and impulsive behavior in the patient with a borderline personality disorder: rethinking hospital treatment and management. *Arch Psychiatr Nurs* (1992) 6(3):178–82. doi: 10.1016/0883-9417(92)90029-I

9. Pluhar E, Power S, Freizinger M, Altman W. Medical education: guidelines for effective teaching of managing challenging patient encounters. *Med Sci Educ* (2019) 29 (3):855–61. doi: 10.1007/s40670-019-00729-x

10. Hirsch CR, Meeten F, Krahé C, et al. Resolving ambiguity in emotional disorders: the nature and role of interpretation biases. *Annu Rev Clin Psychol* (2016) 12:281–305. doi: 10.1146/annurev-clinpsy-021815-093436

11. Bazan A, Kushwaha R, Winer ES, Snodgrass JM, Brakel LAW, Shevrin H. Phonological ambiguity detection outside of consciousness and its defensive avoidance. *Front Hum Neurosci* (2019) 13:77. doi: 10.3389/fnhum.2019.00077

12. Floresco SB. The nucleus accumbens: an interface between cognition, emotion, and action. *Annu Rev Psychol* (2015) 66:25–52. doi: 10.1146/annurev-psych-010213-115159

13. Neumann D, Malec JF, Hammond FM. Negative attribution bias and anger after traumatic brain injury. *J Head Trauma Rehabil* (2017) 32(3):197–204. doi: 10.1097/HTR.0000000000000259

14. Tanaka Y, Fujino J, Ideno T, Okubo S, Takemura K, Miyata J, et al. Are ambiguity aversion and ambiguity intolerance identical? A neuroeconomics investigation. *Front Psychol* (2015) 5:1550. doi: 10.3389/fpsyg.2014.01550

15. Chen JT, Lovibond PF. Threat appraisal and negative affect under ambiguity in generalised anxiety disorder. *J Anxiety Disord* (2020) 76:102299. doi: 10.1016/j.janxdis.2020.102299

16. Frank JD, Frank JB. *Persuasion and healing: A Comparative Study of Psychotherapy. 3rd ed.* Baltimore: Johns Hopkins University Press (1991).

17. Wampold BE. How important are the common factors in psychotherapy? An update. *World Psychiatry* (2015) 14:270–7. doi: 10.1002/wps.20238

18. Baier AL, Kline AC, Feeny NC. Therapeutic alliance as a mediator of change: a systematic review and evaluation of research. *Clin Psychol Rev* (2020) 82:101921. doi: 10.1016/j.cpr.2020.101921

19. Gibson S. On judgment and judgmentalism: how counselling can make people better. *J Med Ethics* (2005) 31(10):575–7. doi: 10.1136/jme.2004.011387

20. Jankowski PJ, Sandage SJ, Bell CA, Davis DE, Porter E, Jessen M, et al. Virtue, flourishing, and positive psychology in psychotherapy: an overview and research prospectus. *Psychother (Chic)* (2020) 57(3):291–309. doi: 10.1037/pst0000285

21. Foley GN, Gentile JP. Nonverbal communication in psychotherapy. *Psychiatry (Edgmont).* (2010) 7(6):38–44.

22. Saposnik G, Redelmeier D, Ruff CC, Tobler PN. Cognitive biases associated with medical decisions: a systematic review. *BMC Med Inform Decis Mak* (2016) 16(1):138. doi: 10.1186/s12911-016-0377-1

23. Featherston R, Downie LE, Vogel AP, Galvin KL. Decision making biases in the allied health professions: A systematic scoping review. *PloS One* (2020) 15(10): e0240716. doi: 10.1371/journal.pone.0240716

24. Dajani R, Mbarek H, Ismail SI, Mohammad A, Somai M. Overcoming Eurocentric bias makes for better science. *Med* (2022) 3(12):813–4. doi: 10.1016/j.medj.2022.11.007

25. Thirsk LM, Panchuk JT, Stahlke S, Hagtvedt R. Cognitive and implicit biases in nurses' judgment and decision-making: A scoping review. *Int J Nurs Stud* (2022) 133:104284. doi: 10.1016/j.ijnurstu.2022.104284

26. Hall WJ, Chapman MV, Lee KM, Merino YM, Thomas TW, Payne BK, et al. Implicit racial/ethnic bias among health care professionals and its influence on health care outcomes: A systematic review. *Am J Public Health* (2015) 105(12):e60–76. doi: 10.2105/AJPH.2015.302903

27. Croskerry P. When I say … cognitive debiasing. *Med Educ* (2015) 49(7):656–7. doi: 10.1111/medu.12670

28. Portacolone E, Johnson JK, Halpern J, Kotwal A. Seeking a sense of belonging. *Generations* (2020) 44(3):1–8.

29. Stefka J, El-Khechen D, Cain T, Blanco K, Feldmann B, Towne MC, et al. Misattributed parentage identified through diagnostic exome sequencing: Frequency of detection and reporting practices. *J Genet Couns* (2022) 31(3):631–40. doi: 10.1002/jgc4.1530

30. Middleton A, Parker M, Wright CF, Bragin E, Hurles ME. DDD Study. Empirical research on the ethics of genomic research. *Am J Med Genet A* (2013) 161A(8):2099–101. doi: 10.1002/ajmg.a.36067

31. Wright CF, Parker M, Lucassen AM. When genomic medicine reveals misattributed genetic relationships-the debate about disclosure revisited. *Genet Med* (2019) 21(1):97–101. doi: 10.1038/s41436-018-0023-7

32. Howe EG, Rosenzweig L, Shuman A. Ethical reflections on offering patients accelerated resolution therapy (ART). *Innov Clin Neurosci* (2018) 15(7-8):32–4.

33. Westby CL, Erlandsen AR, Nilsen SA, Visted E, Thimm JC. Depression, anxiety, PTSD, and OCD after stillbirth: a systematic review. *BMC Pregnancy Childbirth* (2021) 21(1):782. doi: 10.1186/s12884-021-04254-x

34. Redshaw M, Hennegan JM, Henderson J. Impact of holding the baby following stillbirth on maternal mental health and well-being: findings from a national survey. *BMJ Open* (2016) 6(8):e010996. doi: 10.1136/bmjopen-2015-010996

35. Camacho Ávila M, Fernández Medina IM, Jiménez-López FR, Granero-Molina J, Hernández-Padilla JM, Hernández Sánchez E, et al. Parents' Experiences about support following stillbirth and neonatal death. *Adv Neonatal Care* (2020) 20(2):151–60. doi: 10.1097/ANC.0000000000000703

36. Laronne A, Granek L, Wiener L, Feder-Bubis P, Golan H. "Some things are even worse than telling a child he is going to die": Pediatric oncology healthcare professionals perspectives on communicating with children about cancer and end of life. *Pediatr Blood Cancer* (2022) 69(3):e29533. doi: 10.1002/pbc.29533

37. Dddd Bedoya SZ, Fry A, Gordon ML, Lyon ME, Thompkins J, Fasciano K, et al. Adolescent and young adult initiated discussions of advance care planning: family member, friend and health care provider perspectives. *Front Psychol* (2022) 13:871042. doi: 10.3389/fpsyg.2022.871042

38. Zadeh S, Pao M, Wiener L. Opening end-of-life discussions: how to introduce Voicing My CHOiCES™, an advance care planning guide for adolescents and young adults. *Palliat Support Care* (2015) 13(3):591–9. doi: 10.1017/S1478951514000054

39. Linton SJ, Flink IK, Nilsson E, Edlund S. Can training in empathetic validation improve medical students' communication with patients suffering pain? A test of concept. *Pain Rep* (2017) 2(3):e600. doi: 10.1097/PR9.0000000000000600

40. Del Río Olvera FJ, Rodríguez-Mora Á, Senín-Calderón C, Rodríguez-Testal JF. The first session is the one that counts: An exploratory study of therapeutic alliance. *Front Psychol* (2022) 13:1016963. doi: 10.3389/fpsyg.2022.1016963

41. Pomm HA, Pomm R, Shahady E. The CALMER approach: teaching learners six steps to serenity when dealing with difficult patients. *Fam Med* (2004) 36(7):467–9.

42. Chochinov HM. Dignity and the essence of medicine: The A, B, C, and D of dignity conserving care. *BMJ* (2007) 335:184–7. doi: 10.1136/bmj.39244.650926.47

43. Frankl VE. *Man's Search for Meaning*. Boston, Mass: Beacon Press (2006).

44. Yalom ID. *Existential Psychotherapy*. New York, NY: Basic Books (1980).

45. Grassi L, Mezzich J, Nanni M, Riba MB, Sabato S, Caruso R, et al. A person-centered approach in medicine to reduce the psychosocial and existential burden of chronic and life-threatening medical illness. *Int Rev Psychiatry* (2017) 29(5):377–88. doi: 10.1080/09540261.2017.1294558

46. Schnipke B, MacKay M. Existential issues in psychotherapy. *Innov Clin Neurosci* (2023) 20(1-3):72–5.

47. Seligman MEP. Positive Psychology: A Personal History. *Annu Rev Clin Psychol* (2019) 15:1–23. doi: 10.1146/annurev-clinpsy-050718-095653

48. Valentine L, Gabbard GO. Can the use of humor in psychotherapy be taught? *Acad Psychiatry* (2014) 38(1):75–81. doi: 10.1007/s40596-013-0018-2

49. Lazarus AA. Tailoring the therapeutic relationship, or being an authentic chameleon. *Psychotherapy* (1993) 30:404–7. doi: 10.1037/0033-3204.30.3.404

50. Picton A. Work-life balance in medical students: self-care in a culture of self-sacrifice. *BMC Med Educ* (2021) 21(1):8. doi: 10.1186/s12909-020-02434-5

51. Bishop JP, Rees CE. Hero or has-been: is there a future for altruism in medical education? *Adv Health Sci Educ* (2007) 12:391–9. doi: 10.1007/s10459-007-9064-4

52. Santibañez S, Boudreaux D, Tseng GF, Konkel K. The Tzu Chi silent mentor program: application of buddhist ethics to teach student physicians empathy, compassion, and self-sacrifice. *J Relig Health* (2016) 55(5):1483–94. doi: 10.1007/s10943-015-0110-x

53. Gunderson JG. Reducing suicide risk in borderline personality disorder. *JAMA* (2015) 314(2):181–2. doi: 10.1001/jama.2015.4557

54. Carmel A, Fruzzetti AE, Rose ML. Dialectical behavior therapy training to reduce clinical burnout in a public behavioral health system. *Community Ment Health J* (2014) 50(1):25–30. doi: 10.1007/s10597-013-9679-2

55. Asai A, Maki S, Kadooka Y. Ethical reflections on the thoughts and lives of Kurosawa's doctors. *Med Humanit* (2012) 38(1):38–43. doi: 10.1136/medhum-2011-010079

56. Cassell EJ. Consent or obedience? Power and authority in medicine. *N Engl J Med* (2005) 352(4):328–30. doi: 10.1056/NEJMp048188

57. Colenbrander L, Causer L, Haire B. 'If you can't make it, you're not tough enough to do medicine': a qualitative study of Sydney-based medical students' experiences of bullying and harassment in clinical settings. *BMC Med Educ* (2020) 20(1):86. doi: 10.1186/s12909-020-02001-y

58. Datta-Barua I, Hauser J. Clinician self-disclosure in palliative care: describing a taxonomy and proposing a communication tool. *Am J Hosp Palliat Care* (2023) 40 (9):987–93. doi: 10.1177/10499091231154228

59. Patel S, Pelletier-Bui A, Smith S, Roberts MB, Kilgannon H, Trzeciak S, et al. Curricula for empathy and compassion training in medical education: A systematic review. *PloS One* (2019) 14(8):e0221412. doi: 10.1371/journal.pone.0221412

60. Chandler A. Narrating the self-injured body. *Med Humanit* (2014) 40(2):111–6. doi: 10.1136/medhum-2013-010488

61. Norman H, Marzano L, Oskis A, Coulson M. "My heart and my brain is what's bleeding, these are just cuts." An interpretative phenomenological analysis of young women's experiences of self-harm. *Front Psychiatry* (2022) 13:914109. doi: 10.3389/fpsyt.2022.914109

62. de Abreu Costa M, Moreira-Almeida A. Religion-adapted cognitive behavioral therapy: A review and description of techniques. *J Relig Health* (2022) 61(1):443–66. doi: 10.1007/s10943-021-01345-z

63. Pearce MJ, Koenig HG, Robins CJ, Nelson B, Shaw SF, Cohen HJ, et al. Religiously integrated cognitive behavioral therapy: A new method of treatment for major depression in patients with chronic medical illness. *Psychotherapy* (2015) 52 (1):56–66. doi: 10.1037/a0036448

64. Post BC, Wade NG. Religion and spirituality in psychotherapy: A practice-friendly review of research. *J Clin Psychol* (2009) 65(2):131–46. doi: 10.1002/jclp.20563

65. Zaretsky R. *The Subversive Simone Weil: A Life in Five Ideas*. Chicago, Ill: University of Chicago Press (2021).

66. Rayner G, Warne T. Interpersonal processes and self-injury: a qualitative study using Bricolage. *J Psychiatr Ment Health Nurs* (2016) 23:54–65. doi: 10.1111/jpm.12277

67. Owens C, Fox F, Redwood S, Davies R, Foote L, Salisbury N, et al. Measuring outcomes in trials of interventions for people who self-harm: qualitative study of service users' views. *BJPsych Open* (2020) 6:e22. doi: 10.1192/bjo.2019.93

68. Hume M, Platt S. Appropriate interventions for the prevention and management of self-harm: a qualitative exploration of service-users' views. *BMC Public Health* (2007) 7:9. doi: 10.1186/1471-2458-7-949

69. Sutherland O, Dawczyk A, De Leon K, Cripps J, Lewis SP. Selfcompassion in online accounts of nonsuicidal self-injury: an interpretive phenomenological analysis. *Couns Psychol Q* (2014) 27:409–33. doi: 10.1080/09515070.2014.948809

70. Hotzy F, Marty S, Moetteli S, Theodoridou A, Hoff P, Jaeger M. Involuntary admission for psychiatric treatment: Compliance with the law and legal considerations in referring physicians with different professional backgrounds. *Int J Law Psychiatry* (2019) 64:142–9. doi: 10.1016/j.ijlp.2019.03.005

71. Marty S, Jaeger M, Moetteli S, Theodoridou A, Seifritz E, Hotzy F. Characteristics of psychiatric emergency situations and the decision-making process leading to involuntary admission. *Front Psychiatry* (2019) 9:760. doi: 10.3389/fpsyt.2018.00760

72. Howe EG. When, if ever, should care providers neither contact families of suicidal patients to gain more information nor hospitalize patients? *J Clin Ethics* (2023) 34(2):117–22. doi: 10.1086/724281

73. Paris J. Suicidality in borderline personality disorder. *Med (Kaunas)* (2019) 55 (6):223. doi: 10.3390/medicina55060223

74. Jager F, Perron A. Caring as coercion: exploring the nurse's role in mandated treatment. *J Forensic Nurs* (2018) 14(3):148–53. doi: 10.1097/JFN.0000000000000207

75. Halpern J, Arnold RM. Affective forecasting: an unrecognized challenge in making serious health decisions. *J Gen Intern Med* (2008) 23(10):1708–12. doi: 10.1007/s11606-008-0719-5

76. Eubank M, Collins D, Smith N. Anxiety and ambiguity: it's all open to interpretation. *J Sport Exerc Psychol* (2002) 24(3):239–53. doi: 10.1123/jsep.24.3.239

77. Schoth DE, Liossi C. A systematic review of experimental paradigms for exploring biased interpretation of ambiguous information with emotional and neutral associations. *Front Psychol* (2017) 8:171. doi: 10.3389/fpsyg.2017.00171

frontiers | Frontiers in Public Health

TYPE Opinion
PUBLISHED 28 June 2024
DOI 10.3389/fpubh.2024.1377482

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Adam Poulsen,
The University of Sydney, Australia

*CORRESPONDENCE
Bruno Bonnechère
✉ bruno.bonnechere@uhasselt.be

RECEIVED 27 January 2024
ACCEPTED 10 June 2024
PUBLISHED 28 June 2024

CITATION
Garuma D, Lamba D, Abessa TG and Bonnechère B (2024) Advancing public health: enabling culture-fair and education-independent automated cognitive assessment in low- and middle-income countries. *Front. Public Health* 12:1377482. doi: 10.3389/fpubh.2024.1377482

Advancing public health: enabling culture-fair and education-independent automated cognitive assessment in low- and middle-income countries

Desalegm Garuma[1,2], Dheeraj Lamba[3], Teklu Gemechu Abessa[2,4] and Bruno Bonnechère[2,5,6]*

[1]Department of Psychology, College of Education and Behavorial Sciences, Jimma University, Jimma, Ethiopia, [2]REVAL Rehabilitation Research Center, Faculty of Rehabilitation Sciences, Hasselt University, Diepenbeek, Belgium, [3]Department of Physiotherapy, Faculty of Medical Sciences, Institute of Health, Jimma University, Jimma, Ethiopia, [4]Department of Special Needs and Inclusive Education, Jimma University, Jimma, Ethiopia, [5]Technology-Supported and Data-Driven Rehabilitation, Data Sciences Institute, Hasselt University, Diepenbeek, Belgium, [6]Centre of Expertise in Care Innovation, Department of PXL–Healthcare, PXL University of Applied Sciences and Arts, Hasselt, Belgium

KEYWORDS

cognition, LMIC, assessment, digital health, public health

1 Introduction

Cognitive assessment plays a crucial role in understanding cognitive functioning and detecting impairments or changes in cognitive abilities (1). It serves as an invaluable tool in evaluating an individual's cognitive status, aiding in clinical diagnoses, monitoring treatment progress, and informing intervention strategies (2). In low- and middle-income countries (LMICs), where a significant portion of the global population resides, access to reliable cognitive assessment tools is essential for identifying cognitive impairments and promoting cognitive wellbeing (3, 4).

However, the existing cognitive assessment tools used in LMICs are often limited by their heavy reliance on language, education and cultural factors (5). Traditional assessment methods typically involve standardized tests and questionnaires that are influenced by the educational background and cultural context of the individuals being assessed. These tools may inadvertently introduce bias and hinder accurate evaluation, particularly in populations with limited educational opportunities or diverse cultural backgrounds (6). This is particularly concerning given that a low level of education is associated with an increased risk of dementia, especially in LMICs (7).

The reliance on education and culture as prerequisites for cognitive assessment poses significant challenges in LMICs. Limited access to quality education and variations in cultural norms and practices can greatly impact individuals' performance on cognitive tests (8, 9). This dependence exacerbates disparities in assessing cognitive abilities, further worsening health inequalities (10, 11).

Another potential problem arises from the disparities in medical resources and access to healthcare workers in various countries, particularly in relation to mental health. There is an unequal distribution of professionally trained health workers globally, with countries facing higher disease burdens having significantly fewer resources. For instance, the African continent, experiencing 24% of the world's disease burden, struggles with access to merely 3% of trained health workers and <1% of global financial resources (12). While the allocation of resources primarily favors infectious diseases, minimal attention is given to mental health, including cognitive disorders like dementia. Furthermore, considering mental health, other factors may interfere the diagnosis and management such as stigma and awareness (13), the limited infrastructure (associated with lack of human resources as already mentioned) (14), and the low funding and policy priority (15). African civilizations stigmatize mental health disorders, resulting in low awareness, therefore, mental health services are underutilized because stigma hinders people from seeking help (16). The lack of comprehensive policies and frameworks hinders mental health care development resulting in very limited hospitals and community centers tackling mental health issues. Furthermore, these services are often concentrated in cities, making rural access problematic. To address this health inequality, technological advancements, particularly mobile phone penetration, present an opportunity. Even in LMICs, mobile phone usage is prevalent, which can facilitate access to diagnostic and treatment applications for various physical and mental health concerns, including dementia (17).

Therefore, the objective of this paper is to emphasize the urgent need for the development of automated cognitive assessment methods that are culture-fair and demand only limited education in LMICs. By exploring alternative approaches that overcome the limitations of existing assessment tools, we aim to promote equitable access to accurate cognitive assessment, leading to more effective interventions and improved cognitive health outcomes for individuals in LMIC settings.

In the following sections, we will discuss the limitations of current assessment tools in more detail, examine the potential benefits of culture-fair and demanding only limited education automated cognitive assessment, and propose a framework for developing such tools in LMICs. Ultimately, our goal is to empower healthcare practitioners, researchers, and policymakers in LMICs to address the pressing cognitive health needs of their populations effectively.

2 Challenges in implementing traditional cognitive assessment in LMICs

LMICs face several challenges when implementing traditional cognitive assessment tools, impairing their ability to accurately evaluate cognitive functioning and identify impairments. These challenges include education disparities, cultural bias, language and communication barriers, and disparities in healthcare and resource availability.

2.1 Educational disparities

In many LMICs, there are significant educational disparities, with limited access to quality education, particularly in rural or marginalized communities (18). Traditional cognitive assessment tools often rely on literacy, numeracy, and educational background, making them inadequate for individuals with limited education. This creates a barrier to accurate assessment and leads to underdiagnosis or misdiagnosis of cognitive impairments (19).

2.2 Cultural bias

Cultural factors strongly influence cognitive processes and behavior. Traditional cognitive assessment tools developed in Western settings may not adequately account for the cultural diversity present in LMICs (20). Culturally biased test items and assessment procedures can lead to unfair evaluations, failing to accurately reflect individuals' cognitive abilities and impairments. For example, western examinations use English and use idioms and references recognizable to native English speakers. The Mini-Mental State Examination (MMSE) may use idioms like "a rolling stone gathers no moss," which may confuse non-Westerners. Reading comprehension and numerical literacy are needed for tests like the Montreal Cognitive Assessment (MoCA) and MMSE. In areas with low literacy rates or educational backgrounds that differ from Western norms, test-takers may fail with these activities due to a lack of formal education. Some examinations use visual stimuli that may not be culturally meaningful across varied groups. Pattern recognition tasks containing Western symbols like clocks or animals may be alien to those from other cultures, resulting in inferior performance. Other limitations included the use of culturally specific terms or lists for memory tests. Words associated with Western food or daily objects may not resonate with people from different cultures, causing misunderstandings or poor memory performance without cognitive deficiencies.

This may undermine the validity and reliability of cognitive assessments in diverse populations.

2.3 Language and communication barriers

Many traditional cognitive assessment tools are administered in specific languages that might not be the primary language spoken by individuals in LMICs (21). Language barriers limit effective communication during assessments, resulting in compromised test performance and inaccurate cognitive evaluations (22).

2.4 Disparities in healthcare and resource availability

Healthcare disparities in LMICs, including limited funding, inadequate infrastructure, and a shortage of trained healthcare professionals, significantly impact the availability and accessibility of reliable cognitive assessment tools. The lack of resources hinders the implementation of comprehensive cognitive assessments,

leaving many individuals without access to proper evaluation and subsequent interventions.

Furthermore, the availability of standardized assessment tools is often limited in LMICs due to cost, licensing, and language barriers. Many traditional cognitive assessments are developed and marketed primarily for high-income countries, making them less accessible and affordable for LMICs. This further widens the gap in cognitive healthcare services, depriving vulnerable populations of essential cognitive assessments.

The combination of educational disparities, cultural bias, and limited healthcare resources in LMICs creates a complex environment that poses substantial challenges to the implementation of traditional cognitive assessment tools. Addressing these challenges is critical to ensure equitable access to reliable cognitive assessments and improve cognitive health outcomes in LMIC populations.

3 Existing automated cognitive assessment tools

Several promising tools are already available, or currently under validation for assessment of cognitive functions in LMICs.

3.1 Technology-based assessments

Digital platforms, such as smartphone applications and computer-based tests, offer the advantage of flexibility and scalability. These tools utilize interactive tasks, games, and simulations to assess cognitive abilities (23, 24), minimizing the dependence on educational and cultural background. Mobile technologies offer significant advantages in the realm of cognitive impairment assessment, enabling repeated and continuous evaluations while discreetly collecting additional behavioral markers. This enhanced approach allows users to observe patterns over time and promptly detect acute changes that have historically posed challenges for identification. The potential opportunities in this domain encompass the utilization of cutting-edge mobile sensors and wearable devices, ensuring enhanced reliability and validity of mobile assessments. Moreover, there is a need to establish appropriate clinical applications for mobile assessment data and integrate person-centered assessment principles alongside digital phenotyping methodologies. Embracing these advancements holds the potential to revolutionize cognitive impairment assessment and support more personalized and effective healthcare approaches (25).

3.2 Non-verbal assessments

Non-verbal assessments, such as visual-spatial tasks, pattern recognition, and cognitive games, provide a means of evaluating cognitive functioning without relying heavily on language or literacy skills (26). These assessments can be particularly useful in populations with limited education or diverse linguistic backgrounds.

3.3 Performance-based measures

Performance-based measures focus on evaluating an individual's actual abilities and skills rather than relying on self-reported or subjective measures. These measures include objective performance tasks that assess cognitive domains such as attention, memory, executive function, and processing speed (27).

3.4 Limitations and applicability of tools in LMICs

While these culture-fair and limited education demanding assessment tools show promise, their applicability in LMICs is not without limitations and need consideration of several factors.

In the context of administering assessment tools, particularly in LMICs, it is crucial to consider the role of evaluators. The person responsible for evaluating individuals using these tools is often a trained health care worker from the community, rather than a professional healthcare worker specialized in cognition.

The widespread implementation of technology-based assessments relies on the availability of reliable internet connectivity and access to appropriate devices. In resource-constrained settings, particularly in rural areas of LMICs, limited technological infrastructure may hinder the widespread adoption of these tools (28–30).

Adapting assessment tools to different cultural contexts is essential to ensure their validity and reliability. The tools should be sensitive to cultural nuances, norms, and values has these parameters significantly influence cognitive assessment Some of the most important parameters included language and interpretation, conceptual understanding, time perception, and social desirability bias (31). For example, even with literal translations, language interpretation can vary. Verbal-based examinations may misread Western words, phrases, and idioms because they may not have equivalents in other languages (20). Secondly, colors, shapes, and items can have different meanings and various symbolic meanings throughout cultures, which may affect cognitive evaluation responses to visual stimuli. Another important aspect is that some indigenous and African civilizations view time cyclically or focus on the present, while Western societies view time linearly and forward. Planning, time estimation, and sequencing assessments can be affected by time perception. Finally, many Asian cultures respect authority, which might show in subtle or indirect communication. This may cause people to give answers they think the assessor wants, skewing cognitive testing results (32).

Efforts should be made to validate and adapt these tools across diverse populations, establishing their applicability in different cultural settings. This includes the development of normative data specific to various LMIC populations.

While non-verbal assessments reduce the reliance on language, literacy skills may still play a role in some tools. Adapting assessments to different languages and ensuring they are accessible to individuals with varying literacy levels is crucial for accurate cognitive evaluations.

3.5 Gaps in the current landscape of automated cognitive assessment for LMICs

The current landscape of automated cognitive assessment tools for LMICs reveals several gaps.

First, many of the tools reviewed lack extensive validation in LMIC settings. Hence, robust validation studies are needed to establish the reliability, validity, and cross-cultural applicability of these new informatics tools in diverse populations within LMICs. For example, even if digital health solutions have shown promising results in improving health outcomes through enhanced patient engagement and adherence to prescribed therapies (33), several factors limiting the implementation of such solutions have been identified. Challenges include technological infrastructure, cultural acceptance, and the need for training among healthcare providers. Second, normative data specific to LMICs are lacking and need to be developed. This is crucial for accurate interpretation of assessment results. Population-specific norms accounting for cultural, educational, and socioeconomic factors need to be established to ensure appropriate comparisons and interpretation of cognitive assessment outcomes. Finally, the scalability and affordability of these tools in LMICs need to be considered. Ensuring that the tools are cost-effective, easily accessible, and compatible with the available resources is vital for their implementation and sustainability in LMIC settings.

4 Strategies for developing automated cognitive assessment tools

Developing assessment tools that are culture-fair and demand only limited education requires careful consideration and collaboration among researchers, practitioners, and stakeholders (34, 35). Table 1 presents potential strategies for achieving this goal. By employing these strategies, we can develop culture-fair and limited education-demanding assessment tools that accurately evaluate cognitive functioning across diverse populations in LMICs. These tools will promote equitable access to reliable cognitive assessments, leading to improved healthcare outcomes, early detection of cognitive impairments, and targeted interventions tailored to the needs of individuals in LMIC settings (36).

5 Ethical considerations

The ethical considerations associated with creating and using cognitive assessment tools that are fair across different cultures and need minimal instruction are of utmost importance in LMICs due to several reasons if we consider that health is a human right, therefore according to Ooms et al. "all people, regardless of where they live, should be entitled to the same collective efforts that can protect or improve their health" (37). The current dependence on conventional assessment techniques, which are frequently impacted by cultural and educational variables, maintains inequalities and undermines the precision of cognitive evaluations, giving rise to ethical problems regarding impartiality and fairness. The ethical obligation to ensure fair and consistent access to dependable cognitive evaluations is highlighted as a fundamental human entitlement, in line with the principle that every person, regardless of their location, should have access to collaborative endeavors that safeguard or enhance their wellbeing. Utilizing technology-based examinations provides a chance to tackle these ethical concerns, fostering equity by mitigating cultural bias and reliance on educational factors. Nevertheless, the use of these tools presents actual ethical dilemmas, encompassing concerns of infrastructure, connection, data privacy, and potential biases in algorithmic design. When implementing these tools in LMICs, it is crucial to prioritize ethical measures such as providing fair access, obtaining informed consent, being culturally sensitive, and protecting data privacy. The ethical aspects of this undertaking emphasize the requirement for a deliberate and cooperative strategy, giving importance to impartiality, inclusiveness, and regard for the varied populations being evaluated.

5.1 Equity in healthcare

Culture-fair and limited education-demanding assessments promote equitable access to reliable cognitive evaluations across diverse populations. By reducing the influence of cultural and educational factors, these tools aim to minimize disparities and ensure that individuals from different backgrounds receive fair and accurate cognitive assessments (38).

5.2 Early detection and intervention

Timely identification of cognitive impairments is crucial for implementing effective targeted preventive measurements or interventions (39, 40). Digital assessments can enable early detection of cognitive changes, allowing for targeted interventions to mitigate the impact of cognitive impairments on individuals' lives, enhance quality of life and decrease family and healthcare costs, making it ethically important, as highlighted by the WHO (41). Furthermore, cognitive tests should be accessible and fair regardless of cultural background or academic level to uphold healthcare equity. All people have the same chance of early diagnosis and treatment.

5.3 Monitoring cognitive health

Ethically, care should be constant and continuous, including cognitive health monitoring (42, 43). Regular assessment of cognitive functioning can aid in monitoring the progression of cognitive disorders, tracking treatment effectiveness, and adjusting interventions accordingly. Regular assessments provide a standardized and objective means of monitoring cognitive health across diverse populations in LMICs (44, 45).

TABLE 1 Various strategies for (1) developing automated cognitive assessment tools in LMICs and (2) address ethical and implementation challenges.

Development of cognitive assessment tools	
Points	**Description**
1. Multidisciplinary approach	Foster collaborations between experts in cognitive assessment, cultural anthropology, linguistics, and education to ensure a comprehensive understanding of cultural and educational factors that influence cognitive functioning. This multidisciplinary approach will help identify and address potential biases and develop assessment tools that are inclusive and sensitive to diverse populations.
2. Cultural adaptation	Modify existing assessment tools or develop new ones through a process of cultural adaptation and localization. This involves considering cultural norms, values, and practices during the design and implementation of assessments. This may include incorporating culturally relevant stimuli, adapting instructions and response formats, and considering the impact of cultural factors on cognitive processes.
3. Non-verbal performance-based measures	Emphasize the use of non-verbal and performance-based measures that rely less on language and educational background. This can include visual-spatial tasks, pattern recognition tasks, and performance-based activities that tap into cognitive domains without heavy reliance on verbal abilities or specific educational skills.
4. Technology-based assessment	Leverage the advancements in digital technology and mobile platforms to develop accessible and scalable assessment tools. Smartphone applications and computer-based tests can provide interactive and engaging tasks that are less influenced by cultural or educational factors. These tools can be designed to be language-independent, utilizing visual cues and intuitive interfaces.
5. Collaborative cross-cultural validation	Conduct rigorous validation studies across diverse populations within LMICs to establish the reliability and validity of culture- and education-independent assessment tools. This requires collaborative efforts involving researchers from different regions, cultural backgrounds, and language experts to ensure the tools are applicable and accurate across diverse populations.
6. Establishing normative data	Develop population-specific normative data that account for cultural, linguistic, and educational factors. This enables appropriate comparisons and interpretations of assessment results within specific LMIC populations. Collecting normative data across different regions and communities within LMICs is crucial to ensure accuracy and reliability.
7. Capacity building and training	Invest in training programs for healthcare professionals, researchers, and educators in LMICs to promote the understanding and implementation of culture- and education-independent assessment tools. This includes providing resources, workshops, and professional development opportunities to enhance skills in administering and interpreting these tools accurately.
8. User-friendly and accessible design	Ensure that the assessment tools are user-friendly, accessible, and suitable for individuals with varying levels of technological literacy and resources. Consider the availability of internet connectivity, device compatibility, and ease of administration to maximize the reach and adoption of the tools in diverse settings within LMICs.
Addressing ethical consideration	
Points	**Description**
1. Accessible and inclusive design	It is important to consider the unique needs, cultural backgrounds, and technological limitations of LMIC populations when designing cognitive assessment tools. It requires prioritizing user-centered design principles to ensure accessibility, usability, and inclusivity for diverse individuals, including those with limited technological literacy.
2. Collaboration and stakeholder engagement	It is essential to involve local communities, healthcare professionals, policymakers, and researchers in the development and implementation of cognitive assessment tools. Collaborative efforts are needed to ensure that assessments are culturally appropriate, address local concerns, and align with the specific needs of LMIC populations.
3. Data privacy and informed consent	It is also important to implement robust data privacy protocols, adhering to international standards and local regulations. Obtaining informed consent from individuals participating in cognitive assessments, clearly explaining the purpose, potential risks, and benefits of the assessments are needed. Providing individuals with control over their data and ensuring secure storage and anonymization practices are also essential.
4. Algorithmic transparency and accountability	Promoting transparency in the design and development of algorithms used in cognitive assessment tools is important. Thorough evaluation of algorithms for potential biases, regular auditing and monitoring of their performance, and striving for continuous improvement are also needed. Furthermore, it is also important to conduct external audits or independent evaluations to ensure fairness, reliability, and accuracy of the algorithms.
5. Local Capacity Building and Training	There is a need to invest in training healthcare professionals and researchers in LMICs on the ethical use and implementation of cognitive assessment tools. This includes educating them about potential biases, data privacy concerns, and the responsible deployment of these tools. Empowering local capacity ensures the ethical use of assessments and enhances the understanding of the implications and limitations of cognitive assessment technologies.
6. Regulatory frameworks and governance	Establishing clear regulatory frameworks and ethical guidelines are needed to govern the implementation and use of cognitive assessment tools in LMICs. Encouraging national or regional bodies is needed to provide guidance on ethical considerations, data protection, and quality assurance in cognitive assessment practices.

5.4 Potential biases in algorithmic design

Algorithmic bias can emerge if cognitive assessment tools are developed using datasets that are not representative of the diverse populations in LMICs. Biased algorithms may perpetuate inequalities, lead to misdiagnoses, or result in differential access to resources and interventions (46). Additionally, cultural biases in assessment tasks or scoring mechanisms can unfairly disadvantage certain groups.

6 Implementation challenges

The implementation of automated cognitive assessment tools in LMICs raises important practical considerations. Addressing these challenges is crucial to ensure the ethical and responsible deployment of cognitive assessment tools in LMICs.

6.1 Infrastructure and connectivity challenges

LMICs often face limitations in technological infrastructure and internet connectivity, particularly in rural or underserved areas. Implementing technology-based assessment tools requires reliable access to devices, internet connectivity, and a power supply (47). Unequal access to technology can exacerbate existing health disparities and impede the equitable distribution of cognitive assessments (48).

6.2 Data privacy and security

The collection, storage, and management of sensitive personal data during cognitive assessments raises concerns about data privacy and security. Safeguarding individuals' confidentiality and protecting their personal information are of paramount importance (49). Additionally, informed consent procedures should be robust, ensuring that individuals understand the purpose, risks, and benefits of cognitive assessments and have control over their data.

7 Measures to address ethical and implementation challenges

When developing novel solutions for cognitive assessment in LMICs, several crucial points must be taken into consideration. These points include accessible and inclusive design, collaboration and stakeholder engagement, data privacy and informed consent, algorithmic transparency and accountability, local capacity building and training, and the establishment of regulatory frameworks and governance, all of which are presented in Table 1. These considerations are essential to overcome challenges related to cultural, technological, and ethical factors in LMICs while ensuring the reliability and fairness of cognitive assessment tools.

8 Conclusion

Developing culture-fair and limited education demanding assessment tools for LMICs is vital for equitable access to reliable cognitive evaluations. Although promising tools have been identified, further research, validation, and adaptation are needed to address limitations and enable widespread implementation in LMIC settings.

These tools have the potential to significantly impact public health, enabling early detection and intervention for cognitive impairments. Timely identification allows for appropriate care, slowing cognitive decline, and easing the burden on healthcare systems.

Culture-fair and limited education demanding assessments also enhance accurate diagnosis and monitoring of cognitive disorders, tailoring interventions to individual needs in LMICs. This personalized approach leads to improved cognitive health outcomes.

To fully harness their potential, rigorous validation and collaboration between stakeholders are necessary. Adapting to diverse cultural contexts and developing population-specific norms ensures reliability and validity. Overcoming resource constraints and implementation challenges will ensure scalability and sustainability.

By embracing these tools, we advance public health, reduce disparities, and empower individuals to lead fulfilling lives in LMICs. Bridging the gap in cognitive assessment accessibility requires concerted efforts and a commitment to equity in healthcare.

Author contributions

DG: Writing – review & editing, Writing – original draft, Conceptualization. DL: Writing – review & editing, Supervision. TA: Writing – review & editing, Supervision. BB: Writing – review & editing, Writing – original draft, Supervision, Funding acquisition, Conceptualization.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This study was supported by the NASCERE program.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

References

1. Cleveland ML. Preserving cognition, preventing dementia. *Clin Geriatr Med.* (2020) 36:585–99. doi: 10.1016/j.cger.2020.06.003

2. Bu Z, Huang A, Xue M, Li Q, Bai Y, Xu G. Cognitive frailty as a predictor of adverse outcomes among older adults: a systematic review and meta-analysis. *Brain Behav.* (2021) 11:e01926. doi: 10.1002/brb3.1926

3. Hartle L, Charchat-Fichman H. Mild cognitive impairment history and current procedures in low- and middle-income countries: a brief review. *Dement Neuropsychol.* (2021) 15:155–63. doi: 10.1590/1980-57642021dn15-020001

4. Haile YG, Habatmu K, Derese A, Gouse H, Lawrie SM, Cella M, et al. Assessing cognition in people with severe mental disorders in low- and middle-income countries: a systematic review of assessment measures. *Soc Psychiatry Psychiatr Epidemiol.* (2022) 57:435–60. doi: 10.1007/s00127-021-02120-x

5. Ozawa S, Laing SK, Higgins CR, Yemeke TT, Park CC, Carlson R, et al. Educational and economic returns to cognitive ability in low- and middle-income countries: a systematic review. *World Dev.* (2022) 149:105668. doi: 10.1016/j.worlddev.2021.105668

6. Sania A, Sudfeld CR, Danaei G, Fink G, McCoy DC, Zhu Z, et al. Early life risk factors of motor, cognitive and language development: a pooled analysis of studies from low/middle-income countries. *BMJ Open.* (2019) 9:e026449. doi: 10.1136/bmjopen-2018-026449

7. Suemoto CK, Bertola L, Grinberg LT, Leite REP, Rodriguez RD, Santana PH, et al. Education, but not occupation, is associated with cognitive impairment: the role of cognitive reserve in a sample from a low-to-middle-income country. *Alzheimers Dement.* (2022) 18:2079–87. doi: 10.1002/alz.12542

8. Alsan M, Xing A, Wise P, Darmstadt GL, Bendavid E. Childhood illness and the gender gap in adolescent education in low- and middle-income countries. *Pediatrics.* (2017) 140:e20163175. doi: 10.1542/peds.2016-3175

9. Grande AJ, Hoffmann MS, Evans-Lacko S, Ziebold C, de Miranda CT, Mcdaid D, et al. Efficacy of school-based interventions for mental health problems in children and adolescents in low and middle-income countries: a systematic review and meta-analysis. *Front Psychiatry.* (2022) 13:1012257. doi: 10.3389/fpsyt.2022.1012257

10. Neves PAR, Barros AJD, Gatica-Domínguez G, Vaz JS, Baker P, Lutter CK. Maternal education and equity in breastfeeding: trends and patterns in 81 low- and middle-income countries between 2000 and 2019. *Int J Equity Health.* (2021) 20:20. doi: 10.1186/s12939-020-01357-3

11. Bornstein MH, Rothenberg WA, Lansford JE, Bradley RH, Deater-Deckard K, Bizzego A, et al. Child development in low- and middle-income countries. *Pediatrics.* (2021) 148:e2021053180. doi: 10.1542/peds.2021-053180

12. Global Health Observatory. *Density of physicians (total number per 1000 population, latest available year).* (2018). Available online at: https://www.who.int/gho/health_workforce/physicians_density_text/en/ (accessed June 5, 2019).

13. Thornicroft G, Sunkel C, Alikhon Aliev A, Baker S, Brohan E, El Chammay R, et al. The Lancet Commission on ending stigma and discrimination in mental health. *Lancet.* (2022) 400:1438–80. doi: 10.1016/S0140-6736(22)01470-2

14. Kleinitz P, Sabariego C, Llewellyn G, Taloafiri E, Mangar A, Baskota R, et al. Integrating rehabilitation into health systems: a comparative study of nine middle-income countries using WHO's systematic assessment of rehabilitation situation (STARS). *PLoS One.* (2024) 19:e0297109. doi: 10.1371/journal.pone.0297109

15. Wondimagegn D, Pain C, Seifu N, Cartmill C, Alemu AA, Whitehead CR. Reimagining global mental health in Africa. *BMJ Glob Health.* (2023) 8:e013232. doi: 10.1136/bmjgh-2023-013232

16. Daar AS, Jacobs M, Wall S, Groenewald J, Eaton J, Patel V, et al. Declaration on mental health in Africa: moving to implementation. *Glob Health Action.* (2014) 7:24589. doi: 10.3402/gha.v7.24589

17. Bonnechère B, Sahakian BJ. Can mobile technology help prevent the burden of dementia in low- and mid-income countries? *Front Public Health.* (2020) 8:554938. doi: 10.3389/fpubh.2020.554938

18. Local Burden of Disease Educational Attainment Collaborators. Mapping disparities in education across low- and middle-income countries. *Nature.* (2020) 577:235–238. doi: 10.1038/s41586-019-1872-1

19. Borda MG, Reyes-Ortiz C, Pérez-Zepeda MU, Patino-Hernandez D, Gómez-Arteaga C, Cano-Gutiérrez CA. Educational level and its Association with the domains of the Montreal Cognitive Assessment Test. *Aging Ment Health.* (2019) 23:1300–6. doi: 10.1080/13607863.2018.1488940

20. Khan G, Mirza N, Waheed W. Developing guidelines for the translation and cultural adaptation of the Montreal Cognitive Assessment: scoping review and qualitative synthesis. *BJPsych Open.* (2022) 8:e21. doi: 10.1192/bjo.2021.1067

21. Naqvi RM, Haider S, Tomlinson G, Alibhai S. Cognitive assessments in multicultural populations using the Rowland Universal Dementia Assessment Scale: a systematic review and meta-analysis. *CMAJ.* (2015) 187:E169–175. doi: 10.1503/cmaj.140802

22. Smith L, Leung WG, Crane B, Parkinson B, Toulopoulou T, Yiend J. Bilingual comparison of Mandarin and English cognitive bias tasks. *Behav Res Methods.* (2018) 50:302–12. doi: 10.3758/s13428-017-0871-0

23. Bonnechère B, Van Vooren M, Bier J-C, De Breucker S, Van Hove O, Van Sint Jan S, et al. The use of mobile games to assess cognitive function of elderly with and without cognitive impairment. *J Alzheimers Dis.* (2018) 64:1285–93. doi: 10.3233/JAD-180224

24. Bonnechère B, Bier J-C, Van Hove O, Sheldon S, Samadoulougou S, Kirakoya-Samadoulougou F, et al. Age-associated capacity to progress when playing cognitive mobile games: ecological retrospective observational study. *JMIR Serious Games.* (2020) 8:e17121. doi: 10.2196/17121

25. Koo BM, Vizer LM. Mobile technology for cognitive assessment of older adults: a scoping review. *Innov Aging.* (2019) 3:igy038. doi: 10.1093/geroni/igy038

26. Schumacher R, Halai AD, Lambon Ralph MA. Assessing and mapping language, attention and executive multidimensional deficits in stroke aphasia. *Brain.* (2019) 142:3202–16. doi: 10.1093/brain/awz258

27. Bonnechère B. Evaluation of processing speed of different cognitive functions across the life span using cognitive mobile games. *Games Health J.* (2022) 11:132–40. doi: 10.1089/g4h.2021.0144

28. Meherali S, Rahim KA, Campbell S, Lassi ZS. Does digital literacy empower adolescent girls in low- and middle-income countries: a systematic review. *Front Public Health.* (2021) 9:761394. doi: 10.3389/fpubh.2021.761394

29. Zhang M, Doi L, Awua J, Asare H, Stenhouse R. Challenges and possible solutions for accessing scholarly literature among medical and nursing professionals and students in low-and-middle income countries: a systematic review. *Nurse Educ Today.* (2023) 123:105737. doi: 10.1016/j.nedt.2023.105737

30. Guillaume D, Troncoso E, Duroseau B, Bluestone J, Fullerton J. Mobile-social learning for continuing professional development in low- and middle-income countries: integrative review. *JMIR Med Educ.* (2022) 8:e32614. doi: 10.2196/32614

31. Mungas D, Shaw C, Hayes-Larson E, DeCarli C, Farias ST, Olichney J, et al. Cognitive impairment in racially/ethnically diverse older adults: accounting for sources of diagnostic bias. *Alzheimers Dement (Amst).* (2021) 13:e12265. doi: 10.1002/dad2.12265

32. Rosli R, Tan MP, Gray WK, Subramanian P, Chin A-V. Cognitive assessment tools in Asia: a systematic review. *Int Psychogeriatr.* (2016) 28:189–210. doi: 10.1017/S1041610215001635

33. Bonnechère B, Kossi O, Mapinduzi J, Panda J, Rintala A, Guidetti S, et al. Mobile health solutions: an opportunity for rehabilitation in low- and middle income countries? *Front Public Health.* (2022) 10:1072322. doi: 10.3389/fpubh.2022.1072322

34. Sawatzky R, Kwon J-Y, Barclay R, Chauhan C, Frank L, van den Hout WB, et al. Implications of response shift for micro-, meso-, and macro-level healthcare decision-making using results of patient-reported outcome measures. *Qual Life Res.* (2021) 30:3343–57. doi: 10.1007/s11136-021-02766-9

35. Smith T, McNeil K, Mitchell R, Boyle B, Ries N. A study of macro-, meso- and micro-barriers and enablers affecting extended scopes of practice: the case of rural nurse practitioners in Australia. *BMC Nurs.* (2019) 18:14. doi: 10.1186/s12912-019-0337-z

36. Bates DW, Landman A, Levine DM. Health apps and health policy: what is needed? *JAMA.* (2018) 320:1975. doi: 10.1001/jama.2018.14378

37. Ooms G, Keygnaert I, Hammonds R. The right to health: from citizen's right to human right (and back). *Public Health.* (2019) 172:99–104. doi: 10.1016/j.puhe.2019.01.019

38. Chopra S, Kaur H, Pandey RM, Nehra A. Development of neuropsychological evaluation screening tool: an education-free cognitive screening instrument. *Neurol India.* (2018) 66:391–9. doi: 10.4103/0028-3886.227304

39. Carlsson CM. Management of dementia. *Continuum (Minneap Minn).* (2022) 28:885–900. doi: 10.1212/CON.0000000000001132

40. Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S, et al. Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *Lancet.* (2020) 396:413–46. doi: 10.1016/S0140-6736(20)30367-6

41. WHO. *WHO Guidelines on Ethical Issues in Public Health Surveillance.* (2017). Available online at: https://iris.who.int/bitstream/handle/10665/255721/9789241512657-eng.pdf?sequence=1 (accessed February 3, 2024)

42. Keenan AJ, Tsourtos G, Tieman J. Promise and peril-defining ethical telehealth practice from the clinician and patient perspective: a qualitative study. *Digit Health.* (2022) 8:20552076211070394. doi: 10.1177/20552076211070394

43. Gilmartin C, Arbe-Barnes EH, Diamond M, Fretwell S, McGivern E, Vlazaki M, et al. Varsity medical ethics debate 2018: constant health monitoring - the advance of technology into healthcare. *Philos Ethics Humanit Med.* (2018) 13:12. doi: 10.1186/s13010-018-0065-0

44. Chowdhary N, Barbui C, Anstey KJ, Kivipelto M, Barbera M, Peters R, et al. Reducing the risk of cognitive decline and dementia: WHO recommendations. *Front Neurol.* (2021) 12:765584. doi: 10.3389/fneur.2021.765584

45. Wang C, Song P, Niu Y. The management of dementia worldwide: A review on policy practices, clinical guidelines, end-of-life care, and challenge along with aging population. *Biosci Trends.* (2022) 16:119–29. doi: 10.5582/bst.2022.01042

46. Norori N, Hu Q, Aellen FM, Faraci FD, Tzovara A. Addressing bias in big data and AI for health care: A call for open science. *Patterns.* (2021) 2:100347. doi: 10.1016/j.patter.2021.100347

47. Byambasuren O, Sanders S, Beller E, Glasziou P. Prescribable mHealth apps identified from an overview of systematic reviews. *NPJ Digital Med.* (2018) 1:12. doi: 10.1038/s41746-018-0021-9

48. Saeed SA, Masters RM. Disparities in health care and the digital divide. *Curr Psychiatry Rep.* (2021) 23:61. doi: 10.1007/s11920-021-01274-4

49. Hussein R, Wurhofer D, Strumegger E-M, Stainer-Hochgatterer A, Kulnik ST, Crutzen R, et al. General data protection regulation (GDPR) toolkit for digital health. *Stud Health Technol Inform.* (2022) 290:222–6. doi: 10.3233/SHTI220066

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 31 July 2024
DOI 10.3389/fpubh.2024.1383512

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Axel Steiger,
Ludwig Maximilian University of Munich, Germany
Eron Grant Manusov,
The University of Texas Rio Grande Valley, United States

*CORRESPONDENCE
Hengjin Dong
donghj@zju.edu.cn

RECEIVED 26 February 2024
ACCEPTED 18 July 2024
PUBLISHED 31 July 2024

CITATION
Hu X, Jin W, Wang J and Dong H (2024) Age, period, cohort effects in trends of depressive symptoms among middle-aged and older Chinese adults.
Front. Public Health 12:1383512.
doi: 10.3389/fpubh.2024.1383512

Age, period, cohort effects in trends of depressive symptoms among middle-aged and older Chinese adults

Xiaoqian Hu[1,2], Wenxue Jin[1], Junlei Wang[1] and Hengjin Dong[2,3]*

[1]School of Politics and Public Administration, Qingdao University, Qingdao, China, [2]Center for Health Policy Studies, School of Public Health, Zhejiang University School of Medicine, Hangzhou, China, [3]The Fourth Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China

Objectives: To investigate the effects of age, period, and cohort on the trends of depression; and to examine the influence of these three temporal effects on residential disparities in depression.

Methods: Using data from the China Health and Retirement Longitudinal Study (CHARLS) during 2011 to 2020, involving 77,703 respondents aged 45 years old and above. The measurement of depressive symptoms was the score of 10-question version of the Center for Epidemiologic Studies Depression Scale (CES-D 10). The hierarchical age-period-cohort cross-classified random effects models were conducted to examine trends in depressive symptoms related to age, period and cohort.

Results: CES-D scores increased with age and slightly decreased at older age. The cohort trends mostly increased except for a downward trend among those born in 1950s. As for the period effect, CES-D scores decreased gradually from 2011 to 2013 followed by a upward trend. Rural residents were associated with higher level of depression than those live in urban area. These residence gaps in depression enlarged before the age of 80, and then narrowed. The urban–rural disparities in CES-D scores gradually diminished across cohorts, while the corresponding period-based change in urban–rural gaps was not significant.

Conclusion: When age, period, cohort factors are considered, the age effects on depression dominated, and the period and cohort variations were relatively small. The residence disparities in depression reduced with successive cohorts, more attention should be paid to the worsening depression condition of younger cohorts in urban areas.

KEYWORDS

age-period-cohort, depression, China, urban–rural disparity, life course

1 Introduction

Depression, a significant mental health concern, has attained global significance as a public health challenge. The Global Burden of Disease Study (GBD) 2019 reports that approximately 280 million individuals worldwide are affected by depression (1). Depression is expected to be the leading cause of the global burden of disease by 2030 (2). Middle-age and older adults appear to be more vulnerable to depressive disorders (3). Older people with

depression are at elevated risks for disabilities, chronic diseases and mortality, causing serious social and economic burdens (4–6). In China, more than 50.06 million people lived with depressive disorders in 2019, accounting for 17.8% of global cases (1). With the accelerated trend of population ageing in China (7), more attention to depression in later adulthood is urgently needed.

Understanding variations in late-life depression is becoming critically important, especially for the development of social security, health care delivery, and long-term care policies. Previous studies demonstrated that depression changes were related to three unique temporal factors: age, time period and cohort (8). First, as for the age effect, along with the biological and social ageing process, key predictors of depression such as social isolation and poor health are more prevalent in older age (9). Prior studies identified that depressive symptoms tend to increase as people age (10–12). Second, the period effect, referring to a range of environmental, social or economic factors during a particular period might result in depression variations. Growing economic uncertainty, public health emergencies, and health promotion programs may have effects on depressive symptoms (12, 13). Third, depression could be affected by cohort effects, reflecting the unique experiences or exposures throught the life course of distinct generations (14, 15). For example, previous studies demonstrated that prenatal exposure to the famines had proven to exert a long-lasting negative impact on mental health in later life (16–18).

Considering that age, period and cohort (APC) had distinct effects on depressive symptoms, numerous studies explored the time trends in depression (19–22), while few of them simultaneously adjusted for the age, period and cohort effects. However, failure to isolate APC trends may lead to substantial bias (23). Existing researches exploring APC trends in depression simultaneously mostly focused on Western countries with conflicting results. A Germany study identified a U-shaped cohort trend and a decreasing period trend on depression (11). Another study analyzed depression variations among older Canadians and demonstrated an declined trend in depressive symptoms with age, a non-linear increasing trend across successive birth cohorts and a non-significant fluctuated trend with period (24). To our knowledge, few studies simultaneously investigated the APC trends in depression among Chinese older population. A Chinese study focused on incidence trends of major depressive disorder using the GBD 2017 data, and reported a basically increasing trend in incidence of major depressive disorder (MDD) with age, a largely decline over time, and an inverted U-shaped pattern across cohorts (25). While this study employed estimated data and examined the impact of age on the incidence of MDD by 5-year age intervals (e.g., incidence of MDD for 60-64-year-old age group) rather than 1-year age intervals, thus the estimation of APC effects could be further evaluated in much detail with population-based data. Meanwhile, China has undergone a tremendous societal transition and a remarkable economic expansion, Chinese population have been exposed to unique and powerful social forces (26). It is anticipated that these societal changes would have distinct impacts on the health of populations in different periods and birth cohorts, which may differ from what has been observed in western countries. However, large-scales studies on the APC trends in depression among the Chinese population are scarce and are looking worthy of further investigation.

Urban–rural gaps in depression had attracted plenty of attention in the worldwide (27, 28). In developed countries, studies have revealed a higher prevalence of depressive symptoms among urban residents compared to their rural counterparts (29). While several studies conducted in China consistently demonstrated that rural residents exhibited higher levels of depressive symptoms than those residing in urban areas (30, 31), which probably results from the urban–rural disparities in socio-economic factors, health systems, social support and social participation for a long history (32, 33). Given that rapid urbanization process in China, the urban–rural disparities in depression may also change. However, few studies have examined the effects of age, period and cohort on residence differences in depression using comprehensive temporal models. Wu identified that the urban–rural disparities widen among younger Chinese older adults, and narrowed after the age of 80 (34). While this study did not identify time period and birth cohort trends. Further investigation is needed to explicate the impact of APC on the trends of urban–rural gaps in depressive symptoms.

This study therefore has two main objectives. Firstly, to investigate the effects of age, period, and cohort on the trends of depression; Secondly, to assess the influence of these three temporal effects on residential disparities in depression. We utilized data from the China Health and Retirement Longitudinal Study (CHARLS) and adopted hierarchical APC cross-classified random effects models (HAPC-CCREM) to achieve these objectives.

2 Materials and methods

2.1 Data source

We used data from the CHARLS, which was a panel survey of Chinese residents aged 45 and above. The main goal of CHARLS is to provide a high quality nationally representative sample of Chinese residents' information to serve the needs of scientific research on health, economic position, and quality of life as people age. More details about CHARLS data was introduced by Zhao previously (35). CHARLS used a stratified (by *per capita* GDP of urban districts and rural counties) multi-stage (county-level, neighborhood-level, household-level, and respondent-level) proportionate to population size (PPS) random sampling method to control the quality and representativeness of the samples (details about sampling design of the CHARLS were shown in https://charls.pku.edu.cn/en/About/Sample.htm). The CHARLS National Baseline Survey was launched in 2011, covering more than 17,000 respondents from 150 counties and 450 communities (villages) of 28 provinces (autonomous regions and municipalities) in China. Four follow-up surveys with replacements for deceased samples were conducted in 2013, 2015, 2018, and 2020. The survey encompassed a comprehensive collection of data, including demographics, income and assets, health status, cognitive abilities, family structure, healthcare utilization and costs, job status and history, insurance and biomarker. The CHARLS had been approved by Biomedical Ethics Review Committee of Peking University.

2.2 Study samples

The CHARLS contains both nationally representative cross-sectional and longitudinal samples. Until now, CHARLS conducted about ten years including middle-aged and older Chinese people

across successive cohorts, which provided the possibility for exploring the effects of age, period, cohort on depression trends. Five-wave data (2011, 2013, 2015, 2018, and 2020) was used in our analysis. Firstly, 92,733 samples aged 45 and over were involved in our analysis. Then, 6 respondents older than 105 years old were excluded due to self-reported age after 105 years is not reliable (36). Finally, after exclusion of samples with missing values in the measures of depression, we obtained 77,703 respondents as the final sample size. Detailed description of the sample selection is shown in Supplementary Figure S1. In order to reduce the potential bias of excluding the missing data, we performed multiple imputation on CES-D scores and results were not substantially different from the analyses without imputation (details were shown in Supplementary Tables S2, S3 and Supplementary Figures S2, S3).

2.3 Variables

2.3.1 Depressive symptoms

The 10-question version of the Center for Epidemiologic Studies Depression Scale (CES-D 10) was used in CHARLS questionnaires to measure depressive symptoms of the respondents (details were shown in Supplementary Table S1). The CES-D 10 is a self-report scale designed by Radloff to assess the severity of depressive symptoms among the general population (37), which was demonstrated by numerous studies to have good reliability and validity in different cultures worldwide (38–40). The respondents were asked to report the frequency of 10 depressive symptoms in the past week on a four-point scale, including rarely (<1 day), some days (1–2 days), occasionally (3–4 days), and most of the time (5–7 days). For eight negative symptoms (such as felt lonely), these four options were assigned as 0, 1, 2, and 3 in turn. For two positive symptoms (such as felt hopeful), the coded reversed as 3, 2, 1, and 0. The sum of the 10 items were CES-D scores in our research. It ranged from 0 to 30, with high value referring to serve depression (Chronbach's alpha = 0.815) (41).

2.3.2 Age, period, and cohort

Age, in other words chronological age, was years since birth, ranging from 45 to 105 in our analyses. The age variable was transformed by subtracting the value from the grand mean and further being divided by ten for ease of interpretation of the intercept values (8). Period referring to the year in which the interview conducted, which included 2011, 2013, 2015, 2018 and 2020. The cohort classification was based on the year of birth of the participants. In order to ensure a sufficient sample size, individuals born before 1938 or after 1969 were grouped separately (42). Subsequently, the remaining birth cohorts were grouped into three-year intervals. The cohort variable was treated as a continuous measure (43), with the oldest cohort coded 1 and the youngest cohort coded 12.

2.3.3 Covariates

Residence, the main stratification factor, indicated the respondents' living region (urban or rural) at the survey. It was categorized based on the classification established by the National Bureau of Statistics of the People's Republic of China. Specifically, a code of 0 denoted the household was in an urban area, while a code of 1 denoted the household was in a rural region.

Due to depressive symptoms were affected by many factors, we included several demographic characters, socioeconomic status (SES) and health status as covariates (9, 41). Demographic characters included sex (male, and female), co-residence (alone, and with others) and marital status (with spouse, and without spouse). Respondents who were married with spouse and cohabited were coded as "with spouse," those divorced, widowed, and never married were coded as "without spouse." SES included education level (illiterate, primary, secondary or above) and working status (not currently working, and currently working). Education level identified the highest level of education that the respondent completed. Working status indicated whether the respondent engaged in any work in the past year. Respondents' health status was measured by activities of daily living (ADL) disability, which was the number of 6-item (bathing, dressing, eating, getting in/out of bed, using the toilet, and controlling urination) that participants cannot perform independently.

2.4 Statistical methods

We applied a descriptive statistics to summarize the depressive symptoms and other confounding factors for every wave. Thereafter, we fit hierarchical age-period-cohort cross-classified random effect regression models (HAPC-CCREM) to examine the age, period, and cohort effects on depression simultaneously (8). HAPC-CCREM used two-level model to estimate APC effects, where age was assumed to have fixed effect in the first level, and periods and cohorts were estimated as random effects in the second level (44). In order to solve the classical APC identification problem, the HAPC model used different temporal grouping for the age, period, and cohort components. On the one hand, birth cohorts were defined by 3-year intervals to break the linear dependence among three temporal dimensions. On the other hand, the nonlinear transformation method recommended applying a parametric nonlinear transformation (e.g., polynomials) to at least one of the APC dimensions in order to break their linear relationships. Coupled with prior researches highlighting the non-linear effect of age on mental health (44–46), we therefore conducted models of CES-D scores as a quadratic function of age.

In the development of each model, CES-D scores were regressed on age in linear and squared terms and other confounding variables were included as needed. The coefficients of the cohort period, and residence were permitted to have random effects (44), thereby enabling a comprehensive exploration of the period-based and cohort-based variations in the urban–rural disparities of depressive symptoms.

The model was specified in the following form:

Level-1 Model:

$$CES-D_{ijk} = \beta_{0jk} + \beta_1 Age_{ijk} + \beta_2 Age_{ijk}^2 + \beta_{3jk} Res_{ijk} + \sum_{p=4}^{P} \beta_p X_{pijk} + e_{ijk}, e_{ijk} \sim N\left(0, \sigma^2\right)$$

where $CES-D_{ijk}$ describes scores of CES-D for respondent i (for $i = 1, 2, \ldots, n_{jk}$) within period j (for $j = 1, 2, \ldots, 5$) and cohort k (for $k = 1, 2, \ldots, 11$); β_{0jk} is the intercept indicating the average CES-D score for the reference group at the mean age interviewed within a specific period j and cohort k; Age and Age^2 denote age and

age-squared, respectively, where Age is centered around its grand mean (divided by 10);β_1 and β_2 denote the fixed coefficients for age; *Res* denotes residence;β_{3jk} denotes the random coefficients for residence; X_p represents other individual-level variables, including interaction between age and residence, to explore how the urban–rural disparity in depression varied with age and confounding factors. β_p denotes fixed coefficients for covariates; P is the maximum number of covariates included; e_{ijk} represents an individual-level random error term.

Level-2 Model:

$$\beta_{0jk} = \gamma_0 + u_{0j} + v_{0k}$$

$$\beta_{3jk} = \gamma_3 + u_{3j} + v_{3k}$$

β_{0jk} denotes a random intercept, which specifies that the overall mean across from different periods and cohorts. γ_0 represents the overall mean or intercept; u_{0j} is the overall period effect, which is the average of the residual random coefficients for period j across all cohorts; v_{0k} is the overall cohort effect, which is the average of the residual random coefficients for cohort k across all periods. β_{3jk} denotes the random coefficients for residence; γ_3 represents the fixed effects of residence. To investigate whether urban–rural disparities in CES-D scores differ across periods or cohorts, we specify that coefficients have period effects (u_{3j}), and cohort effects (v_{3k}). In our analysis, the random variance components associated with the intercept and coefficients, which are attributed to specific periods and cohorts, are assumed to have multivariate normal distributions (44).

Utilizing a combination of two-level models, we formulated six distinct analyses to investigate the comprehensive impacts of age, period, and cohort on depression trends, as well as the change of urban–rural disparities in depression with age, period and cohort. Model 1 explored the net effects of APC on CES-D scores using age and age-squared as fixed effects and period and cohort as random effects. From Model 2 to Model 4, residence, interaction between age and residence, confounding variables were added successively to explore their potential effects on CES-D scores. In Model 5, the random effect of residence coefficient was added to explore the period-based and cohort-based trends of urban–rural disparities in CES-D scores. Model 6 added covariates on the basis of Model 5 to form a full model. Estimated CES-D scores were displayed in figures from selected models to illustrated the trends. Analyses were carried out utilizing SAS PROC MIXED (18). Bayesian Information Criterion (BIC) served as a metric to compare the fitness among models, the smaller BIC value indicating the better model fit (36). All analyses were weighted using individual sample weights, adjusted for non-response.

3 Results

3.1 Basic characteristics of samples

Table 1 showed the basic characteristics of samples from 2011 to 2020. The total number of participants were 77,703, with an average age of 60.07 years old. Nearly 60% of the individuals live in rural area. Most of the respondents lived with others and married. Around one-fifth respondents were illiterate. The mean CES-D score for all participants was 8.25, with a range of 7.83 to 8.64 across the five surveys.

3.2 Overall age-period-cohort trends in CES-D scores

Table 2 showed the estimates of fixed effects of all individual-level covariates and random-effect variance components. When period and cohort effects were taken into consideration, the age effect on CES-D scores was curvilinear (coef. For age = 0.585, $p < 0.001$; coef. For age^2 = −0.103, $p < 0.001$). That is CES-D scores increased with age before 90 years old then slightly decreased (Figure 1A). Relative to the age effect, the period and cohort effect were relatively small. The cohort effects were more relevant to the explanation of changes in CES-D scores than period effects (coef. for period = 0.079, $p = 0.086$; coef. for cohort = 0.041, $p = 0.042$). As for cohort effects, CES-D scores increased in the older cohorts born before 1950, followed by a slight downward trend for those born between 1950 and 1959, while increased again thereafter (Figure 1B). In terms of period effects, the estimated CES-D scores decreased from 2011 to 2013, followed by a increasing trend (Figure 1C). Other covariates suggested that female and less educated people tended to have more depressive symptoms. Those lived with spouse had a relatively lower CES-D scores than counterparts who were not married. Physically healthier individuals had fewer depressive symptoms either.

3.3 Age-period-cohort trends of urban–rural disparities in CES-D scores

Model 2 indicated that rural residence on average had significant higher CES-D scores relative to those live in urban area (coef. = 2.080, $p < 0.001$), when period and cohort effects were taken into account. For the interaction terms in Model 3 indicated that the urban–rural differentials in CES-D scores varied significantly as people get older (coef. for age = 0.303, $p < 0.001$; coef. for age^2 = 0.145, $p < 0.001$). Urban residents experienced a continuous upward trend in CES-D scores with age. The CES-D scores of rural residents increased rapidly before 80, and then decreased gradually with age. As a result, urban residents' advantage on CES-D scores over rural counterpart widened and then narrowed (Figure 2A).

When major correlates of depression were held constant in Model 4, the residence effects in CES-D scores still persisted but decreased in size, indicating that some of the effect of urban–rural gaps were mediated by covariates. The interaction effect of residence with age remained significant when confounding variables were controlled.

Model 5 demonstrated that there seemed to be significant cohort changes in levels of depression and urban–rural inequalities net of age effects, period changes, and other covariates. Figure 2B illustrated that the urban–rural disparities in CES-D scores gradually diminished across cohorts. Specifically, urban and rural residents experienced a similar upward trend in CES-D scores for those born before 1950. For those rural residents born after 1950, the CES-D scores decreased with

TABLE 1 Basic characteristics of samples in five surveys.

Variables	ALL (*N* = 77,703)	2011 (*N* = 14,413)	2013 (*N* = 14,922)	2015 (*N* = 16,818)	2018 (*N* = 15,675)	2020 (*N* = 15,875)
Age	60.07 ± 9.43	58.91 ± 9.50	59.29 ± 9.33	59.41 ± 9.52	60.54 ± 9.29	62.09 ± 9.15
Sex						
Male	37,894 (48.8)	6,951 (48.2)	7,296 (48.9)	8,357 (49.7)	7,678 (49.0)	7,612 (47.9)
Female	39,809 (51.2)	7,462 (51.8)	7,626 (51.1)	8,461 (50.3)	7,997 (51.0)	8,263 (52.1)
Residence						
Urban	31,256 (40.2)	5,799 (40.2)	5,977 (40.1)	6,740 (40.1)	6,382 (40.7)	6,358 (40.1)
Rural	46,447 (59.8)	8,614 (59.8)	8,945 (59.9)	10,078 (59.9)	9,293 (59.3)	9,517 (59.9)
Co-residence						
Alone	4,750 (6.1)	838 (5.8)	665 (4.5)	770 (4.6)	1,237 (7.9)	1,240 (7.8)
With others	72,953 (93.9)	13,575 (94.2)	14,257 (95.5)	16,048 (95.4)	14,438 (92.1)	14,635 (92.2)
Marital status						
With spouse	68,063 (87.6)	12,625 (87.6)	13,192 (88.4)	14,822 (88.1)	13,730 (87.6)	13,694 (86.3)
Without spouse	9,640 (12.4)	1788 (12.4)	1730 (11.6)	1996 (11.9)	1945 (12.4)	2,181 (13.7)
Education						
Illiterate	17,537 (22.6)	3,839 (26.6)	3,583 (24.0)	3,758 (22.3)	3,144 (20.1)	3,213 (20.2)
primary	34,019 (43.8)	5,706 (39.6)	6,042 (40.5)	7,599 (45.2)	7,325 (46.7)	7,347 (46.3)
Secondary or above	26,144 (33.6)	4,868 (33.8)	5,297 (35.5)	5,458 (32.5)	5,206 (33.2)	5,315 (33.5)
Missing^	3 (<0.1)	–	–	3 (<0.1)	–	–
Working status						
Not currently working	25,712 (33.4)	5,281 (37.2)	4,789 (32.6)	5,336 (32.3)	5,159 (33.0)	5,147 (32.4)
Currently working	51,218 (66.6)	8,911 (62.8)	9,907 (67.4)	11,176 (67.7)	10,497 (67.0)	10,727 (67.6)
Missing	773 (1.0)	221 (1.5)	226 (1.5)	306 (1.8)	19 (0.1)	1 (<0.1)
ADL limitations	0.34 ± 0.91	0.33 ± 0.95	0.29 ± 0.83	0.35 ± 0.92	0.32 ± 0.89	0.39 ± 0.97
CES-D score	8.25 ± 6.32	8.44 ± 6.37	7.83 ± 5.78	7.92 ± 6.39	8.43 ± 6.49	8.64 ± 6.46

CES-D, the center for epidemiologic studies depression scale. ADL, activities of daily living.
Data are presented as mean ± standard deviation or *n* (%). ^ Missing data were excluded from other percentage calculation.

successive cohorts. While the estimated CES-D scores of urban residents were relatively stable for 1950s, then increased for those born between 1960 and 1968, which leading to a reduction in the urban–rural gaps in the CES-D scores for those younger cohorts. The insignificant coefficients of period shown in level 2 indicated that the urban–rural disparities were constant during the last 10 years when age effects, cohort effects and other factors were controlled (Figure 2C).

4 Discussion

Using a large, nationally longitudinal dataset of middle-aged and older Chinese people, we applied HAPC-CCREM to explore age, period, cohort trends of depressive symptoms, simultaneously. CES-D scores increased with age and slightly decelerated at older age. The cohort trends largely increased except for a downward among those born in 1950s. Rural residents were associated with higher CES-D scores than those live in urban area. These residence gaps in CES-D scores enlarged before the age of 80, and then gradually narrowed. The urban–rural disparities in CES-D scores diminished across cohorts, while the corresponding period-based change in urban–rural gaps was not significant.

These findings of the distinct effects of age, period and cohort on depression trends among Chinese middle-aged and older adults indicated the importance to test APC effects simultaneously in studies of health changes. In consistent with prior studies (21, 44), our findings indicated depressive symptoms increased with age at a decreasing growth rate. Specifically, age-based depression level demonstrated a upward trend before the age of 90, then followed by a slight downward trend. The age effects were strong and independent of period and cohort effects. With age, people are exposed to more risk factors related to depression, including physiological and social factors. Regarding physiological aspects, older people are more likely to suffer from physical illnesses and disability, resulting in an increased risk of depression (31, 47). Social factors such as retirement and widowhood often separated older adults from mainstream society and social network, leading

TABLE 2 Hierarchical age-period-cohort cross-classified random-effects model estimates of CES-D scores.

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Fixed effects												
Intercept	7.977***	0.144	6.937***	0.145	6.870***	0.147	6.670***	0.195	6.896***	0.139	6.677***	0.186
Age	0.585***	0.060	0.581***	0.049	0.430***	0.057	−0.091	0.071	0.507***	0.071	−0.077	0.077
Age^2	−0.103***	0.031	−0.094***	0.029	−0.018	0.035	−0.090**	0.035	−0.061*	0.031	−0.093*	0.038
Residence (urban = 0)			2.080***	0.045	2.205***	0.058	1.535***	0.058	2.116***	0.139	1.522***	0.115
Age* Residence					0.303***	0.051	0.144***	0.049			0.115	0.075
Age^2 * Residence					−0.145***	0.041	−0.151***	0.039			−0.130***	0.049
Sex (male = 0)							1.457***	0.045			1.454***	0.045
Education (illiterate = 0)												
Primary							−0.500***	0.061			−0.504***	0.061
Secondary or above							−1.616***	0.066			−1.622***	0.066
Marital status (with spouse = 0)							1.280***	0.079			1.280***	0.079
Co-residence (alone = 0)							−0.064	0.105			−0.067	0.105
Working status (no = 0)							−0.036	0.050			−0.036	0.050
ADL limitations							2.072***	0.025			2.072***	0.025
Variance components												
Period												
Intercept	0.079	0.058	0.086	0.062	0.086	0.063	0.076	0.056	0.060	0.046	0.051	0.040
Residence									0.037	0.034	0.026	0.025
Cohort												
Intercept	0.041*	0.024	0.023	0.015	0.025	0.016	0.053*	0.029	0.062*	0.033	0.071*	0.039
Residence									0.116*	0.059	0.041	0.028
Model fit												
BIC	493220.2		491077.6		491050.2		470347.0		491027.4		470327.2	

CES-D, the center for epidemiologic studies depression scale. SE, standard error. ADL, activities of daily living. BIC, Bayesian Information Criterion. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

10.3389/fpubh.2024.1383512

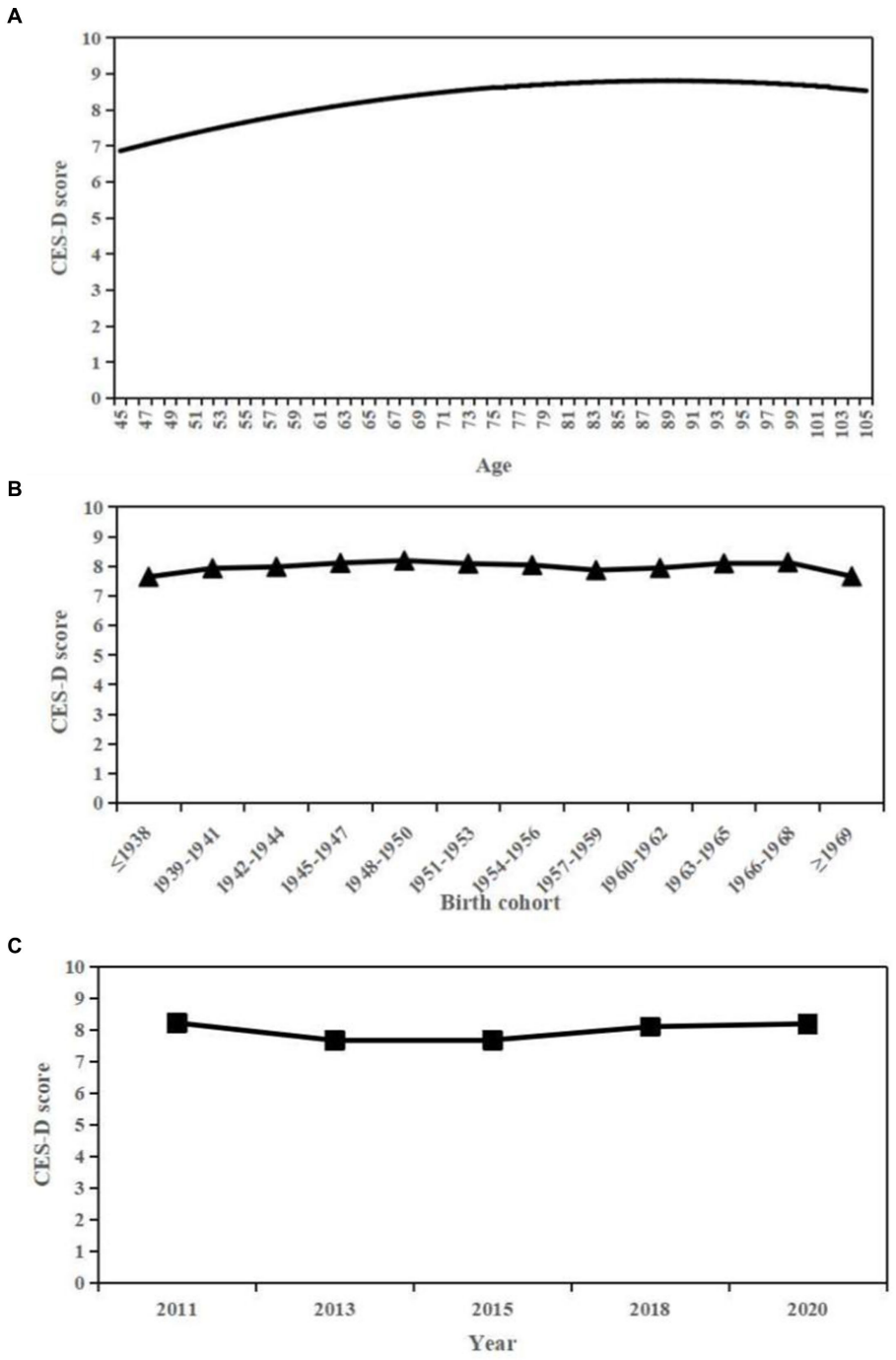


FIGURE 1
Overall age, period, and cohort effects on CES-D scores. **(A)** Age. **(B)** Cohort. **(C)** Period.

people in later adulthood to be more vulnerable to depressive symptoms (48). Similarly, an American study used more than 30 years of depressive symptom assessments from the Baltimore Longitudinal Study of Aging and observed that the CES-D scores increased at the older adulthood (49). While the slight decreasing trends of depressive symptoms at advanced age we found may partly be explained by selective survival effect (44). Those nonagenarians and centenarians who could survive to advanced ages suffering possible hardships in early life stage were likely to be more robust and more optimistic towards life (50).

Regarding cohort effects, the level of depression increased in the older cohorts born before 1950, followed by a downward trend for those born between 1950 and 1959, while increased again among the younger cohorts. These cohort trends in depression might indicate the potential impacts of societal shifts and individual life experiences on depression (21, 51). The increasing

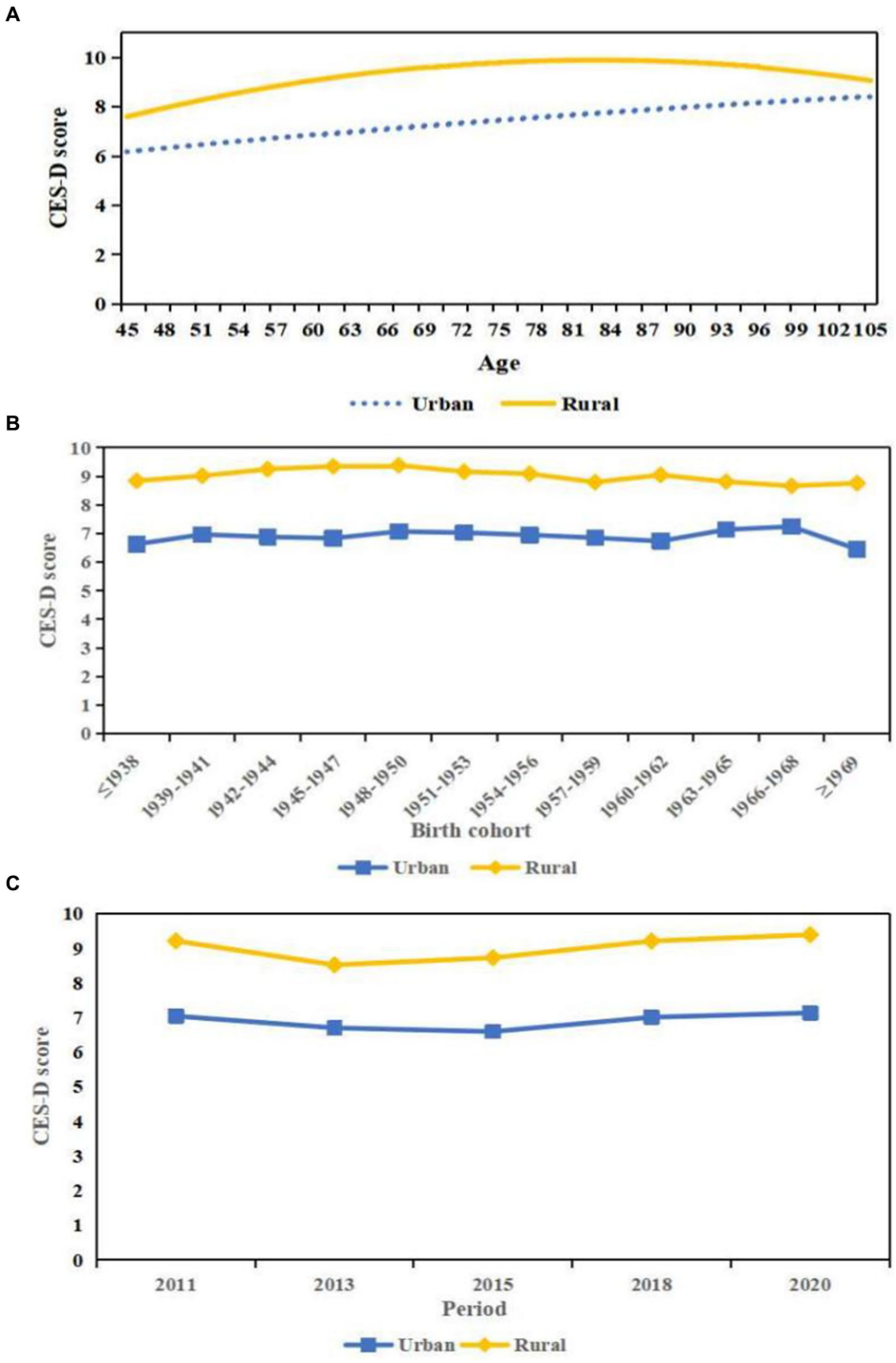


FIGURE 2
Predicted age, period, and cohort trends in the urban–rural disparity in CES-D scores. **(A)** Age. **(B)** Cohort. **(C)** Period.

trend of depression observed among older cohorts before 1950 may due to the long-lasting damage affected by the social and political disturbances, such as the War of Resistance (1931–1945) and the Chinese Civil War (1927–1949). Researches demonstrated that early life adversity would have profound effects on mental health during the whole life (52, 53). The highest CES-D scores were shown in the 1948–1950 cohort, who experienced war and chaos at birth, and the Great Chinese Famine (1959–1961) in childhood. At their youth, they may lose opportunities to receive education further during the Cultural Revolution (1966–1976). These historical events they suffered through the lifespan might be risk factors for depression (25). After the establishment of the People's Republic of China in 1949, a downward trend for those born between 1950 and 1959 were shown. The decreasing trend

in depression among 1950s cohorts was in line with another Chinese study, which identified the incidence of major depressive disorder began to decline from those born after 1950 (25). Unlike the older cohorts, their childhood was in a relative peaceful condition. Meanwhile, the Anti-illiteracy Movements and mass public health campaigns were launched since the 1950s, which might play an important role in the improvement in mental health (43, 51). The increasing trend in depression among younger cohorts were consistent with prior studies (11, 24, 25). The possible reason may be that the younger cohorts might be exposed to increasing depression risks (11, 22). The growing economic uncertainly, accelerated pace of modern life, along with increasingly stress might result in a higher possibility of anxiety, disappointment, and distress, which may increase the levels of depression among younger cohorts (54, 55). Moreover, the rise of individualistic and consumer culture emphasizing extrinsic values (like money and fame) might also lend some explanation for the observed mostly rising trends in depression (54). The period effects on overall depression net of age and cohort effects were insignificant, indicating the depression variations mainly explained by age and cohort effects from 2011 to 2020. While this result is different from some previous studies, in which significant decreasing or increasing trends in depressive symptoms over time period were found, especially among older adults (11, 56). Therefore, further observation of period-based trend on depression in a longer period may detect a more accurate picture.

We identified that urban–rural gaps in depression enlarged with age and then narrowed after 80, which was similar with the findings from Wu et al. (34). They used data from the China Family Panel Studies from 2016 to 2020, and also found that residence gaps in CES-D scores widen among younger samples, then narrowed among older samples. The increasing disparities in depression among younger samples was mainly due to a faster increase in depression among rural residents. The possible reason maybe that for these middle-aged and 'young old'(younger than 80 years old), the urban residents could get better health services, retirement welfare, and various forms of support form their children and society than those in rural area (21). Meanwhile, some studies suggested that rural older adults in China had server disabilities and worse health status than urban older adults (57, 58), which were identified as risk factors of depression (47). The narrowed urban–rural disparities in depression on advanced age might be explained by the selective survival effect. Due to the urban–rural gaps in development level, those individuals who could survive to advanced age suffering possible hardships in rural area were likely to be more robust than peers live in urban area (36, 59). Those weaker individuals in rural with worse living conditions and health services could rarely reach old ages. Regarding cohort effects, a narrowing trend on urban–rural gaps in depression was detected. However, this trend was partly due to the upward trends in depressive symptoms of urban residents among younger cohorts, and partly due to the downward trends in depression among rural residents. Therefore, more attention should be given to younger cohorts in urban area to prevent or postpone the onset of depression and to ensure they obtain adequate care.

The present study has some limitations. Firstly, due to the limitations of the data, the earliest and latest birth cohorts may not fully represent the age distribution, which may bias the estimation for age and cohort trends. Future studies encompassing a longer period may be able to provide a more precise and comprehensive understanding of the age span of depressive changes. Secondly, we focused on basic effects of APC and individual variables on depression. Effects from social network, lifestyles, and life events could be further explored. Thirdly, CES-D was a self-reported retrospective indicator of depression, which may be susceptible to cognitive biases (21). Future studies could use clinician-administered scales to explore the APC effects on depression further.

In conclusion, this study provides an overview of age, period and cohort trends on depression and examine these three temporal effects on urban–rural residence disparities in depression among middle-aged and older Chinese adults. Given the observed stronger age effects on depression, coupled with the increasing depression trend among younger cohorts, the rapid ageing of the Chinese population will inevitably lead to an increase in the number of older adults with depression. In addition, the increase in depressive symptoms among urban younger cohorts also requires policy attention. Intervention issues should be taken to prevent or postpone the onset of depression.

Data availability statement

Publicly available datasets were analyzed in this study. The datasets can be found here: https://charls.charlsdata.com/pages/data/111/en.html.

Ethics statement

The studies involving humans were approved by Biomedical Ethics Review Committee of Peking University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

XH: Writing – original draft, Writing – review & editing. WJ: Writing – review & editing. JW: Writing – review & editing. HD: Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This study was funded by the National Social Science Foundation of Shandong (grant number 22DRKJ01).

Acknowledgments

The authors would like to express their gratitude to the participants and researchers involved in the China Health and Retirement Longitudinal Study (CHARLS), as well as to CHARLS for providing data.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2024.1383512/full#supplementary-material

References

1. Institute of Health Metrics and Evaluation. GBD results. (2020). Available at: https://vizhub.healthdata.org/gbd-results/ (accessed January 4, 2024).

2. Malhi GS, Mann JJ. Depression. *Lancet*. (2018) 392:2299–312. doi: 10.1016/S0140-6736(18)31948-2

3. World Health Organization. Depression and other common mental disorders. Geneva: Global Health Estimates (2017).

4. Walker ER, Mcgee RE, Druss BG. Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. *JAMA Psychiatry*. (2015) 72:334–41. doi: 10.1001/jamapsychiatry.2014.2502

5. Haigh EAPP, Bogucki OEM, Sigmon STP, Blazer DGMP. Depression among older adults: a 20-year update on five common myths and misconceptions. *Am J Geriatr Psychiatry*. (2018) 26:107–22. doi: 10.1016/j.jagp.2017.06.011

6. König H, König H, Konnopka A. The excess costs of depression: a systematic review and meta-analysis. *Epidemiol Psychiatr Sci*. (2019) 29:e30. doi: 10.1017/S2045796019000180

7. Hu X, Gu S, Zhen X, Sun X, Gu Y, Dong H. Trends in activities of daily living disability among Chinese older adults from 1998 to 2018: an age-period-cohort analysis. *Eur J Ageing*. (2022) 19:1167–79. doi: 10.1007/s10433-022-00690-6

8. Yang Y, Land KC. Age-period-cohort analysis: New models, methods, and empirical applications. Boca Raton: Taylor & Francis (2013).

9. Handing EP, Strobl C, Jiao Y, Feliciano L, Aichele S. Predictors of depression among middle-aged and older men and women in Europe: a machine learning approach. *Lancet Reg Health Eur*. (2022) 18:100391. doi: 10.1016/j.lanepe.2022.100391

10. Beller J, Regidor E, Lostao L, Miething A, Kröger C, Safieddine B, et al. Decline of depressive symptoms in Europe: differential trends across the lifespan. *Soc Psychiatry Psychiatr Epidemiol*. (2021) 56:1249–62. doi: 10.1007/s00127-020-01979-6

11. Beller J. Age-period-cohort analysis of depression trends: are depressive symptoms increasing across generations in Germany? *Eur J Ageing*. (2022) 19:1493–505. doi: 10.1007/s10433-022-00732-z

12. Bai R, Dong W, Peng Q, Bai Z. Trends in depression incidence in China, 1990-2019. *J Affect Disord*. (2022) 296:291–7. doi: 10.1016/j.jad.2021.09.084

13. Pescosolido BA, Halpern-Manners A, Luo L, Perry B. Trends in public stigma of mental illness in the US, 1996-2018. *JAMA Netw Open*. (2021) 4:e2140202. doi: 10.1001/jamanetworkopen.2021.40202

14. Stephan A, Strobl R, Schwettmann L, Meisinger C, Ladwig K, Linkohr B, et al. Being born in the aftermath of world war ii increases the risk for health deficit accumulation in older age: results from the kora-age study. *Eur J Epidemiol*. (2019) 34:675–87. doi: 10.1007/s10654-019-00515-4

15. Zhang P, Lv Y, Li Z, Yin Z, Li F, Wang J, et al. Age, period, and cohort effects on activities of daily living, physical performance, and cognitive functioning impairment among the oldest-old in China. *J Gerontol A Biol Sci Med Sci*. (2020) 75:1214–21. doi: 10.1093/gerona/glz196

16. Huang C, Phillips MR, Zhang Y, Zhang J, Shi Q, Song Z, et al. Malnutrition in early life and adult mental health: evidence from a natural experiment. *Soc Sci Med*. (2013) 97:259–66. doi: 10.1016/j.socscimed.2012.09.051

17. Lumey LH, Stein AD, Susser E. Prenatal famine and adult health. *Annu Rev Public Health*. (2011) 32:237–62. doi: 10.1146/annurev-publhealth-031210-101230

18. Brown AS, van Os J, Driessens C, Hoek HW, Susser ES. Further evidence of relation between prenatal famine and major affective disorder. *Am J Psychiatry*. (2000) 157:190–5. doi: 10.1176/appi.ajp.157.2.190

19. Sullivan KJ, Liu A, Dodge HH, Andreescu C, Chang CH, Ganguli M. Depression symptoms declining among older adults: birth cohort analyses from the rust belt. *Am J Geriatr Psychiatry*. (2020) 28:99–107. doi: 10.1016/j.jagp.2019.06.002

20. Wild B, Herzog W, Schellberg D, Lechner S, Niehoff D, Brenner H, et al. Association between the prevalence of depression and age in a large representative German sample of people aged 53 to 80 years. *Int J Geriatr Psychiatry*. (2012) 27:375–81. doi: 10.1002/gps.2728

21. Zhang Y, Zhao M. Gender disparities and depressive symptoms over the life course and across cohorts in China. *J Affect Disord*. (2021) 295:620–7. doi: 10.1016/j.jad.2021.08.134

22. Twenge JM. Time period and birth cohort differences in depressive symptoms in the u.s., 1982-2013. *Soc Indic Res*. (2015) 121:437–54. doi: 10.1007/s11205-014-0647-1

23. Yang Y, Land KC. Age-period-cohort analysis of repeated cross-section surveys: fixed or random effects? *Sociol Methods Res*. (2008) 36:297–326. doi: 10.1177/0049124106292360

24. Yang G, D'Arcy C. Age, period and cohort effects in depression prevalence among Canadians 65+, 1994 to 2018: a multi-level analysis. *Int J Soc Psychiatry*. (2023) 69:885–94. doi: 10.1177/00207640221141785

25. He J, Ouyang F, Li L, Qiu D, Li Y, Xiao S. Incidence trends of major depressive disorder in China: an age-period-cohort modeling study. *J Affect Disord*. (2021) 288:10–6. doi: 10.1016/j.jad.2021.03.075

26. Gao M, Kuang W, Qiu P, Wang H, Lv X, Yang M. The time trends of cognitive impairment incidence among older Chinese people in the community: based on the CLHLS cohorts from 1998 to 2014. *Age Ageing*. (2017) 46:787–93. doi: 10.1093/ageing/afx038

27. Peen J, Schoevers RA, Beekman AT, Dekker J. The current status of urban-rural differences in psychiatric disorders. *Acta Psychiatr Scand*. (2010) 121:84–93. doi: 10.1111/j.1600-0447.2009.01438.x

28. Xin Y, Ren X. Predicting depression among rural and urban disabled elderly in China using a random forest classifier. *BMC Psychiatry*. (2022) 22:118. doi: 10.1186/s12888-022-03742-4

29. Purtle J, Nelson KL, Yang Y, Langellier B, Stankov I, Diez Roux AV. Urban-rural differences in older adult depression: a systematic review and meta-analysis of comparative studies. *Am J Prev Med*. (2019) 56:603–13. doi: 10.1016/j.amepre.2018.11.008

30. Qin X, Wang S, Hsieh C. The prevalence of depression and depressive symptoms among adults in China: estimation based on a national household survey. *China Econ Rev*. (2018) 51:271–82. doi: 10.1016/j.chieco.2016.04.001

31. Li L, Liu J, Xu H, Zhang Z. Understanding rural-urban differences in depressive symptoms among older adults in China. *J Aging Health*. (2016) 28:341–62. doi: 10.1177/0898264315591003

32. Chiao C, Weng L, Botticello AL. Social participation reduces depressive symptoms among older adults: an 18-year longitudinal analysis in Taiwan. *BMC Public Health*. (2011) 11:292. doi: 10.1186/1471-2458-11-292

33. Li L, Wu C, Gan Y, Qu X, Lu Z. Insomnia and the risk of depression: a meta-analysis of prospective cohort studies. *BMC Psychiatry*. (2016) 16:375. doi: 10.1186/s12888-016-1075-3

34. Wu Y, Su B, Chen C, Zhao Y, Zhong P, Zheng X. Urban-rural disparities in the prevalence and trends of depressive symptoms among Chinese elderly and their associated factors. *J Affect Disord*. (2023) 340:258–68. doi: 10.1016/j.jad.2023.07.117

35. Zhao Y, Hu Y, Smith JP, Strauss J, Yang G. Cohort profile: the China health and retirement longitudinal study (CHARLS). *Int J Epidemiol*. (2014) 43:61–8. doi: 10.1093/ije/dys203

36. Zeng Y, Vaupel JW, Xiao Z, Zhang C, Liu Y. Sociodemographic and health profiles of the oldest old in China. *Popul Dev Rev*. (2002) 28:251–73. doi: 10.1111/j.1728-4457.2002.00251.x

37. Radloff LS. The ces-d scale: a self-report depression scale for research in the general population. *Appl Psychol Meas*. (1977) 1:385–401. doi: 10.1177/014662167700100306

38. Kliem S, Beller J, Tibubos AN, Zenger M, Schmalbach B, Brähler E. A reanalysis of the center for epidemiological studies depression scale (ces-d) using non-parametric item response theory. *Psychiatry Res*. (2020) 290:113132. doi: 10.1016/j.psychres.2020.113132

39. Chen H, Mui AC. Factorial validity of the center for epidemiologic studies depression scale short form in older population in China. *Int Psychogeriatr*. (2014) 26:49–57. doi: 10.1017/S1041610213001701

40. van de Rest O, van der Zwaluw N, Beekman AT, de Groot LC, Geleijnse JM. The reliability of three depression rating scales in a general population of dutch older persons. *Int J Geriatr Psychiatry*. (2010) 25:998–1005. doi: 10.1002/gps.2449

41. Lei X, Sun X, Strauss J, Zhang P, Zhao Y. Depressive symptoms and SES among the mid-aged and elderly in China: evidence from the China health and retirement longitudinal study national baseline. *Soc Sci Med*. (2014) 120:224–32. doi: 10.1016/j.socscimed.2014.09.028

42. Lin S, Beck AN, Finch BK, Hummer RA, Master RK. Trends in US older adult disability: exploring age, period, and cohort effects. *Am J Public Health*. (2012) 102:2157–63. doi: 10.2105/AJPH.2011.300602

43. Chen F, Yang Y, Liu G. Social change and socioeconomic disparities in health over the life course in China: a cohort analysis. *Am Sociol Rev*. (2010) 75:126–50. doi: 10.1177/0003122409359165

44. Yang Y. Social inequalities in happiness in the United States, 1972 to 2004: an age-period-cohort analysis. *Am Sociol Rev*. (2008) 73:204–26. doi: 10.1177/000312240807300202

45. Zhang L. An age-period-cohort analysis of religious involvement and adult self-rated health: results from the USA, 1972-2008. *J Relig Health*. (2017) 56:916–45. doi: 10.1007/s10943-016-0292-x

46. Hu X, Gu S, Zhen X, Sun X, Gu Y, Dong H. Trends in cognitive function among Chinese elderly from 1998 to 2018: an age-period-cohort analysis. *Front Public Health*. (2021) 9:753671. doi: 10.3389/fpubh.2021.753671

47. Blazer D. Depression in late life: review and commentary. *J Gerontol A Biol Sci Med Sci*. (2003) 58:249–65. doi: 10.1093/gerona/58.3.m249

48. Feng Z, Jones K, Phillips DR. Social exclusion, self-rated health and depression among older people in China: evidence from a national survey of older persons. *Arch Gerontol Geriatr*. (2019) 82:238–44. doi: 10.1016/j.archger.2019.02.016

49. Sutin AR, Terracciano A, Milaneschi Y, An Y, Ferrucci L, Zonderman AB. The trajectory of depressive symptoms across the adult life span. *JAMA Psychiatry*. (2013) 70:803–11. doi: 10.1001/jamapsychiatry.2013.193

50. Danner DD, Snowdon DA, Friesen WV. Positive emotions in early life and longevity: findings from the nun study. *J Pers Soc Psychol*. (2001) 80:804–13. doi: 10.1037/0022-3514.80.5.804

51. Guo S, Zheng XY. New evidence of trends in cognitive function among middle-aged and older adults in China, 2011-2018: an age-period-cohort analysis. *BMC Geriatr*. (2023) 23:498. doi: 10.1186/s12877-023-04166-9

52. Xie P, Wu K, Zheng Y, Guo Y, Yang Y, He J, et al. Prevalence of childhood trauma and correlations between childhood trauma, suicidal ideation, and social support in patients with depression, bipolar disorder, and schizophrenia in southern China. *J Affect Disord*. (2018) 228:41–8. doi: 10.1016/j.jad.2017.11.011

53. Zhang Z, Gu D, Hayward M. Early life influences on cognitive impairment among oldest old Chinese. *J Gerontol B Psychol Sci Soc Sci*. (2008) 63:S25–33. doi: 10.1093/geronb/63.1.s25

54. Eckersley R, Dear K. Cultural correlates of youth suicide. *Soc Sci Med*. (2002) 55:1891–904. doi: 10.1016/S0277-9536(01)00319-7

55. Deborah D. Urban consumer culture. The. *China Q*. (2005) 183:692–709. doi: 10.1017/S0305741005000421

56. Yan X, Lin S, Li J, Wei Y, Pei L. Temporal trends in the incidence of depressive disorders across China, Japan, and South Korea: an age-period-cohort analysis for the global burden of disease study 2019. *Int J Ment Health Addict*. (2023). doi: 10.1007/s11469-023-01220-w

57. Zimmer Z, Wen M, Kaneda T. A multi-level analysis of urban/rural and socioeconomic differences in functional health status transition among older Chinese. *Soc Sci Med*. (2010) 71:559–67. doi: 10.1016/j.socscimed.2010.03.048

58. Yu P, Song X, Shi J, Mitnitski A, Tang Z, Fang X, et al. Frailty and survival of older Chinese adults in urban and rural areas: results from the Beijing longitudinal study of aging. *Arch Gerontol Geriatr*. (2012) 54:3–8. doi: 10.1016/j.archger.2011.04.020

59. Zimmer Z, Martin LG, Nagin DS, Jones BL. Modeling disability trajectories and mortality of the oldest-old in China. *Demography*. (2012) 49:291–314. doi: 10.1007/s13524-011-0075-7

frontiers | Frontiers in Medicine

TYPE Original Research
PUBLISHED 01 August 2024
DOI 10.3389/fmed.2024.1427745

OPEN ACCESS

EDITED BY
Waseem Jerjes,
Imperial College London, United Kingdom

REVIEWED BY
Ghassan Hamadeh,
Central Michigan University, United States
Matej Stuhec,
University of Maribor, Slovenia

*CORRESPONDENCE
Dilek Örüm
✉ dr.dilekulukan@gmail.com

RECEIVED 20 May 2024
ACCEPTED 24 July 2024
PUBLISHED 01 August 2024

CITATION
Örüm D (2024) Attitudes and psychotropic preferences of primary care providers in the management of mental disorders: a web-based survey.
Front. Med. 11:1427745.
doi: 10.3389/fmed.2024.1427745

Attitudes and psychotropic preferences of primary care providers in the management of mental disorders: a web-based survey

Dilek Örüm*

Psychiatry, Elazığ Fethi Sekin City Hospital, Elazığ, Türkiye

Background: Many variables may affect the approaches of primary care providers (PCPs) to mental disorders. This study was aimed at reaching PCPs actively practicing in Turkey through a web-based survey and determining their practices and attitudes regarding mental disorders.

Methods: This was a web-based, quantitative, cross-sectional, primary care approach-based observational survey.

Results: Data from 454 PCPs (213 male, 241 female; 321 general practitioners, 133 family medicine specialists) were examined. In-service training in psychiatry ($p<0.001$), using classification criteria when evaluating mental disorders ($p<0.001$), and experience in diagnosing mental disorders ($p=0.003$) were more prevalent among family medicine specialists than general practitioners. Regardless of specialization status, PCPs reported the most difficulty diagnosing bipolar disorder (62.33%) and following-up alcohol/drug use disorder (52.20%). Significant differences in the use of psychotropic medications were observed between general practitioners and family medicine specialists. While the rate of direct referral to psychiatry without intervening in certain situations was higher among general practitioners, variety of psychotropic medication use were also more evident among them. Misinformation that antidepressants cause forgetfulness, numbness, suicide, and addiction was prevalent among all PCPs. Those who had in-service training in psychiatry had significantly more experience in using classification criteria, diagnosing and starting treatment for mental disorders, using psychotropic medications, and encountering suicide-related situations ($p<0.05$). Binary logistic regression analysis demonstrated that psychiatry in-service training experience can improve the use of classification criteria, suicide detection, antidepressant choice in anxiety, and understanding the addictive nature of antidepressants (Sensitivity=88.6%; Specificity=98.3%; Beginning block –2 Log likelihood 628.946, overall p value < 0.001; Block one –2 Log likelihood 141.054[a], Cox & Snell R^2=0.659, Nagelkerke R^2=0.878; Hosmer and Lemeshow Test p=0.938).

Conclusion: This study makes significant contributions to the literature by discussing the subject in detail and comparing general practitioners and family medicine specialists. Regardless of their specialty status, PCPs' knowledge about mental disorders needs to be improved. In-service psychiatry training is one of the tools that can be used for this purpose.

KEYWORDS

family medicine, primary care, prescription practice, psychotropic preferences, treatment attitude, general practitioner

Introduction

Mental healthcare is a fundamental human right, and mental health is an integral part of life. It surrounds our entire lives by affecting our emotions, thoughts, and behaviors, and supports our social and economic development. A person with adequate mental health establishes positive relationships, achieves a sense of belonging, copes with stressful conditions, quickly adapts to new ideas and changes, receives training on various subjects, acquires new skills, becomes aware of his/her abilities, has goals, and cares about the well-being of himself/herself and others (1, 2). Conditions resulting from deterioration of mental health constitute a significant portion of the global burden of disease. According to the World Mental Health Report (3), in 2019, worldwide, one in eight people suffers from a mental disorder. Of the 970 million people living with mental disorders, 31% has anxiety spectrum disorders, 28.9% has depression spectrum disorders, 4.1% has bipolar spectrum disorders, and 2.5% has schizophrenia spectrum disorders. Suicide accounts for more than one in every 100 deaths globally and for every death by suicide there are more than 20 suicide attempts. Mental disorders are the leading cause of years lived with disability, accounting for one in every 6 years lived with disability globally. According to 2019 data, 39.0% of the global burden of mental disorders in disability-adjusted life years is depressive disorders, 22.0% is anxiety disorders, 11.7% is schizophrenia, and 6.5% is bipolar disorder (3). Overall, mental health issues have significant financial repercussions. Health care expenses are frequently far outweighed by productivity losses and other indirect costs to society (4). In this respect, the management of mental disorders has a significant effect on quality-adjusted life years (5). Although there is a bidirectional relationship between mental and physical health, prioritizing other medical diseases before mental health is a common practice, and community-based mental health care is routinely neglected in mental health budgets (6).

Diagnosis and treatment of anxiety and depression spectrum disorders, which constitute more than three-fifths of the global burden of mental disorders, are essential and important (3). Mental disorders that may present with psychotic symptoms, such as bipolar and schizophrenia spectrum disorders primarily affect the working-age population and in cases of acute exacerbation, they may cause serious harm to the individual and his/her environment (7). Suicide, affects people and their families from all countries and contexts, and at all ages, continues to be an important problem. All these psychiatric conditions are waiting to be solved for all humanity, especially middle-income countries (3).

Primary care services are the first units where people experiencing symptoms of mental disorders and patients diagnosed with mental disorders can be followed-up and treated. In addition, subthreshold symptoms of mental disorders can be detected in some patients who visit primary care providers (PCPs) with general medical conditions other than symptoms of mental disorders. Since patients with subthreshold mental disorders have poor disease perception, it is important to inquire about or screen for symptoms of mental disorders in these patients (8). Kessler et al. (9) reported that the diagnosis of mental disorders by PCPs was under 10.0%, demonstrating the need for careful evaluation of the mental status of primary care patients. In primary care, suprathreshold and subthreshold mental disorders constitute a significant portion of morbidity (8, 9). However, due to a number of circumstances, such as ignoring symptoms of mental disorders, somatic presentation of symptoms, lack of adequate training, poor levels of diagnosis by PCPs, limited access to psychosocial and pharmaceutical therapy, stigmatization, self-stigmatization, and patient overload, a sizeable portion of cases remains undiagnosed, untreated, or treated improperly (10). The increasing recognition of the impact of mental disorders on the global burden of disease has led to the development of primary care programs for mental disorder management in high-income countries. Despite model interventions, gaps in this field, which includes detection, treatment and follow-up processes, persist all over the world, even in high-income countries (11, 12). In addition to access barriers, more than 75.0% of people in low- and middle-income countries receive no treatment of mental disorders (12). Factors such as psychotropic medication selection, possible combinations, possible side effects, dosage, route and time of administration, duration of use, non-mental health diseases and interactions with medications, absence of effective collaboration between different healthcare specialists, and lack of evidence-based guideline-consistent care are the main source of gaps in the management of mental disorders (13, 14).

There are various studies examining PCP approaches to mental issues. In the majority of these studies, psychotropic-prescribing patterns of PCPs were examined using a small number of variables (15, 16). There has not been enough studies evaluating the approach of PCPs to mental disorders and psychotropic preferences together. This study, which also included the impact of in-service training in psychiatry and primary care specialization, aimed to examine the sociodemographic and educational characteristics, experience and attitudes regarding mental disorders, and psychotropic-use characteristics of PCPs actively working in Turkey through a web-based survey. Our hypothesis was that training characteristics and current working conditions of PCPs affect their approaches to mental disorder management. The results of this study may pave the way for organizing in-service training related to mental disorders for PCPs.

Materials and methods

This was a web-based, quantitative, cross-sectional, and observational survey.

It is almost impossible to reach PCPs face to face, working anywhere in Turkey to gather their opinions on the current issue and create a road map for mental disorder management. In addition, people may avoid participating in scientific research during the day or during working time, or even if they participate, they may be careless in complying with research instructions. Internet offers various tools that we can use to overcome these difficulties that may be encountered in scientific data collection processes. Web-based survey tools such as Google Forms make it much easier to reach target groups in research. These forms can be created and applied free of charge (17). The current survey was conducted by distributing a web questionnaire to PCPs included in WhatsApp and Yahoo groups representative of the PCPs working actively in Turkey.

Sampling frame and general information

In Turkey, one graduates as a general practitioner after 6 years of medical school education. To become a family medicine specialist, it

is necessary to pass the medical specialization exam. Physicians who choose family medicine in the medical specialization exam participate in a three-year residency training period. During these 3 years, family medicine residents learn the principles of their own discipline and also rotate in the departments of internal medicine, gynecology and obstetrics, child health and diseases, general surgery, and psychiatry. At the end of this period, the family medicine resident who completed the medical specialization thesis receives the title of family medicine specialist. The population of this study included all PCPs working actively in Turkey. All PCPs included in this study were medical doctors, and clinicians actively working in family health center which is a health institution where primary care services are provided by one or more PCPs and family health personnel.

In this study, the concept of PCP refers to all general practitioners and family medicine specialists. In-service training in psychiatry does not refer to academic and paid training, but rather training provided free of charge to physicians by the state. As it is known, the names of the same medical diseases can be written differently in classification systems. Mental disorders were evaluated using the concept of spectrum in order to make it easier for PCPs who do not use a classification system or use a different classification system to understand the same thing.

In this study, experiences of PCPs in diagnosing mental disorders were inquired. The purpose here is to inquire whether the PCP has considered the diagnosis of any mental disorder. It is appreciated that it is not possible to determine the accuracy of diagnostic thought and experience retrospectively. That is, the expression "diagnosis experience" in this study was used to describe patients who were currently diagnosed with a mental disorder and patients who were considered to be diagnosed with a mental disorder by their PCP, even though they did not have a history of mental disorder.

In Turkey, PCPs provide services almost all over the country, including rural settlements such as villages and towns, while physicians who specialize in a particular field provide services in larger and urban settlements. In order to facilitate access to medical treatments for people living in rural areas, PCPs have been given a wide range of prescribing opportunities. Antidepressant (e.g., tricyclic antidepressants, selective serotonin reuptake inhibitors, serotonin-norepinephrine reuptake inhibitors, noradrenaline and specific serotoninergic antidepressants), antipsychotic (e.g., typical antipsychotics, atypical antipsychotics), benzodiazepine, and psychostimulant medications can be prescribed by PCPs. Psychostimulants such as methylphenidate are included in the red prescription drug class. Drugs with addictive effects such as biperiden and benzodiazepine are in the green prescription drug class. Long-acting injectable antipsychotic medications (e.g., haloperidol decanoate, paliperidon palmitate once monthly and three monthly, aripiprazole maintena) can be prescribed by PCPs during the maintenance treatment if reported by a psychiatry specialist.

The "*e-nabiz*" application, created by the Ministry of Health of the Republic of Turkey and made available to all physicians in Turkey, guides PCPs in follow-up and treatment processes. *e-nabiz*, the national patient registration system, is a database where all medical histories of patients (surgery, hospitalization, laboratory, imaging, allergies, diagnoses, medications, vaccination schedule, cancer screening data, intensive care information, reports, emergency notes) can be accessed (18).

In-service training is training provided to individuals who are employed and continue to work, to enable them to acquire the necessary knowledge, skills and attitudes related to their duties (19). In-service training increases the knowledge and skills of PCPs with regard to the management of mental disorders (20).

Sample size calculation

According to the data of the Ministry of Health of the Republic of Turkey, the number of PCPs actively working in Turkey is estimated to be approximately 29,970 as of 2024 (21). This means 380 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value (22).

Development of questionnaire

The survey draft was created by the conductor of the study, who has 6 years of experience in psychiatry practice. All questions had neutral content and leading questions were avoided. The survey language was Turkish. While creating the survey, literature, primary care training in the Turkey, and clinical experiences were taken into consideration. The survey was piloted and further revised based on feedback from 10 PCPs. The survey, created via Google Form (Alphabet, Googleplex, Mountain View, California, United States) (17), was delivered to participants working in the Turkey via WhatsApp and Yahoo groups. WhatsApp and Yahoo groups, which are thought to have similar ones in every country, were unofficial, but they were the groups in which the majority of PCPs in Turkey participated. These groups were created by administrators of the country's federation of primary care associations, and joining the group required a reference from an administrator in the group.

Recruitment procedure and consent process

An initial e-mail/message and up to five e-mail/message reminders were sent to WhatsApp and Yahoo groups. In this e-mail/message, it was clearly stated that the survey aimed to reach PCPs actively working in Turkey and examine their approaches to mental disorders. In order to facilitate the participation of the sample group in the survey, it was emphasized that the estimated completion time of the survey was 4 or 5 min. Participants were directed to the Google Form research page by clicking on the "https://" link of this web-based form. The survey's landing page included information such as the name of the survey, purpose of the study, ethics committee approval information, information that the data will be kept confidential, information that the currently working PCPs will participate in the study, the survey does not contain questions that may cause personal sensitivity, and average filling time of the survey. Following this information, the question "Do you approve of participating in this study?" was asked, and those who answered "yes" included in the study. Participants were not able to skip items except for the gender

question. The survey was open from November 1, 2023 – March 31, 2024.

Inclusion and exclusion criteria

Those who were not actively practicing primary care were not included in the study. There was no age or gender limit. Each response was evaluated on its own. It was planned to exclude discordant respondents from the study. However, it was observed that the participants answered all questions completely and harmoniously, including gender. Therefore, no data were excluded from the study.

Dependent and independent variables

In this study, the relationship of many dependent variables including using classification criteria of psychiatry, experiences with mental disorder diagnoses, approach to the psychotic disorder, experiences of using psychotropic medications, psychotropic preferences in symptoms of mental disorders, information about antidepressants, and, independent variables including gender and specialization status were examined and the findings were demonstrated through tables.

Ethical approval and funding

Ethical approval was obtained from the Firat University Non-invasive Research Ethics Committee and the 1964 Declaration of Helsinki was complied with (Date: 27/09/2023; Number: 2023/13-23). All respondents provided their consent for the information provided to be used for research purposes. No funding was declared.

Statistical analysis

The web-based survey was hosted on the Google Forms platform, a secure end-to-end encrypted form builder for free to create online forms that capture classified data (17). Data was downloaded and stored on Microsoft Excel, an application for managing online surveys and databases. All analyses were performed using IBM SPSS Statistics version 22.0. Descriptive statistics and continuous variables were given as mean ± standard deviation, and categorical variables were given as frequency and percentage. The Chi-square test was used to compare the categorical data between the groups and genders. Binary logistic regression analysis was used in variable prediction. In regression analysis, the grouping variable (general practitioner & family medicine specialist or have psychiatry in-service training and do not have psychiatry in-service training) was accepted as the dependent variable, and, clinical variables as the independent variable. Binary logistic regression analysis was applied separately for each independent variable, and those with significant p values were included in the model. Variables that did not contribute sufficiently to the model were subsequently excluded. The suitability of the independent variable to the model was checked through the Hosmer and Lemeshov test. A p value of less than 0.05 was set as statistical significance.

Results

Sociodemographic and training characteristics of PCPs

Data from 454 PCPs (213 males, 241 females) were examined. While the mean age was ($n = 454$) 37.24 ± 3.36 years (min 26 years, max 57 years), the mean duration of primary care practice ($n = 454$) was 7.34 ± 5.58 years (min 1 year, max 25 years). There were 96 PCPs (21.14%) whose average number of admission to outpatient clinic per day was between 0 and 20, of 166 PCPs (36.56%) was between 21 and 50, and of 192 PCPs (42.30%) was more than 50. Average number of patients examined daily in outpatient clinic was similar between genders ($p = 0.067$).

The distribution of sociodemographic and training characteristics of PCPs by gender was shown in Table 1.

Clinical approaches and experiences of PCPs

In primary care practice, 267 PCPs (58.8%) considered a diagnosis of depression spectrum disorder in at least one patient; 378 PCPs (83.3%) considered a diagnosis of anxiety spectrum disorder in at least one patient; 271 PCPs (59.7%) considered a diagnosis of panic disorder in at least one patient; 156 PCPs (34.4%) considered an obsessive-compulsive spectrum disorder diagnosis in at least one patient; 12 PCPs (2.6%) considered a diagnosis of schizophrenia spectrum disorder in at least one patient; 53 PCPs (11.7%) considered a diagnosis of bipolar spectrum disorder in at least one patient; 156 PCPs (34.4%) considered a diagnosis of alcohol/drug use disorder in at least one patient; 108 PCPs (23.8%) considered a diagnosis of sexual function disorder in at least one patient; 109 PCPs (24.0%) considered a diagnosis of attention-deficit hyperactivity disorder in at least one patient; 153 PCPs (33.7%) considered a diagnosis of postpartum depression in at least one patient.

Three hundred seventeen PCPs (69.8%) had encountered a request for a rest request report at least once. One hundred forty-eight PCPs (32.6%) had examined a patient with suicidal thoughts/behavior/attempts at least once. In patients presenting with insomnia complaints, 238 PCPs (52.4%) initiated the treatment themselves, 187 PCPs (41.2%) referred them to a psychiatrist, 13 PCPs referred them to neurology (2.86%), and 16 PCPs referred them to pulmonologists (3.52%).

The distribution of comfort with mental disorder diagnoses of PCPs and their approach to psychotic disorder by gender was shown in Table 1.

Psychotropic use characteristics of PCPs

In primary care practice, 51 PCPs (11.2%) prescribed mood stabilizers to at least one patient; 116 PCPs (25.6%) had prescribed benzodiazepine to at least one patient; 32 PCPs (7.0%) had prescribed psychostimulants to at least one patient; 57 PCPs (12.6%) prescribed modafinil to at least one patient.

Two hundred ninety-one PCPs (64.1%) were prescribing all psychotropic medications reported by a psychiatrist, 78 PCPs (17.18%) were prescribing psychotropic medications other than red prescription

TABLE 1 Sociodemographic, training characteristics and experiences, attitudes of PCPs in terms of gender.

Variables		Male (n = 213) Mean ± SD and n(%)	Female (n = 241) Mean ± SD and n(%)	p value
Age (years)		37.80 ± 6.06	36.75 ± 8.32	0.131[a]
Duration of primary care practice (years)		7.83 ± 5.32	6.92 ± 5.78	0.084[a]
Specialization status	General practitioner	196 (92.0)	125 (51.9)	<0.001*[b]
	Family medicine specialist	17 (8.0)	116 (48.1)	
Place of working	Urban	95 (44.6)	104 (43.2)	0.756[b]
	Rural	118 (55.4)	137 (56.8)	
Psychiatry in-service training		101 (47.4)	133 (55.2)	0.098[b]
Using classification criteria	No	65 (30.5)	35 (14.5)	<0.001*[b]
	DSM	64 (30.0)	142 (58.9)	
	ICD	84 (39.4)	64 (26.6)	
Any mental diagnosis experience in primary care practice		201 (94.4)	232 (96.3)	0.336[b]
The most easily diagnosed mental disorder	Anxiety spectrum disorders	130 (61.0)	126 (52.3)	0.116[b]
	OCD spectrum	15 (7.0)	14 (5.8)	
	Depression spectrum disorders	56 (26.3)	89 (36.9)	
	Bipolar spectrum disorders	12 (5.6)	12 (5.0)	
The most difficult diagnosed mental disorder	OCD spectrum	16 (7.5)	15 (6.2)	0.366[b]
	Depression spectrum disorders	6 (2.8)	4 (1.7)	
	Bipolar spectrum disorders	124 (58.2)	159 (66.0)	
	Schizophrenia spectrum disorders	67 (31.5)	63 (26.1)	
The most difficult disorder in the follow-up and treatment process	Depression spectrum disorders	13 (6.1)	8 (3.3)	<0.001*[b]
	Bipolar spectrum disorders	62 (29.1)	59 (24.5)	
	Schizophrenia spectrum disorders	52 (24.4)	23 (9.5)	
	Alcohol/drug use disorders	86 (40.4)	151 (62.7)	
Approach to the psychotic patient	I refer directly to a psychiatrist	198 (93.0)	232 (96.3)	0.116[b]
	I start treatment and then refer a psychiatrist	15 (7.0)	9 (3.7)	

*$p < 0.001$. Independent sample t-test[a] and Chi-square test[b] were used in statistical analysis.
PCP, Primary care provider; SD, Standard deviation; DSM, Diagnostic and Statistical Manual of Mental Disorders; ICD, International Classification of Diseases; OCD, Obsessive-compulsive disorder.

drugs, and 29 PCPs (6.38%) were prescribing psychotropic medications other than red and green prescription drugs. Fifty-six PCPs (12.34%) did not prescribe psychotropic medications in any case.

The most frequently preferred benzodiazepines by 45 (9.9%) of PCPs were alprazolam, 33 (7.3%) were medazepam, 12 (2.6%) were diazepam, seven (1.5%) were lorazepam, three (0.7%) were clonazepam. Eighty-nine PCPs (19.6%) had experience prescribing benzodiazepines in the anxiety spectrum disorder.

Psychotropic use characteristics and attitudes of PCPs by gender were shown in Table 2.

Comparison of training characteristics, experiences and attitudes of PCPs in terms of gender

Experience of depression spectrum disorder diagnosis ($p = 0.077$), anxiety spectrum disorder diagnosis experience ($p = 0.178$), experience of panic disorder diagnosis ($p = 0.584$), obsessive-compulsive spectrum disorder diagnosis experience ($p = 0.814$), experience of schizophrenia spectrum disorder diagnosis ($p = 0.165$), bipolar spectrum disorder diagnosis experience ($p = 0.154$), experience of alcohol/drug use disorder diagnosis ($p = 0.105$), sexual dysfunction diagnosis experience ($p = 0.607$), attention-deficit/hyperactivity disorder diagnosis experience ($p = 0.529$), antidepressant use experience ($p = 0.787$) and antipsychotic use experience ($p = 0.102$) were similar between genders. Postpartum depression diagnosis experience was higher in female PCPs ($p < 0.001$). Comparison of experiences and attitudes of PCPs according to gender was shown in Table 1.

Comparison of training characteristics, experiences and attitudes of PCPs in terms of family medicine specialty

The rate of panic disorder diagnosis experience ($p = 0.009$) among family medicine specialists is higher than that of general practitioners. The diagnosis experience of depression spectrum disorder ($p = 0.870$), schizophrenia spectrum disorder ($p = 0.106$), bipolar spectrum disorder ($p = 0.427$), attention-deficit/hyperactivity disorder ($p = 0.479$),

TABLE 2 Psychotropic use characteristics and attitudes of PCPs in terms of gender.

Variables		Male (n = 213) Mean ± SD and n(%)	Female (n = 241) Mean ± SD and n(%)	p value
Thoughts on minimum duration for which ADs should be used (month)		5.42 ± 3.79	4.82 ± 3.00	0.061[a]
Thoughts on AD effect onset time (week)		2.44 ± 1.01	2.40 ± 1.51	0.748[a]
AD use experience		172 (80.8)	197 (81.7)	0.787[b]
AP use experience		27 (12.7)	44 (18.3)	0.102[b]
Medication preference in insomnia	I do not start treatment myself for insomnia	12 (5.6)	40 (16.6)	<0.001*[b]
	Quetiapine	14 (6.6)	23 (9.5)	
	Antihistamines	109 (51.2)	92 (38.2)	
	Medazepam	15 (7.0)	9 (3.7)	
	Trazodone	17 (8.0)	14 (5.8)	
	Opipramol	32 (15.0)	29 (12.0)	
	Herbal supplement	14 (6.6)	34 (14.1)	
First AD preference in depression spectrum disorders	I do not start treatment myself	63 (29.6)	23 (9.5)	<0.001*[b]
	Sertraline	74 (34.7)	119 (49.4)	
	Escitalopram	66 (31.0)	92 (38.2)	
	Citalopram	10 (4.7)	7 (2.9)	
First AD preference in anxiety disorder spectrum	I do not start treatment myself	78 (36.6)	63 (26.1)	<0.001*[b]
	Sertraline	21 (9.9)	55 (22.8)	
	Escitalopram	52 (24.4)	73 (30.3)	
	Citalopram	16 (7.5)	6 (2.5)	
	Paroxetine	28 (13.1)	17 (7.1)	
	Fluoxetine	18 (8.5)	27 (11.2)	
First AD preference in OCD spectrum	I do not start treatment myself	130 (61.0)	145 (60.2)	0.124[b]
	Sertraline	16 (7.5)	24 (10.0)	
	Escitalopram	10 (4.7)	17 (7.1)	
	Citalopram	11 (5.2)	5 (2.1)	
	Paroxetine	14 (6.6)	23 (9.5)	
	Fluoxetine	4 (1.9)	8 (3.3)	
	Clomipramine	6 (2.8)	7 (2.9)	
	Duloxetine	22 (10.3)	12 (5.0)	
Did you know that ADs must be used regularly every day for full effectiveness?		185 (86.9)	216 (89.6)	0.359[b]
Do ADs cause forgetfulness?		112 (52.6)	156 (64.7)	0.009*[b]
Do ADs cause numb?		104 (48.8)	113 (49.9)	0.680[b]
Do ADs lead to suicide?		12 (5.6)	13 (5.4)	0.911[b]
Are ADs addictive?		50 (23.5)	31 (12.9)	0.003*[b]
Implementing reported/prescribed LAI AP in family health center		177 (83.1)	167 (69.3)	0.001*[b]

*p < 0.001; Independent sample t-test[a] and Chi-square test[b] were used in statistical analysis; PCP, Primary care provider; SD, Standard deviation; AD, Antidepressant; AP, Antipsychotic; OCD, Obsessive-compulsive disorder; LAI, Long-acting injectable.

postpartum depression (p = 0.137), and anxiety spectrum disorder (p = 0.839) were similar between family medicine specialists and general practitioners.

The experience of using antidepressants (p = 0.615), mood stabilizers (p = 0.107), and the most frequently preferred benzodiazepine (p = 0.838) was similar between family medicine specialists and general practitioners. Experience in using antipsychotics (p < 0.001), benzodiazepines (p < 0.001), psychostimulants (p = 0.010), and modafinil (p = 0.001) was higher in general practitioners than in family medicine specialists.

The comparison of PCPs according to their specialization status in terms of various variables was shown in Tables 3, 4.

Comparison of training characteristics, experiences and attitudes of PCPs in terms of in-service training in psychiatry

The rate of receiving in-service training in psychiatry (p < 0.001) was significantly higher in family medicine specialists than in general

TABLE 3 Sociodemographic, training characteristics and experiences, attitudes of PCPs in terms of specialization status.

Variables		General practitioner (n = 321) Mean ± SD and n(%)	Family medicine specialist (n = 133) Mean ± SD and n(%)	p value
Age (years)		37.94 ± 7.18	35.56 ± 7.55	0.002*[a]
Duration of primary care practice (years)		8.06 ± 6.05	5.61 ± 3.74	<0.001**[a]
Psychiatry in-service training		129 (40.2)	105 (78.9)	<0.001**[b]
Number of daily patient examinations	0–20 examination	99 (30.8)	49 (36.8)	0.175[b]
	21–50 examination	118 (36.8)	37 (27.8)	
	>51 examination	104 (32.4)	47 (35.3)	
Use of classification criteria	No	100 (31.2)	0 (0.0)	<0.001**[b]
	DSM	81 (25.2)	125 (94.0)	
	ICD	140 (43.6)	8 (6.0)	
Any mental diagnosis experience in primary care practice		300 (93.5)	133 (100.0)	0.003*[b]
The most easily diagnosed mental disorder	Anxiety spectrum disorders	209 (65.1)	47 (35.3)	<0.001**[b]
	OCD spectrum	26 (8.1)	3 (2.3)	
	Depression spectrum disorders	69 (21.5)	76 (57.1)	
	Bipolar spectrum disorders	17 (5.3)	7 (5.3)	
The most difficult diagnosed mental disorder	OCD spectrum	24 (7.5)	7 (5.3)	0.395[b]
	Depression spectrum disorders	5 (1.6)	5 (3.8)	
	Bipolar spectrum disorders	198 (61.7)	85 (63.9)	
	Schizophrenia spectrum disorders	94 (29.3)	36 (27.1)	
The most difficult disorder in the follow-up and treatment process	Depression spectrum disorders	17 (5.3)	4 (3.0)	<0.001**[b]
	Bipolar spectrum disorders	88 (27.4)	33 (24.8)	
	Schizophrenia spectrum disorders	69 (21.5)	6 (4.5)	
	Alcohol/drug use disorders	147 (45.8)	90 (67.7)	
Approach to the psychotic patient	I refer directly to a psychiatrist	297 (92.5)	133 (100.0)	0.001*[b]
	I start treatment and then refer a psychiatrist	24 (7.5)	0 (0.0)	

*$p < 0.05$, **$p < 0.001$. Independent sample t-test[a] and Chi-square test[b] were used in statistical analysis.
PCP, Primary care provider; SD, Standard deviation; DSM, Diagnostic and Statistical Manual of Mental Disorders; ICD, International Classification of Diseases; OCD, Obsessive-compulsive disorder.

practitioners. The rate of using DSM as a basis when evaluating mental disorders ($p < 0.001$) was higher in PCPs who received in-service training in psychiatry. Anxiety spectrum disorder ($p < 0.001$), panic disorder ($p = 0.018$), obsessive-compulsive spectrum disorder ($p < 0.001$), bipolar spectrum disorder ($p < 0.001$), sexual function disorder ($p < 0.001$), attention-deficit/hyperactivity disorder ($p < 0.001$) and postpartum depression ($p < 0.001$) diagnosis experience was significantly higher in PCPs who received in-service training in psychiatry.

Experience in using antidepressants ($p < 0.001$), antipsychotics ($p < 0.001$), mood stabilizers ($p < 0.001$) and benzodiazepines ($p = 0.001$) was significantly higher in PCPs who received in-service training in psychiatry.

PCPs, who had not received in-service training in psychiatry, referred all patients presenting with psychotic symptoms to psychiatry. The experience of encountering suicide-related situations was significantly higher in PCPs who received in-service training in psychiatry ($p < 0.001$). The rate of starting treatment in insomnia ($p < 0.001$), depression spectrum disorder ($p < 0.001$), anxiety spectrum disorder ($p < 0.001$), and obsessive-compulsive spectrum disorder ($p < 0.001$) was higher in PCPs who received in-service training in psychiatry ($p < 0.001$). The false belief that antidepressants cause suicide and addiction was higher in PCPs who did not receive in-service training in psychiatry.

Application of binary logistic regression analysis to various variables

Binary logistic regression analysis was used to predict specialization status and was applied separately for each significant independent variable. According to the binary logistic regression analysis, the p values of psychiatry in-service training, the most easily diagnosed mental disorder, the most difficult mental disorder in the follow-up and treatment process, medication preference in insomnia, and regular daily use of antidepressants were determined to be less than 0.05. According to the binary logistic regression analysis, the sensitivity of our model was 93.1, and the specificity was 98.5%

TABLE 4 Psychotropic use characteristics and attitudes of PCPs in terms of specialization status.

Variables		General practitioner (n = 321) Mean ± SD and n(%)	Family medicine specialist (n = 133) Mean ± SD and n(%)	p value
Thoughts on minimum duration for which ADs should be used (month)		5.28 ± 3.55	4.66 ± 2.98	0.077[a]
Thoughts on AD effect onset time (week)		2.27 ± 1.17	2.79 ± 1.50	<0.001**[a]
AD use experience		259 (80.7)	110 (82.7)	0.615[b]
AP use experience		63 (19.6)	8 (6.0)	<0.001**[b]
Mood stabilizer use experience		41 (12.8)	10 (7.5)	0.107[b]
BZD use experience		98 (30.5)	18 (13.5)	<0.001**[b]
Psychostimulant use experience		29 (9.0)	3 (2.3)	0.010*[b]
Modafinil use experience		51 (15.9)	6 (4.5)	0.001*[b]
Medication preference in insomnia	I do not start treatment myself for insomnia	52 (16.2)	0 (0.0)	<0.001**[b]
	Quetiapine	14 (4.4)	23 (17.3)	
	Antihistamines	113 (35.2)	88 (66.2)	
	Medazepam	16 (5.0)	8 (6.0)	
	Trazodone	31 (9.7)	0 (0.0)	
	Opipramol	56 (17.4)	5 (3.8)	
	Herbal supplement	39 (12.1)	9 (6.8)	
First AD preference in depression spectrum disorders	I do not start treatment myself	86 (26.8)	0 (0.0)	<0.001**[b]
	Sertraline	105 (32.7)	88 (66.2)	
	Escitalopram	115 (35.8)	43 (32.3)	
	Citalopram	15 (4.7)	2 (1.5)	
First AD preference in anxiety spectrum disorders	I do not start treatment myself	108 (33.6)	33 (24.8)	<0.001**[b]
	Sertraline	46 (14.3)	30 (22.6)	
	Escitalopram	74 (23.1)	51 (38.3)	
	Citalopram	19 (5.9)	3 (2.3)	
	Paroxetine	42 (13.1)	3 (2.3)	
	Fluoxetine	32 (10.0)	13 (9.8)	
First AD preference in OCD spectrum	I do not start treatment myself	184 (57.3)	91 (68.4)	<0.001**[b]
	Sertraline	16 (5.0)	24 (18.0)	
	Escitalopram	15 (4.7)	12 (9.0)	
	Citalopram	13 (4.0)	3 (2.3)	
	Paroxetine	37 (11.5)	0 (0.0)	
	Fluoxetine	11 (3.4)	1 (0.8)	
	Clomipramine	13 (4.0)	0 (0.0)	
	Duloxetine	32 (10.0)	2 (1.5)	
The most frequently experienced psychotropic side effect	I did not encounter	48 (15.0)	0 (0.0)	<0.001**[b]
	Sedation	171 (53.3)	97 (72.9)	
	Dystonia	24 (7.5)	0 (0.0)	
	Constipation	19 (5.9)	0 (0.0)	
	Mouth dry	12 (3.7)	13 (9.8)	
	Palpitation	47 (14.6)	0 (0.0)	
	Headache/dizziness	0 (0.0)	23 (17.3)	
Did you know that ADs must be used regularly every day for full effectiveness?		268 (83.5)	133 (100.0)	<0.001**[b]

(Continued)

TABLE 4 (Continued)

Variables	General practitioner (n = 321) Mean ± SD and n(%)	Family medicine specialist (n = 133) Mean ± SD and n(%)	p value
Do ADs cause forgetfulness?	195 (60.7)	73 (54.9)	0.248[b]
Do ADs cause numb?	171 (53.3)	46 (34.6)	<0.001**[b]
Do ADs lead to suicide?	25 (7.8)	0 (0.0)	0.001*[b]
Are ADs addictive?	58 (18.1)	23 (17.3)	0.844[b]
Implementing reported/prescribed LAI AP in family health center	291 (90.7)	53 (39.8)	<0.001**[b]

*$p < 0.05$, **$p < 0.001$. Independent sample t-test[a] and Chi-square test[b] were used in statistical analysis.
PCP, Primary care provider; SD, Standard deviation; AD, Antidepressant; AP, Antipsychotic; BZD, Benzodiazepine; OCD, Obsessive-compulsive disorder; LAI, Long-acting injectable.

(Beginning block −2 Log likelihood 549.399, overall p value < 0.001; Block one −2 Log likelihood 99.417[a], Cox & Snell $R^2 = 0.629$, Nagelkerke $R^2 = 0.896$; Hosmer and Lemeshow Test p value > 0.999).

Binary logistic regression analysis was used to predict psychiatry in-service training experience and was applied separately for each significant independent variable. While creating the model, the variables with the highest significance level under the same topic (e.g., only one of the variables such as antidepressant use experience, antipsychotic use experience, benzodiazepine use experience) were included. Also, it was aimed to reach the highest significance level with fewer variables. According to the binary logistic regression analysis, the p values of using classification criteria, experience of anxiety spectrum disorder diagnosis, antidepressant use experience, approach to psychotic disorder, suicide detection experience, first antidepressant choice in anxiety, and addictive status of antidepressants were determined to be less than 0.05. Anxiety disorder diagnosis experience, antidepressant use experience, and approach to psychotic disorder variables were excluded because they did not contribute sufficiently to the model. According to the binary logistic regression analysis, the sensitivity of our model (using classification criteria, suicide detection experience, first antidepressant choice in anxiety, addictive status of antidepressants) was 88.6, and the specificity was 98.3% (Beginning block −2 Log likelihood 628.946, overall p value < 0.001; Block one −2 Log likelihood 141.054[a], Cox & Snell $R^2 = 0.659$, Nagelkerke $R^2 = 0.878$; Hosmer and Lemeshow Test p value 0.938).

Discussion

This study examined the experiences, practices, and attitudes of PCPs in Turkey regarding mental disorder management. PCPs differed significantly in their approach to mental disorders and in their psychotropic selection. Gender was found to be associated with various variables: the majority of family medicine specialists are females. This disparity influenced various comparison findings between genders. The findings need to be interpreted in light of this information.

When the findings of our study are examined, it can be seen that almost all the PCPs had experience in considering a diagnosis of a mental disorder in at least one patient. The majority of common mental disorders visit PCPs. Anxiety and depression spectrum disorders were the most frequently encountered and most easily diagnosed mental disorders in primary care practice. This finding appears to be compatible with the literature (23). Schizophrenia and bipolar spectrum disorders have also been identified as mental disorders for which PCPs experience difficulties in the diagnosis and treatment process. The general approach is that PCPs recognize psychotic and affective symptoms and refer these individuals to psychiatry. It is thought that bipolar and schizophrenia spectrum disorders, which have been diagnosed and are in remission, can be followed-up by PCPs (24, 25). According to this study, suicide-related situations were experienced by one third of PCPs. However, the real number is thought to be higher than this. Unfortunately, inadequate training also manifests itself in the process of handling suicide. Inquiring about suicide-related situations, which is an essential part of mental history-taking, is often skipped or not handled appropriately. This situation may cause many cases to be overlooked (26). To solve these problems, mental status examination should be discussed in detail in in-service training in psychiatry, and the importance of inquiring vegetative symptoms such as sleep and appetite and suicide-related situations should be emphasized (20).

Specialization status appears to be reflected in the results. Family medicine specialists had more psychiatry in-service training experience. This is likely to be related to local Ministry of Health policies. In-service training related to psychiatry may be aimed primarily at training family medicine specialists. In the survey, the opinions of general practitioners and family medicine specialists differed regarding mental disorders that are most easily diagnosed and most difficult to follow-up and treat. Family medicine specialists reported that the mental disorder they had the most difficulty in monitoring and treating was alcohol/drug use disorders. It is thought that the possible reason for this may be related to the content of psychiatry in-service training. In recent years, serious studies have been carried out in Turkey regarding the follow-up and treatment of alcohol/drug use disorders (27). These studies may be carried out by family medicine specialists through psychiatry in-service training. Both general practitioners and family medicine specialists reported that the type of mental disorder they found most difficult to diagnose was bipolar spectrum disorders. Bipolar spectrum disorders is often confused with conditions such as major depressive disorder, borderline personality disorder, schizophrenia, attention-deficit/hyperactivity disorder, or adolescence, and differential diagnosis requires serious effort and knowledge (28–30). The early identification of bipolar spectrum disorders is problematic. Patients with bipolar spectrum disorder symptoms may be misdiagnosed and improperly treated, resulting in significant treatment failure. In the primary care setting, patients who have bipolar spectrum disorder may represent a significant proportion of the difficult-to-treat depressed and anxious patients (28). PCPs can be trained on the differential diagnosis of bipolar spectrum disorder or indications for referral to

psychiatry through psychiatry in-service training. Otherwise, a bipolar spectrum disorder diagnosis may be missed for several years or longer (28, 31).

Several epidemiological studies have clearly shown that primary and secondary sleep disturbances are very common in the general population. Common complaints include difficulty falling and staying asleep, frequent awakenings, and excessive daytime sleepiness (32). Insomnia is among the most common sleep disorder symptoms (33). Although insomnia is treatable, it often remain underdiagnosed. If insomnia is left untreated, its negative impact on daytime functioning may be challenging (32, 33). It is important for physicians to be aware of it, as it causes considerable physical and psychological stress. In this study, the medication preferences of PCPs regarding insomnia were elicited and our findings show that PCPs hesitate to initiate treatment for insomnia. Half of PCPs refer patients with insomnia to various medical specialties including psychiatry, neurology, and pulmonology. PCPs who initiate treatment often prefer antihistamines. PCPs tend to use medications with less sleep-inducing effects in the treatment of insomnia. This can be interpreted as PCPs not wanting to encounter possible psychotropic side effects. However, it is possible that uncontrolled use of antihistamines for a prolonged period may cause various problems (34). This is where in-service training in psychiatry plays an important role. In these trainings, PCPs, whose knowledge level is increased about sleep disorders, the distinction between primary and secondary sleep disorders, ensuring sleep hygiene, medications that can be used and possible side effects, can complete the treatment of these patients in primary care and prevent the patients from occupying secondary and tertiary healthcare institutions.

It seems that knowledge of PCPs about psychotropic medications is not sufficient. As with patients and their relatives, the number of PCPs who thought that antidepressants were addictive and caused suicide, numbness and forgetfulness was not small (35, 36). One eighth of PCPs did not prescribe psychotropic medications under any circumstances. Experience with psychotropic use and knowledge about the general characteristics of antidepressants vary significantly among PCPs. Experience in prescribing antipsychotics, psychostimulants, and modafinil was higher among general practitioners. Although the rate of in-service training in psychiatry was lower, general practitioners have a greater variety of psychotropic drug use. Under normal circumstances, those who receive in-service training would be expected to report a higher variety of psychotropic use. This situation was interpreted as the need to reorganize the content of in-service training in psychiatry. Another important finding of this study is that those who have not received in-service training in psychiatry do not take into account classification systems, when evaluating mental disorders and are far from employing a systematic approach. It is recommended to include clinical pharmacists in the in-service training in psychiatry trainer group when creating psychiatry training curricula (37, 38). PCPs should be informed about drug interactions with the contribution of clinical pharmacists, and approaches for special groups such as elderly patients should be highlighted. Aging is associated with progressive decrease in the function of multiple organs, presence of comorbidities, polypharmacy, and social and functional problems that may lead to inappropriate use of medications (39). Psychotropics are widely used in the elderly population and often their use is inappropriate. Inappropriate use of psychotropic medications has been associated with a high incidence of side effects especially in the older population such as cognitive and psychomotor impairment, falls and fractures (40). In order to reduce inappropriate use of psychotropic medications in elderly, it is important to stay away from polypharmacy, manage with the optimum effective dose, closely monitor the functions of organs such as the liver and kidney, and keep the time between visits short. Psychiatry training of PCPs addressing the use of psychotropic medications in elderly patients should have these features (39).

Patients who were thought to have psychotic symptoms were referred to a psychiatrist by PCPs who received in-service training in psychiatry. Experience of encountering suicide-related situations was also higher among PCPs who received in-service training in psychiatry. A PCP who has no or insufficient knowledge about a subject cannot be expected to question on it. In this sense, it is meaningful that PCPs who receive in-service training in psychiatry have higher experience with patients with suicide ideation and psychotic symptoms. The rate of starting treatment for various mental conditions was also higher among PCPs who received in-service training in psychiatry. Misinformation about antidepressants was also more common among PCPs who did not receive in-service training in psychiatry.

It is thought that many mental disorders, especially anxiety and depression spectrum disorders, can be diagnosed and treated effectively by PCPs. The World Health Organization and American Psychiatric Association developed specific diagnostic guidelines for the mental disorders in primary care (41). A significant portion of symptoms of mental disorders can be treated with a medical education that understands the importance of the subject and in-service training in psychiatry repeated at regular intervals. As in many parts of the world, there are studies examining psychiatry education in medicine and its sub-branches in Turkey (42). A study was conducted by Çıngı-Başterzi et al. (42) in 2007 in the psychiatry departments of 29 of 59 medical schools in Turkey. In this study (42), it was shown that the Core Education Program created by Turkish Medicine and Health Education Council was implemented in only 37.5% of medical schools, that preclinical and clinical training contents varied between medical schools, and that three of the medical schools did not offer internships in psychiatry. The majority of chairs of psychiatry departments emphasized the importance of mood disorders (49.9%) and anxiety disorders (40%), suggesting that these disorders should be treated by general practitioners (42). Çıngı-Başterzi et al. (42) suggested that a standardized curriculum should be developed in line with international guidelines for psychiatric education. There is no more up-to-date source examining the psychiatry training of medical students and PCPs in Turkey. Newer studies are needed to determine the possible situation and gaps. It is thought that the present study will contribute to filling this gap in Turkey.

Although this study examined the approach of PCPs in Turkey to mental disorders, there are problems arising from lack or inadequacy of training in many countries (43, 44). Based on the findings of this study, the approaches and experiences of PCPs in various countries regarding mental disorders can be compared. Health care professionals need to work in collaboration in order to maintain standardized and internationally valid training based on these and similar studies. While the organization of a country's healthcare system will differ

according to the geography, healthcare priorities, availability of resources, and funding, many authorities have recognized the importance of collaboration between primary care services and specialized mental health to enable primary care to deliver effective mental health care. Indeed, the World Health Organization has recommended that integrating mental health services within primary care may be the optimal way of responding to the increasing demand for mental health care (45).

Strengths, limitations, and future directions

The most conspicuous aspect of this study is that it examines the approaches and experiences of family medicine specialists and general practitioners regarding mental disorders, taking into account the psychiatry in-service training factor. In this study, approaches to diagnosis and treatment of mental disorders were examined together and in detail. The cross-sectional nature of the study can be considered a limitation. In addition, antidepressant subclasses were not questioned under separate headings, and all antidepressant medications were included under the general term 'antidepressant'. Furthermore, PCP experiences with mental disorders were self-reported, and it was not possible to determine whether the information reported by PCPs was correct. The position of sociodemographic characteristics, clinical experiences, perspectives on such survey studies, and willingness to participate in surveys of the participants who filled out the surveys distributed to WhatsApp and Yahoo groups are not known within the PCP universe in Turkey, that similar limitations may also be encountered in face-to-face survey studies. Finally, their experience in diagnosing mental disorders was not verified by another healthcare professional. In this sense, prospective studies are needed.

Conclusion

This study reports that approaches, experiences and knowledge levels of PCPs regarding the diagnosis and treatment of mental disorders show significant differences. It seems that one of the most important reasons for these differences is education. The handling of mental cases in medical education and the existence and content of in-service training in psychiatry after medical school graduation affect the mental knowledge and approaches of PCPs. First, the importance given to the diagnosis and treatment of mental disorders in medical education needs to be emphasized, and theoretical knowledge needs to be supported practically. Afterwards, all PCPs are required to update their knowledge at regular intervals through in-service training in psychiatry.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Fırat University Non-invasive Research Ethics Committee: Date: 14/09/2023; Number: 2023/12-12. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

DÖ: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Funding

The author declares that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Otten D, Tibubos AN, Schomerus G, Brähler E, Binder H, Kruse J, et al. Similarities and differences of mental health in women and men: a systematic review of findings in three large German cohorts. *Front Public Health*. (2021) 9:553071. doi: 10.3389/fpubh.2021.553071

2. Keyes CL, Dhingra SS, Simoes EJ. Change in level of positive mental health as a predictor of future risk of mental illness. *Am J Public Health*. (2010) 100:2366–71. doi: 10.2105/AJPH.2010.192245

3. World Health Organization. World mental health report: Transforming mental health for all (2022). Available at: https://iris.who.int/bitstream/handle/10665/356119/9789240049338-eng.pdf?sequence=1 (Accessed July 23, 2024).

4. Trautmann S, Rehm J, Wittchen HU. The economic costs of mental disorders: do our societies react appropriately to the burden of mental disorders? *EMBO Rep*. (2016) 17:1245–9. doi: 10.15252/embr.201642951

5. Sanghera S, Coast J. Measuring quality-adjusted life-years when health fluctuates. *Value Health*. (2020) 23:343–50. doi: 10.1016/j.jval.2019.09.2753. Erratum in: *Value Health*. (2020) 23(12):1672. doi:10.1016/j.jval.2020.10.009

6. Ohrnberger J, Fichera E, Sutton M. The relationship between physical and mental health: a mediation analysis. *Soc Sci Med*. (2017) 195:42–9. doi: 10.1016/j.socscimed.2017.11.008

7. Zeller SL, Citrome L. Managing agitation associated with schizophrenia and bipolar disorder in the emergency setting. *West J Emerg Med*. (2016) 17:165–72. doi: 10.5811/westjem.2015.12.28763

8. Rucci P, Gherardi S, Tansella M, Piccinelli M, Berardi D, Bisoffi G, et al. Subthreshold psychiatric disorders in primary care: prevalence and associated characteristics. *J Affect Disord*. (2003) 76:171–81. doi: 10.1016/s0165-0327(02)00087-3

9. Kessler LG, Cleary PD, Burke JD Jr. Psychiatric disorders in primary care. Results of a follow-up study. *Arch Gen Psychiatry*. (1985) 42:583–7. doi: 10.1001/archpsyc.1985.01790290065007

10. Isaacs AN, Mitchell EKL. Mental health integrated care models in primary care and factors that contribute to their effective implementation: a scoping review. *Int J Ment Health Syst*. (2024) 18:5. doi: 10.1186/s13033-024-00625-x

11. Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA*. (2003) 289:3095–105. doi: 10.1001/jama.289.23.3095

12. Evans-Lacko S, Aguilar-Gaxiola S, Al-Hamzawi A, Alonso J, Benjet C, Bruffaerts R, et al. Socio-economic variations in the mental health treatment gap for people with anxiety, mood, and substance use disorders: results from the WHO world mental health (WMH) surveys. *Psychol Med*. (2018) 48:1560–71. doi: 10.1017/S0033291717003336

13. Stuhec M, Hahn M, Taskova I, Bayraktar I, Fitzgerald I, Molitschnig L, et al. Clinical pharmacy services in mental health in Europe: a commentary paper of the European Society of Clinical Pharmacy Special Interest Group on mental health. *Int J Clin Pharm*. (2023) 45:1286–92. doi: 10.1007/s11096-023-01643-4

14. Smolders M, Laurant M, Verhaak P, Prins M, van Marwijk H, Penninx B, et al. Adherence to evidence-based guidelines for depression and anxiety disorders is associated with recording of the diagnosis. *Gen Hosp Psychiatry*. (2009) 31:460–9. doi: 10.1016/j.genhosppsych.2009.05.011

15. Huo S, Bruckner TA, Xiong GL, Cooper E, Wade A, Neikrug AB, et al. Antidepressant prescription behaviour among primary care clinician providers after an interprofessional primary care psychiatric training program. *Admin Pol Ment Health*. (2023) 50:926–35. doi: 10.1007/s10488-023-01290-x

16. Radovic A, Farris C, Reynolds K, Reis EC, Miller E, Stein BD. Primary care providers' initial treatment decisions and antidepressant prescribing for adolescent depression. *J Dev Behav Pediatr*. (2014) 35:28–37. doi: 10.1097/DBP.0000000000000008

17. Olesen M. Cooperative collaboration in the hybrid space of google docs based group work. *Educ Sci*. (2020) 10:269. doi: 10.3390/educsci10100269

18. Yayla EN, Çizmeci B. A research on the recognition of mobile health applications of the ministry of health. *Süleyman Demirel Univ Vis J*. (2022) 13:254–70. doi: 10.21076/vizyoner.897754

19. Kallio H, Voutilainen A, Viinamäki L, Kangasniemi M. In-service training to enhance the competence of health and social care professionals: a document analysis of web-based training reports. *Nurse Educ Today*. (2020) 92:104493. doi: 10.1016/j.nedt.2020.104493

20. Maconick L, Jenkins LS, Fisher H, Petrie A, Boon L, Reuter H. Mental health in primary care: integration through in-service training in a south African rural clinic. *Afr J Prim Health Care Fam Med*. (2018) 10:e1–7. doi: 10.4102/phcfm.v10i1.1660

21. Republic of Turkey Ministry of Health. 2024–2028 strategic plan (2024). Available at: https://dosyamerkez.saglik.gov.tr/Eklenti/47452/0/saglik-bakanligi-stratejik-plan-2024-2028pdf.pdf?_tag1=7B2A9834832BF7DCF36F2C7E5607D8543752A372 (Accessed July 23, 2024).

22. Sample Size Calculator. (2024). Available at: https://www.calculator.net/sample-size-calculator.html (Accessed July 23, 2024).

23. Ansseau M, Dierick M, Buntinkx F, Cnockaert P, De Smedt J, Van Den Haute M, et al. High prevalence of mental disorders in primary care. *J Affect Disord*. (2004) 78:49–55. doi: 10.1016/s0165-0327(02)00219-7

24. Jones R, Major B, Fear C. Schizophrenia in a primary care setting. *Curr Psychiatry Rep*. (2015) 17:84. doi: 10.1007/s11920-015-0620-y

25. Shakespeare J, Dixon S, Marwaha S. Primary care and bipolar disorder. *Br J Gen Pract*. (2023) 73:104–5. doi: 10.3399/bjgp23X732057

26. Dueweke AR, Bridges AJ. Suicide interventions in primary care: a selective review of the evidence. *Fam Syst Health*. (2018) 36:289–302. doi: 10.1037/fsh0000349

27. Akgür SA, Erdem A, Coşkunol H. Legal workplace policies for drugs and alcohol in Turkey. *Drug Test Anal*. (2012) 4:74–5. doi: 10.1002/dta.423

28. Muzina DJ. Bipolar spectrum disorder: differential diagnosis and treatment. *Prim Care*. (2007) 34:521–50. doi: 10.1016/j.pop.2007.06.001

29. Carlson GA. Differential diagnosis of bipolar disorder in children and adolescents. *World Psychiatry*. (2012) 11:146–52. doi: 10.1002/j.2051-5545.2012.tb00115.x

30. Bayes A, Parker G, Paris J. Differential diagnosis of bipolar II disorder and borderline personality disorder. *Curr Psychiatry Rep*. (2019) 21:125. doi: 10.1007/s11920-019-1120-2

31. Manning JS, Haykal RF, Connor PD, Akiskal HS. On the nature of depressive and anxious states in a family practice setting: the high prevalence of bipolar II and related disorders in a cohort followed longitudinally. *Compr Psychiatry*. (1997) 38:102–8. doi: 10.1016/s0010-440x(97)90089-4

32. Ram S, Seirawan H, Kumar SK, Clark GT. Prevalence and impact of sleep disorders and sleep habits in the United States. *Sleep Breath*. (2010) 14:63–70. doi: 10.1007/s11325-009-0281-3

33. Roth T. Insomnia: definition, prevalence, etiology, and consequences. *J Clin Sleep Med*. (2007) 3:7–10. doi: 10.5664/jcsm.26929

34. Li L, Liu R, Peng C, Chen X, Li J. Pharmacogenomics for the efficacy and side effects of antihistamines. *Exp Dermatol*. (2022) 31:993–1004. doi: 10.1111/exd.14602

35. Lu Y, Arthur D, Hu L, Cheng G, An F, Li Z. Beliefs about antidepressant medication and associated adherence among older Chinese patients with major depression: a cross-sectional survey. *Int J Ment Health Nurs*. (2016) 25:71–9. doi: 10.1111/inm.12181

36. Abdallat M, Murshidi R, Taha H, Jaber DZ, Hammouri M, Al-Huneidy L, et al. An investigation of knowledge and attitudes towards antidepressants: a cross-sectional survey of Jordan's six medical schools. *BMC Psychiatry*. (2023) 23:604. doi: 10.1186/s12888-023-05037-8

37. Stuhec M, Zorjan K. Clinical pharmacist interventions in ambulatory psychogeriatric patients with excessive polypharmacy. *Sci Rep*. (2022) 12:11387. doi: 10.1038/s41598-022-15657-x

38. Buist E, McLelland R, Rushworth GF, Stewart D, Gibson-Smith K, MacLure A, et al. An evaluation of mental health clinical pharmacist independent prescribers within general practice in remote and rural Scotland. *Int J Clin Pharm*. (2019) 41:1138–42. doi: 10.1007/s11096-019-00897-1

39. Ćurković M, Dodig-Ćurković K, Erić AP, Kralik K, Pivac N. Psychotropic medications in older adults: a review. *Psychiatr Danub*. (2016) 28:13–24.

40. Vidal X, Agustí A, Vallano A, Formiga F, Moyano AF, García J, et al. Elderly patients treated with psychotropic medicines admitted to hospital: associated characteristics and inappropriate use. *Eur J Clin Pharmacol*. (2016) 72:755–64. doi: 10.1007/s00228-016-2032-2

41. Bandelow B, Sher L, Bunevicius R, Hollander E, Kasper S, Zohar J, et al. Guidelines for the pharmacological treatment of anxiety disorders, obsessive-compulsive disorder and posttraumatic stress disorder in primary care. *Int J Psychiatry Clin Pract*. (2012) 16:77–84. doi: 10.3109/13651501.2012.667114. Erratum in: *Int J Psychiatry Clin Pract*. (2012) 16(3):242. Erratum in: *Int J Psychiatry Clin Pract*. (2013) 17(1):76

42. Cıngı Başterzi AD, Tükel R, Uluşahin A, Coşkun B, Alkın T, Murat Demet M, et al. Undergraduate psychiatric training in Turkey. *Turk Psikiyatri Derg*. (2010) 21:195–202.

43. Subelj M, Vidmar G, Svab V. Prescription of benzodiazepines in Slovenian family medicine: a qualitative study. *Wien Klin Wochenschr*. (2010) 122:474–8. doi: 10.1007/s00508-010-1413-2

44. Fraser K, Oyama O. Knowledge of psychotropics and prescribing preferences of family physicians: a preliminary study. *Acad Psychiatry*. (2013) 37:325–8. doi: 10.1176/appi.ap.12090160

45. Kates N, Arroll B, Currie E, Hanlon C, Gask L, Klasen H, et al. Improving collaboration between primary care and mental health services. *World J Biol Psychiatry*. (2019) 20:748–65. doi: 10.1080/15622975.2018.1471218

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 24 September 2024
DOI 10.3389/fpubh.2024.1446494

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Angelica M. Roncancio,
University of Houston–Downtown, United States
Sahar Boozari,
Tarbiat Modares University, Iran

*CORRESPONDENCE
Abdelgadir H. Osman
abdelgadir1159@yahoo.com

RECEIVED 09 June 2024
ACCEPTED 09 September 2024
PUBLISHED 24 September 2024

CITATION
Osman AH, Osman A, Osman IA and Hagar T (2024) Tapestry of postnatal emotional disorders: exploring the interplay of anxiety and depressive disorders and their associated risk factors in Sudanese women. *Front. Public Health* 12:1446494. doi: 10.3389/fpubh.2024.1446494

Tapestry of postnatal emotional disorders: exploring the interplay of anxiety and depressive disorders and their associated risk factors in Sudanese women

Abdelgadir H. Osman [1]*, Abdelaziz Osman[2], Ibtihal A. Osman[3] and Taisir Hagar[2]

[1]Department of Psychiatry, Faculty of Medicine, University of Khartoum, Khartoum, Sudan, [2]Al Amal Psychiatric Hospital, Dubai, United Arab Emirates, [3]Faculty of Medicine, Gezira University, Wad Madani, Sudan

Background: This research aims to unravel the prevalence of postnatal emotional disorders with a focus on how postnatal anxiety remained underestimated and often embroiled in postnatal depression.

Methods: Out of 600 postnatal women invited to take part in this study from two prominent primary care clinics in Khartoum, 468 women agreed to participate in this study. Three questionnaires were utilized in this study, a Personal Information Questionnaire (PIQ), Hospital Anxiety and Depression Scale (HADS), and Beck depression Inventory (BDI). Multiple linear regression analysis applied to gauge risk factors with postnatal anxiety and depression.

Results: More than half (52.50%) of women showed evidence of both anxiety and depression using HADS, while only (20.9%) of cases were detected by BDI, showing evidence of moderate depressive disorder. A substantial proportion (28.4%) showed high levels of comorbidity of anxiety and depression in the category of moderate to severe symptoms. Main risks factors for postnatal disorders were past psychiatric illness ($\beta = 0.25$, $p = 0.001$), a family history of psychiatric illness ($\beta = 0.15$, $p = 0.002$), and stress due to the number of children ($\beta = 0.32$, $p = 0.001$).

Conclusion: This study advances our understanding of postnatal emotional disorders, particularly highlighting the prevalence as well as correlates of postpartum anxiety. More importantly, this study highlights the importance of routine screen for emotional distress in postnatal women.

KEYWORDS

postnatal depression, postnatal anxiety, postnatal emotional disorders, Sudan metal health, women mental health, post-partum anxiety and depressive disorder, mixed anxiety and depressive disorder

1 Introduction

In the realm of maternal mental health, the postnatal period stands as a unique and critical juncture marked by multifaceted challenges and emotional complexities (1–3). According to existing literature, ~10%–20% of women are expected to experience distressing emotional disorders in the postnatal period (4). The severity of such disorders could be gauged from the fact that in the United Kingdom, 9% of postnatal maternal mortality is attributed to mental health disorders (5).

The existing literature predominantly centers on the occurrence, predictors, and repercussions of perinatal mood states, with a primary focus on postpartum depression (6–8). As the body of research is evolving, there has been a growing recognition of the importance of exploring additional prevalent mood states, such as anxiety and comorbid anxiety and depression (9, 10). A recent meta-analysis sponsored by the Royal College of Psychiatry found an average prevalence of 15.1% of postnatal anxiety symptoms and 9.1% of generalized anxiety disorders (11). The significance of conducting further research on maternal anxiety during the postnatal period was underscored by (12), who identified a predictive relationship between elevated anxiety levels and low birth weight (12). Moreover, many researchers demonstrated time and again that postnatal anxiety is tagged with an increased risk of suicide, as well as reduced mother-infant interactions, bonding problems, abnormal infant temperament, mother's mental, and child health and future development (13). It has been confirmed by experimental psychological research how anxiety disorder in postnatal mothers affects mother-child relationships leading to less communication, disrupting care and with a negative impact on the emotional development of children (14). This effect was believed to be mediated by negative worrying cognition (14). On the other hand, it has been shown that mothers with postnatal anxiety show maladaptive and inappropriate coping mechanisms leading to dysfunctional relationships with their developing children (15). At the same time, postnatal depression has also been linked to adverse outcomes such as low infant body weight, and increased physical morbidity in infants, including conditions like diarrhea and vitamin deficiencies (16).

Moreover, epidemiological research consistently reveals elevated levels of co-occurrence between depressive and anxiety disorders (17–19). A study in the Netherlands found that among individuals having a depressive disorder, a whopping 67% concurrently experienced an anxiety disorder (20). Conversely, among those who have an anxiety disorder as well, 63% also had a concurrent depressive disorder (21). Moreover, the study highlighted that in 57% of cases with co-existing conditions, anxiety manifested before depression, while in 18%, depression came before anxiety. Findings from the U.S.-based National Comorbidity Survey, involving over 8,000 individuals in community settings, support the notion that anxiety disorders usually come before depressive disorders (22). Despite the escalating prevalence of postpartum anxiety and the documented co-occurrence of postnatal anxiety with postnatal depression, both of which have adverse impacts on child development, there remains a lack of comprehensive research on these issues particularly in the context of low- and middle-income countries (23).

The present study stands as the first study of post-natal anxiety as well as the comorbidity of postnatal anxiety and depression in Sudan to better understand its clinical correlates. The objectives of the research are to understand the prevalence of postpartum anxiety disorder independently from postnatal depression and estimate the prevalence of the comorbid state with depression.

2 Methods

2.1 Subjects and instruments

The present study involved the recruitment of participants from two prominent postnatal clinics situated in the capital city of Sudan, Khartoum. Potential participants were approached and provided with a detailed leaflet elucidating the study's objectives, the nature of the questionnaires employed, and the assurance of strict confidentiality. Out of the 600 women who visited these clinics during the four-month study period (April–August 2014), 468 voluntarily agreed to participate in the study. Therefore, all postnatal women who visited these centers during the study period were invited to take part in the study. Only those, who declined to take part on the study were exclude.

Upon consenting to partake in the research, women were asked to complete a comprehensive Personal Information Questionnaire (PIQ), designed to gather sociodemographic details, information regarding past and present psychiatric illnesses, family medical history, existing social support structures, and current financial status. The assessment of anxiety and depression levels was conducted using the HADS, which comprises two subtests specifically targeting anxiety (A) and depression (D). Additionally, the intensity of depressive symptoms was independently measured using the BDI. HADS scale has undergone validation as a highly sensitive tool for identifying symptoms related to depression and anxiety, contrasting using the Edinburgh Depression Scale (EDS), which primarily demonstrates sensitivity specifically to depressive disorders during the perinatal period. Additionally, HADS as well as BDI have been validated within the cultural context. Therefore, our methodology is aimed to ensure a rigorous and thorough examination of the participants' postnatal emotional well-being, considering various socio-demographic factors and psychiatric history (16, 24, 25).

2.2 Assessments

Assessments were carried out by two psychiatrists assisted by 4 research psychologists. Three-day training course and pilot study resulted in a high inter-rater reliability of 96% between the research team and data collectors. During the study, participants engaged in one-on-one sessions to fulfill the requirements of the research, which included the completion of the PIQ, HADS, and BDI. Throughout these interactions, any queries posed by the participants were met with sensitive responses, and pertinent guidance was provided as needed. The PIQ was employed to collect comprehensive socio-demographic data concerning candidates, with a specific focus on significant personal, familial, and current psychiatric histories, as well as physical ailments, in addition to social stressors and situations.

The second survey utilized standardized HADS to assess symptoms of anxiety and depression, gauging distress levels through self-reported responses. This instrument is

10.3389/fpubh.2024.1446494

TABLE 1 Socio-demographic characteristics.

Characteristic	Number	Percentage (%)
Age		
25–35 years	275	59.14%
36–45 years	142	30.54%
46–55 years	48	10.32%
Educational level		
Undergraduates	410	88.17%
Illiterates	55	11.83%
Occupation		
Housewives	225	48.39%
Other	240	51.61%
Socioeconomic background		
Low	327	70.32%
Medium	89	19.14%
High	49	10.54%
Presence of a helping hand at home		
Yes	217	46.67%
No	248	53.33%
Relationship with husband		
Good	371	79.78%
Average	64	13.79%
Poor	30	6.43%
Family history of psychiatric disorders		
Yes	282	60.65%
No	183	39.35%

psychometrically robust in identifying emotional distress during the postnatal stage. Comprising fourteen items rated on a Likert-type scale with 4 points, HADS includes subscales for anxiety and depression assessment. The seven items for each subscale result in a score ranging from 0 to 21, with designated cut points: normal (0–7), mild mood disturbance (8–10), moderate mood disturbance (11–14), and severe ones (12–21). The HADS scale is widely used as a sensitive tool for detecting anxiety and depression symptoms, particularly in comparison to the widely used Edinburgh Depression Scale (EDS), which primarily focuses on depressive symptoms in the peripartum. HADS as well as BDI instruments have undergone successful validation within the Sudanese cultural context.

In addition, a third questionnaire, BDI, was employed to confirm/validate the depressive symptoms reported and identified by HADS and to understand the extent of depressive illness. BDI, consisting of 21 items containing a Likert-type scale, records symptoms on a scale from 0 to 3 (0 indicating the absence of symptoms and 3 signifying severe symptoms). BDI yields a score from 0 to 63, and a score (18–23) indicates moderate depression, while a score (23) and above indicates severe depression.

2.3 Compliance with ethical standards

All the performed procedures contained in this study were according to the ethical standards of the Research Board of the Faculty of Medicine, University of Khartoum, and that of the Helsinki Declaration 1964, along with its later amendments or comparable ethical standards. Formal permissions were received from all relevant hospital administrations. Written consent was taken from all participants, who were provided with an information leaflet explaining the study procedures and confidentiality.

2.4 Data analysis

Analysis of data was performed using SPSS Version 22.0 to get quantitative and descriptive statistical measurements. Student *t*-test and Chi-square test were measured along *p*-values for significant correlates. The percentage of prevalence was worked out besides calculating frequencies of important correlates and indicated significance via *p*-values. Furthermore, Multiple linear regression analysis was applied to gauge risk factors for postnatal anxiety and depression. This was applied to most well cited risks factors associated with these disorders. The prevalence of anxiety was determined through the HADS A subtest, and the deduction of moderate to severe values of BDI cases from the total patients with high comorbid values in HADS total scores further contributed to the comprehensive analysis of anxiety prevalence. Further, regression tests were carried out to gauge potential risk factors and causal associations.

3 Results

3.1 Social demographic characteristics

Table 1 presents a comprehensive overview of the social demographic characteristics of the study participants. Most women in the study fell within the 25–35 age range, comprising 59.14% of the sample (mean age 36.4 ± 1.6). In terms of education, a significant proportion of participants were undergraduates (88.17%), while 11.83% reported being illiterate. This diversity in educational backgrounds is crucial for understanding potential variations in health literacy and coping mechanisms (Figure 1).

3.2 Clinical characteristics

Table 2 provides insights into the distribution of psychiatric disorders (either anxiety/depression or comorbid condition), revealing that more than half of the cases (52.50%) are detected using HADS while 221 (47.5%) did not show high symptoms of depression or anxiety. This underscores the significance of employing a comprehensive assessment tool like HADS, which captures a broader spectrum of emotional distress, including anxiety and depression. Beck, while contributing significantly, reflects a narrower focus (20.9%) on depressive disorders.

Table 3 provides a comprehensive overview of the prevalence of mixed depression and anxiety symptoms during postnatal periods,

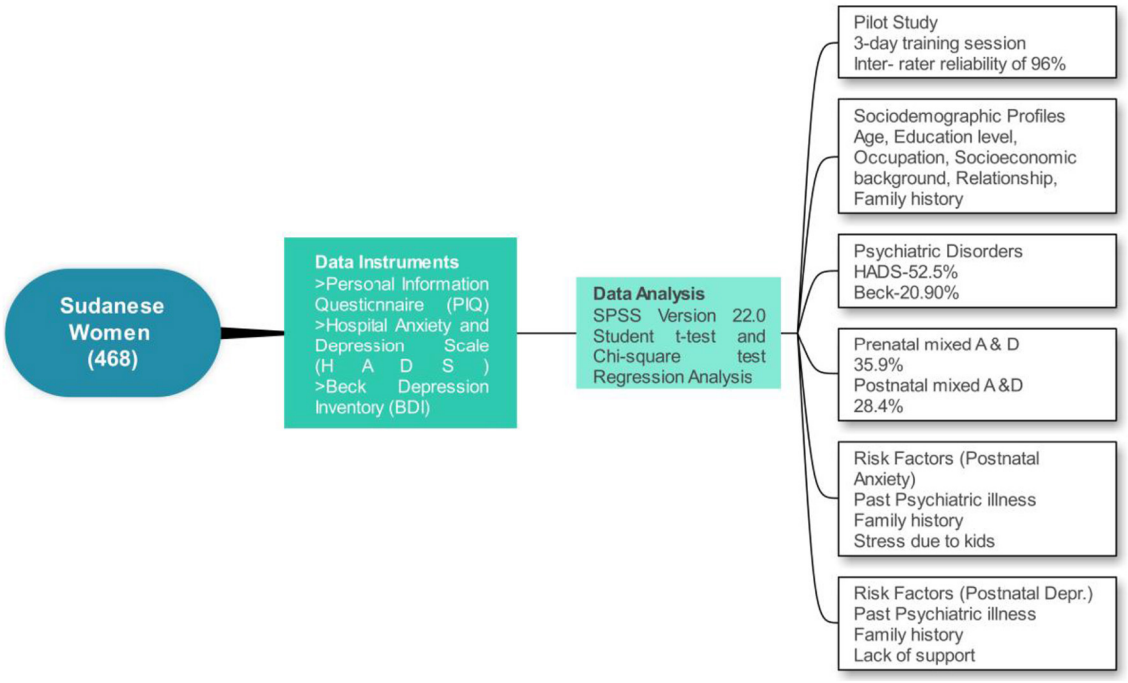


FIGURE 1
Sketch of methods and results of the study.

TABLE 2 Distribution of psychiatric disorders.

	Number	Percentage
HADS	244	52.50%
Beck	97	20.90%
Total	465	100.00%

TABLE 3 Mixed anxiety and depressive symptoms' prevalence in postnatal period using HADS.

Severity level	Postnatal (number)	Postnatal (percentage)
Normal	261	56.13%
Mild	132	28.39%
Moderate	84	18.06%
Severe	48	10.32%
Total	465	100.00%

employing the HADS with the severity levels encompassing normal, mild, moderate, and severe symptoms. According to the results, 28.4% showed high levels of distress postnatally showing moderate to severe symptoms.

Table 4 presents a correlation analysis of various risk factors with postnatal anxiety and depression among study participants. The findings reveal several noteworthy associations. Participants with a history of psychiatric illness exhibit a strong positive correlation with postnatal anxiety (HADS) and a moderate correlation with depression (Beck), suggesting a connection between past mental health experiences and current emotional wellbeing. Similarly, a family history of psychiatric illness demonstrates a positive correlation with postnatal anxiety and depression, again with a slightly stronger association observed for anxiety.

In Table 5, the regression coefficients (β) reveal significant insights into the factors influencing postnatal anxiety. Notably, a history of past psychiatric illness ($\beta = 0.25$, $p = 0.000$), a family history of psychiatric illness ($\beta = 0.15$, $p = 0.002$), and stress due to the number of children ($\beta = 0.32$, $p = 0.000$) emerge as significant positive predictors of postnatal anxiety. These findings suggest that addressing historical psychiatric issues, family history, support systems, and socioeconomic factors is crucial in managing postnatal anxiety.

Table 6 focuses on postnatal depression, with results indicating distinct predictor impacts. Past psychiatric illness ($\beta = 0.52$, $p = 0.000$), family history of psychiatric illness ($\beta = 0.25$, $p = 0.02$), and stress due to the number of children ($\beta = 0.36$, $p = 0.002$) are identified as significant positive contributors to postnatal depression. Lack of support ($\beta = 0.17$, $p = 0.005$) and a hostile non-supportive partner ($\beta = 0.15$, $p = 0.002$) also exhibit significant positive associations. In contrast, low socioeconomic status ($\beta = 0.028$, $p = 0.008$) demonstrates a weaker positive association and physical morbidity shows no significant impact on postnatal depression.

Table 7 provides an understanding of the distribution of risk factors and the prevalence of mixed anxiety and depressive symptoms during the postnatal period. Notably, the number of

10.3389/fpubh.2024.1446494

TABLE 4 Correlation analysis of risk factors with postnatal anxiety and depression.

Risk factors	Postnatal anxiety (HADS)	Postnatal depression (Beck)
Past psychiatric illness	0.45	0.25
Family history of psych. illness	0.45	0.35
Lack of support	0.35	0.35
Hostile non-supportive partner	0.43	0.32
Low socioeconomic status	0.44	0.25
Stress due to the number of kids	0.55	0.30
Physical morbidity	0.32	0.24

TABLE 5 Regression analysis pertaining to risk factors for postnatal anxiety (HADS).

	Regression coefficients (β)	p-value
Past psychiatric illness	0.25	0.000
Family history of psych. illness	0.15	0.002
Lack of support	−0.15	0.035
Hostile non-supportive partner	−0.12	0.020
Low socioeconomic status	−0.25	0.002
Stress due to number of kids	0.32	0.000
Physical morbidity	0.25	0.055

children in a family exhibits a gradient effect on symptom severity, with 52 cases classified as normal, 75 as mild, 85 as moderate, and 20 as severe in families with 0–4 children. In families with 5–10 children, 34 cases are normal, 17 are mild, 21 are moderate, and 28 are severe. This highlights a progressive increase in symptom severity with larger family sizes. The quality of the marital relationship emerges as a pivotal factor, with the absence of normal cases in poor relationships and an escalation of severity from mild to severe.

Individuals with a history of psychiatric depression face heightened vulnerability, evident in the higher prevalence of severe symptoms (42 cases) compared to those without such a history (89 cases). Co-morbidities with pregnancy amplify symptom severity, emphasizing the need for integrated healthcare approaches. Family history of psychiatric illness consistently influences severity levels, with individuals having a family history displaying higher prevalence across various severity levels.

TABLE 6 Regression analysis pertaining to risk factors for postnatal depression (Beck).

	Regression coefficients (β)	p-value
Past psychiatric illness	0.52	0.000
Family history of psych. illness	0.25	0.02
Lack of support	0.17	0.005
Hostile non-supportive partner	0.15	0.002
Low socioeconomic status	0.028	0.008
Stress due to number of kids	0.36	0.002
Physical morbidity	0.12	0.095

4 Discussion

This study represents the first comprehensive investigation into postnatal anxiety and depression among Sudanese women, addressing a significant research gap in the understanding of maternal mental health within this population in under-resourced settings. Through a meticulous examination of sociodemographic factors and psychiatric history, we aimed to understand the prevalence, correlates, and comorbidity of postpartum emotional disorders, particularly focusing on anxiety and depression. Employing a robust methodology, we recruited participants from prominent postnatal clinics in Khartoum and administered validated assessment tools, including the HADS and the BDS, to measure anxiety and depression symptoms.

The distribution of psychiatric disorders (either depression/anxiety or mixed condition) showed 52.50% of the cases as detected using HADS while Beck reflected a narrower focus (20.9%) on depressive disorders. In the postnatal period, a substantial proportion (28.4%), showed high levels of distress in the category of moderate to severe symptoms. Family history of psychiatric illness and past psychiatric history of disorders correlated positively with the emergence of emotional disorders. The results revealed that apart from depression as a widely acknowledged mental health issue in the postnatal period, the manifestation of anxiety alone or in the co-morbid state with depression is significant. These findings underscore the importance of tailored interventions specifically for the vulnerable population in resource-limited countries. Therefore, in addition to focusing on postnatal depression which has been studied more frequently in the postnatal context, we must recognize and address postnatal anxiety and comorbid states, given their high prevalence (as observed in our study) and impact on maternal mental health. Our recent study underscores the importance of considering comorbid conditions, particularly in resource-limited countries.

Postnatal anxiety disorders, as revealed in our research, constitute a significant portion of postnatal emotional disorders and merit equal attention in maternal mental health initiatives. In a review of pre- and postnatal psychological wellbeing in

TABLE 7 Risk factors associated with mixed anxiety and depression.

Risk factors	No. of children		Marital relation-ship			Past psychiatric depression		Co-morbidity with pregnancy		Family history of psychiatric illness		Physical illness	
	0–4	5–10	Good	Average	Poor	Yes	No	Yes	No	Yes	No	Yes	No
Normal	52	34	62	14	0	13	80	13	80	23	80	116	349
Mild	75	17	76	4	0	23	98	80		21	115	–	–
Moderate	85	21	142	18	0	37	83	24	97	38	55	–	–
Severe	20	28	100	45	4	42	89	31	140	48	85	–	–
Total	232	100	380	81	4	115	350	148	317	130	335	116	349

Africa, depression was found to be the most studied disorder, with prevalence rates of 18.3% after birth and 11.3% before birth (pregnancy). Rates for anxiety in the prenatal and postnatal periods were 14.8% and 14.0%. Higher prevalence was observed in low- to middle-income countries (11) which is also corroborated by this study.

Furthermore, the co-existence of postpartum anxiety and depression was identified in various studies. For instance, in a study involving 798 women, a significant association was identified between postnatal anxiety and depression calculated according to DSM-IV criteria (26). Moreover, in women from a maternity ward, 40% of postpartum individuals exhibited elevated anxiety which was diagnosed by the State-Trait Anxiety Inventory, and a noteworthy correlation was found between postnatal anxiety and depression (27). In a more extensive survey, 18% of 4,451 postnatal women showed symptoms of postnatal anxiety (28). Among these, 35% also reported symptoms of postpartum depression. This work highlights the significance of some correlated factors in relation to the emergence of postnatal emotional distress that were previously found in different cultures. Moreover, it sheds light on the understanding of the comorbid nature and spectrum of symptoms that this condition presents with.

The literature extensively investigates various risk factors associated with postpartum depression. Strong predictors include a history of depression or anxiety during pregnancy, as well as a previous depressive illness. Additionally, life stress and inadequate social support demonstrate a moderate to severe effect size in predicting postpartum depression (29, 30). In this study, hostile and non-supportive partners, family history and past psychiatric history of affective disorder correlated positively with the emergence of post-natal emotional disorders in agreement with previous findings, none of the other sociodemographic factors correlated significantly with the occurrence of postnatal emotional disorder.

The findings of this study contribute valuable insights into the prevalence and correlates of postnatal emotional disorders, particularly focusing on anxiety. The investigation addressed a critical gap in existing research, particularly in the context of developing countries, with a specific focus on Sudan. Additionally, the study shed light on the coexistence of anxiety and depression, emphasizing the need to explore these emotional disorders as a spectrum rather than isolated conditions.

The comorbidity of anxiety and depression during the postnatal period aligns with global research trends, with over 67% of comorbidity reported in community studies in the United States. One can fail to detect the extent of the emotional disturbance due to the use of an instrument that selectively detects one type of emotional disturbance either depression or anxiety. On the other hand, most postnatal instruments were found to be non-highly specific in detecting what supposed to measure.

Another important aspect to consider is the recent studies challenging the conventional nomothetic perspective on postnatal emotional disorders, positing that these conditions are not exclusively depressive or anxiety disorders. Instead, they are better comprehended as a spectrum of emotional disorders characterized by a blend of depressive and anxiety symptoms,

although occasionally manifesting in distinct forms. This nuanced conceptualization sheds light on the heterogeneous nature of postnatal emotional disorders, offering a more accurate and comprehensive framework for understanding the diverse manifestations of these conditions (31, 32). Future research on postnatal emotional disorders particularly in low-income countries needs to consider such reports.

5 Limitations of the study

The study's limitations warrant consideration. Firstly, the sample size, drawn from two primary care clinics in Khartoum, Sudan, may limit the generalizability of findings to broader populations of postnatal women, possibly overlooking diverse experiences and backgrounds. Moreover, reliance on self-reported measures for assessing anxiety and depression levels introduces potential biases, as well as limitations in reliance on self-report measures namely the HADS and the BDI, which operate on a self-report basis and may not always accurately represent the actual clinical diagnosis of postnatal emotional disorders. Addressing these limitations in future research could enhance understanding and intervention strategies for postnatal emotional disorders among diverse populations of women.

6 Conclusion

The distribution of psychiatric disorders (either depression/anxiety or mixed condition) showed that more than half of the cases (52.50%) were detected using HADS while 221 (47.5%) did not show significant symptoms clinically. Beck, while contributing significantly, reflects a narrower focus (20.9%) on depressive disorders. In the postnatal period, a substantial proportion (28.4%), showed high levels of distress in the category of moderate to severe symptoms. Family history of psychiatric illness and past psychiatric history of disorders correlated positively with the emergence of emotional disorders. In agreement with previous findings, none of the other sociodemographic factors correlated significantly with the occurrence of postnatal emotional disorder.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Research Board Council of the Faculty of Medicine, University of Khartoum. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AHO: Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. AO: Conceptualization, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. IO: Data curation, Formal analysis, Resources, Software, Writing – original draft, Writing – review & editing. TH: Conceptualization, Validation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Acknowledgments

Our great thanks go to all women, who agreed to participate in this study. The authors are indebted to Dr. Kaleem Ur Rahman N, who helped with writing the final version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Teissedre F, Chabol H. Postnatal depression: a study of the predictive effects of postnatal anxiety. *Ir J Psychol Med.* (2003) 20:111–4. doi: 10.1017/S0790966700007898

2. Finlayson K, Crossland N, Bonet M, Downe S. What matters to women in the postnatal period: a meta-synthesis of qualitative studies. *PLoS ONE.* (2020) 15:e0231415. doi: 10.1371/journal.pone.0231415

3. McQueen A, Mander R. Tiredness and fatigue in the postnatal period. *J Adv Nurs.* (2003) 42:463–9. doi: 10.1046/j.1365-2648.2003.02645.x

4. Mahdi A, Dembinsky M, Bristow K, Slade P. Approaches to the prevention of postnatal depression and anxiety - a review of the literature. *J Psychosom Obstet Gynaecol.* (2019) 40:250–63. doi: 10.1080/0167482X.2018.1512577

5. Freedman RL, Lucas DN. MBRRACE-UK: saving lives, improving mothers' care - implications for anaesthetists. *Int J Obstet Anesth.* (2015) 24:161–73. doi: 10.1016/j.ijoa.2015.03.004

6. Richards JP. Postnatal depression: a review of recent literature. *Br J Gen Pract.* (1990) 40:472–6.

7. Patel M, Bailey RK, Jabeen S, Ali S, Barker NC, Osiezagha K, et al. Postpartum depression: a review. *J Health Care Poor Underserved.* (2012) 23:534–42. doi: 10.1353/hpu.2012.0037

8. Chow R, Huang E, Li A, Li S, Fu SY, Son JS, et al. Appraisal of systematic reviews on interventions for postpartum depression: systematic review. *BMC Pregnancy Childbirth.* (2021) 21:1–11. doi: 10.1186/s12884-020-03496-5

9. Almeida OP, Draper B, Pirkis J, Snowdon J, Lautenschlager NT, Byrne G, et al. Anxiety, depression, and comorbid anxiety and depression: risk factors and outcome over two years. *Int Psychogeriatr.* (2012) 24:1622–32. doi: 10.1017/S1041610212 00107X

10. Pollack MH. Comorbid anxiety and depression. *J Clin Psychiatry.* (2005) 66:22.

11. Dennis C-L, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. *Br J Psychiatry.* (2017) 210:315–23. doi: 10.1192/bjp.bp.116.187179

12. Ilias MR. *Perinatal Depressive Symptoms and Anxiety: Importance for African American Mothers and their Babies.* Baltimore, MD: The Johns Hopkins University (2009).

13. Molfese VJ, Bricker MC, Manion LG, Beadnell B, Yaple K, Moires KA, et al. Anxiety, depression and stress in pregnancy: a multivariate model of intrapartum risks and pregnancy outcomes. *J Psychosom Obstet Gynaecol.* (1987) 7:77–92. doi: 10.3109/01674828709019593

14. Stein A, Craske MG, Lehtonen A, Harvey A, Savage-Mcglynn E, Davies B, et al. Maternal cognitions and mother–infant interaction in postnatal depression and generalized anxiety disorder. *J Abnorm Psychol.* (2012) 121:795. doi: 10.1037/a0026847

15. George A, Luz RF, De Tychey C, Thilly N, Spitz E. Anxiety symptoms and coping strategies in the perinatal period. *BMC Pregnancy Childbirth.* (2013) 13:1–6. doi: 10.1186/1471-2393-13-233

16. Osman AH, Hagar TY, Osman AA, Suliaman H. Prevalence of depression and anxiety disorders in peri-natal Sudanese women and associated risks factors. *Open J Psychiatry.* (2015) 5:342. doi: 10.4236/ojpsych.2015.54039

17. Broekman BF, Chan YH, Chong YS, Kwek K, Cohen SS, Haley CL, et al. The influence of anxiety and depressive symptoms during pregnancy on birth size. *Paediatr Perinat Epidemiol.* (2014) 28:116–26. doi: 10.1111/ppe.12096

18. Falah-Hassani K, Shiri R, Dennis CL. Prevalence and risk factors for comorbid postpartum depressive symptomatology and anxiety. *J Affect Disord.* (2016) 198:142–7. doi: 10.1016/j.jad.2016.03.010

19. Ned H, Kalin MD. The critical relationship between anxiety and depression. *Am J Psychiatry.* (2020) 177:365–7. doi: 10.1176/appi.ajp.2020.20030305

20. Lamers F, Van Oppen P, Comijs HC, Smit JH, Spinhoven P, Van Balkom AJ, et al. Comorbidity patterns of anxiety and depressive disorders in a large cohort study: the Netherlands Study of Depression and Anxiety (NESDA). *J Clin Psychiatry.* (2011) 72:3397. doi: 10.4088/JCP.10m06176blu

21. Davis LL, Rush JA, Wisniewski SR, Rice K, Cassano P, Jewell ME, et al. Substance use disorder comorbidity in major depressive disorder: an exploratory analysis of the sequenced treatment alternatives to relieve depression cohort. *Compr Psychiatry.* (2005) 46:81–9. doi: 10.1016/j.comppsych.2004.07.025

22. Kessler RC, Dupont RL, Berglund P, Wittchen H-U. Impairment in pure and comorbid generalized anxiety disorder and major depression at 12 months in two national surveys. In: Hyman S, editor. *Fear and Anxiety.* London: Routledge (2013), p. 35–44.

23. Field T. Postnatal anxiety prevalence, predictors and effects on development: a narrative review. *Infant Behav Dev.* (2018) 51:24–32. doi: 10.1016/j.infbeh.2018.02.005

24. Abdel-Khalek AM. Internal consistency of an Arabic adaptation of the beck depression Inventory in four Arab countries. *Psychol Rep.* (1998) 82:264–6. doi: 10.2466/pr0.1998.82.1.264

25. El-Rufaie OE, Absood GH. Retesting the validity of the Arabic version of the Hospital Anxiety and Depression (HAD) scale in primary health care. *Soc Psychiatry Psychiatr Epidemiol.* (1995) 30:26–31. doi: 10.1007/BF00784431

26. Reck C, Noe D, Gerstenlauer J, Stehle E. Effects of postpartum anxiety disorders and depression on maternal self-confidence. *Infant Behav Dev.* (2012) 35:264–72. doi: 10.1016/j.infbeh.2011.12.005

27. Polachek IS, Harari LH, Baum M, Strous RD. Postpartum anxiety in a cohort of women from the general population: risk factors and association with depression during last week of pregnancy, postpartum depression and postpartum PTSD. *Israel J Psychiatry.* (2014) 51:128.

28. Farr SL, Dietz PM, O'hara MW, Burley K, Ko JY. Postpartum anxiety and comorbid depression in a population-based sample of women. *J Womens Health.* (2013) 23:120–8. doi: 10.1089/jwh.2013.4438

29. Zachariah R. Social support, life stress, and anxiety as predictors of pregnancy complications in low-income women. *Res Nurs Health.* (2009) 32:391–404. doi: 10.1002/nur.20335

30. McCoy SJB, Beal JM, Shipman SBM, Payton ME, Watson GH. Risk factors for postpartum depression: a retrospective investigation at 4-weeks postnatal and a review of the literature. *J Osteopath Med.* (2006) 106:193–8.

31. Premji SS, Lalani S, Shaikh K, Mian A, Forcheh N, Dosani A, et al. Comorbid anxiety and depression among pregnant Pakistani women: higher rates, different vulnerability characteristics, and the role of perceived stress. *Int J Environ Res Public Health.* (2020) 17:7295. doi: 10.3390/ijerph17197295

32. Howard K, Maples JM, Tinius RA. Modifiable maternal factors and their relationship to postpartum depression. *Int J Environ Res Public Health.* (2022) 19:12393. doi: 10.3390/ijerph191912393

frontiers | Frontiers in Public Health

TYPE Systematic Review
PUBLISHED 01 October 2024
DOI 10.3389/fpubh.2024.1434624

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Dorota Pilecka,
Poznan University of Physical Education, Poland
Zulkaif Ahmed Saqib,
Shenzhen Technology University, China

*CORRESPONDENCE
Hao Lin
✉ linhao@cdu.edu.cn

RECEIVED 18 May 2024
ACCEPTED 23 September 2024
PUBLISHED 01 October 2024

CITATION
Lin H, Zhu Y, Liu Q and Li S (2024) The mediating effect of resilience between physical activity and mental health: a meta-analytic structural equation modeling approach.
Front. Public Health 12:1434624.
doi: 10.3389/fpubh.2024.1434624

The mediating effect of resilience between physical activity and mental health: a meta-analytic structural equation modeling approach

Hao Lin[1]*, Yuying Zhu[1], Qingzao Liu[1,2] and Shan Li[1]

[1]College of Physical Education, Chengdu University, Chengdu, China, [2]School of Economics and Management, Shanghai University of Sport, Shanghai, China

Background: While the correlation between physical activity (PA) and mental health is well known, the mediating mechanism of resilience between the two variables remains unclear.

Objectives: To systematically evaluate the relationship between PA and mental health, and explore the mediating role of resilience between them.

Methods: A systematic search of electronic databases (PubMed, Web of Science, ProQuest, Ebsco, China Knowledge, and China Biomedical Database) was conducted to identify relevant studies, and meta-analytic procedures were used to assess the strength of the relationships between PA and mental health. Furthermore, a meta-analytic structural equation model (MASEM) was used to assess the mediating effects of resilience, ensuring the reliability of our findings.

Results: The findings of 15 studies (17,043 subjects) were subjected to meta-analysis and route analysis. The findings of the meta-analysis revealed a statistically significant positive correlation of 0.288 (95% CI, 0.166–0.402) between PA and positive indicators of mental health, as well as a statistically significant negative correlation (95% CI, −0.342 to −0.171) with negative indicators of mental health. Furthermore, the results of MASEM path analysis indicated that PA may indirectly impact both positive and negative indicators of mental health through the mediating factor of resilience. The indirect effect values were 0.108 (95% CI, 0.080–0.141) and −0.074 (95% CI, −0.100 to −0.051), respectively, accounting for 40.15% of the total effect value and 28.91%.

Conclusion: Physical activity is positively correlated with positive indicators of mental health and negatively correlated with negative indicators of mental health. Moreover, PA can positively influence mental health through the mediating role of resilience.

KEYWORDS

physical activity, mental health, resilience, meta-analysis, structural equation modeling

1 Introduction

With the advancement of civilization and the accelerated pace of individuals' lives, mental health has gradually received societal focus and emerged as a prominent area of research in various fields, including psychology, preventive medicine, and epidemiology. Researchers have proposed a two-factor model of mental health influenced by the principles of positive psychology. This model suggests that mental health is not simply the absence of mental illness but a condition that encompasses the presence of positive indicators, such as life satisfaction, and the absence of negative indicators, such as depression (1–3). Measures of positive indicators of mental health primarily used the Positive Mental Health Scale (PMH-scale) (4), the WHO Happiness Index (5), the Psychological General Well-Being Index (PGWBI) (6), and the Life Satisfaction Scale (7). Negative indicators were measured using the Center for Epidemiologic Studies Depression Scale (CES-D) (8), the Depression Anxiety Stress Scale (DASS-21) (9), the GAD-7 Anxiety Disorder Scale (10), and the SAS-2 Anxiety Questionnaire (11). While there may be variations in the aforementioned measures, the scales themselves encompass the positive and negative signs of mental health, respectively. Therefore, the proposal and application of the two-factor model of mental health lay a solid foundation for a more comprehensive and accurate assessment of an individual's mental health.

1.1 The relationship between PA and mental health

Among the various determinants influencing mental health, physical activity (PA) has become a well-known factor. Intervention studies have demonstrated the effectiveness of PA in treating depression (12, 13) and anxiety (14, 15). Furthermore, observational studies have provided evidence that PA is negatively correlated with negative indicators of mental health such as depression (16, 17), anxiety, and stress (18–20) symptoms. Engaging in PA that involves self-entertainment for psychological gratification may help alleviate adverse emotions and influence human health or subjective well-being (21). Epidemiologic studies indicate that PA is associated with certain indicators of subjective well-being (22) and that engaging in moderate-intensity physical activity positively affects mood (23). Therefore, most studies have shown that PA can directly influence mental health by enhancing individuals' mental state and reducing negative emotions. However, Hearon et al. (24) found a positive correlation between anxiety sensitivity and PA in adult individuals (r=0.43). Established meta-analyses have mostly explored the impact of PA on mental health with pooled intervention studies (14, 25). Conversely, correlational meta-analyses only considered the relationship between PA and single indicators of mental health (26, 27). The validity and practicality of applying the two-factor model in meta-analysis studies of mental health were verified in the study conducted by Hu et al. (28). Therefore, a meta-analysis of the correlation between PA and mental health using the two-factor model of mental health would allow for more comprehensive results.

1.2 Mediating effects of resilience

With the advancement of comprehensive research, current researchers are increasingly focusing on the mediating processes through which PA influences mental health. These mechanisms encompass various variables, including resilience, social support, self-efficacy, and psychological capital. An examination of existing literature indicates that most studies have concentrated on investigating the influence of resilience on mental health. Resilience refers to an individual's ability or trait to cope with stress, frustration, and trauma. It is a crucial positive psychological quality (29) with an intricate and multidimensional relationship with PA and mental health (30). Researchers found a positive correlation between PA and resilience (31, 32). Individuals' psychological resilience improves with regular PA (33), while the fulfillment of individual psychological needs further improves resilience during exercise (34). Numerous empirical studies have found that resilience is positively correlated with positive indicators of mental health (35) and negatively correlated with negative indicators of mental health (36, 37). Moreover, resilience can be projected to predict mental health indicators, such as life satisfaction (38), depression (39), and anxiety (40). Empirical studies have confirmed the mediating effect played by resilience between PA and mental health; however, the findings are divergent. Some studies have suggested that resilience plays a partial mediating role in the effect of PA on mental health (41, 42); others have suggested that there is no significant correlation between indicators of PA and mental health after controlling for the variable of resilience (43). Yet, researchers have not used the method of meta-analysis to elucidate the mediating role of resilience and uncover the mechanism by which PA affects mental health. Hence, this gap in the literature emphasizes the need to address this important research void.

1.3 Objectives and hypotheses

Considering the lack of consistency in the current research on the relationship between PA and mental health and the possible mediating role of resilience between the two, it is necessary to summarize and analyze the existing findings. Therefore, the primary aim of this study was to assess the strength of the relationship between PA, resilience, and mental health by conducting a meta-analysis of the relevant literature. This analysis would involve constructing a joint correlation matrix among the three variables based on the results of the meta-analysis. Finally, this study aimed to confirm the mediating role of resilience using Structural Equation Modeling. Reviewing the current research, we anticipated a substantial positive correlation between PA and positive indicators of mental health, as well as a significant negative correlation with negative indicators of mental health. We also expected that PA could have a positive impact on positive indicators of mental health and a negative impact on negative indicators of mental health mediated by resilience.

2 Materials and methods

2.1 Literature retrieval

The systematic review and meta-analysis were conducted in strict adherence to PRISMA guidelines. We searched for the terms sport*/physical activi*/exercis*; resilience/resilient; "life satisfaction"/"positive emotion"/well-being/"positive mood"/mental health/depression/anxiety/"negative emotion"/"negative mood" in databases such as PubMed, Web of Science, ProQuest, Ebsco, China Knowledge, and China Biomedical Database. To identify literature published from its

establishment to November 2023. Initially, the following criteria were met: the source of the literature was journal articles, the research content was the relationship between PA and mental health (positive and negative indicators), and the language of the literature was written in Chinese/English. Finally, 3,493 papers were retrieved.

2.2 Inclusion and exclusion criteria

The selection of literature was based on the following criteria: (a) the required studies must be empirical and published (mainly cross-sectional studies, longitudinal studies use baseline data); (b) these studies must cover predictor, mediator, and outcome variables, i.e., PA, resilience, and mental health (which can be measured through any of life satisfaction, subjective well-being, positive affect, depression, anxiety, and negative affect); (c) the sample size and correlation coefficient, or other indicators of transformable data, must be reported; (d) for literature that repeatedly used the same set of data, the earliest one was selected. Figure 1 depicts the literature screening process.

2.3 Study coding

The literature data was encoded to incorporate the first author and year, sample size, effect size, and name of the mental health indicator. If the study included multiple samples, the effect sizes were calculated separately for each independent sample. Two researchers finally retrieved the material and conducted the coding separately. In cases of conflicts or inconsistencies, a third researcher was consulted to review and debate the differences and collaboratively resolve the issues. Table 1 depicts a total of 15 papers that were finally included in the present study.

2.4 Statistical methods

The effect size for the meta-analysis was determined to be the correlation coefficient r. Using Fisher's Z transformation, weighted average effect values were obtained for each group of relationships (44). The interconversion formula is shown below:

$$\text{Fisher}'\text{s } Z = 0.5 \times \ln\left(\frac{1+r}{1-r}\right)$$

$$V_z = 1/(n-3)$$

$$SE_z = \sqrt{V_z}$$

$$r = \left(e^{2z}-1\right)/\left(e^{2z}+1\right)$$

A statistical analysis of effect value merging, heterogeneity test, and publication bias was performed using CMA 3.7. The effect sizes were combined using a random-effects model, and the heterogeneity of the total effect sizes was evaluated using Q-values and I^2. Correlation coefficients and confidence intervals of 95% are provided in the study.

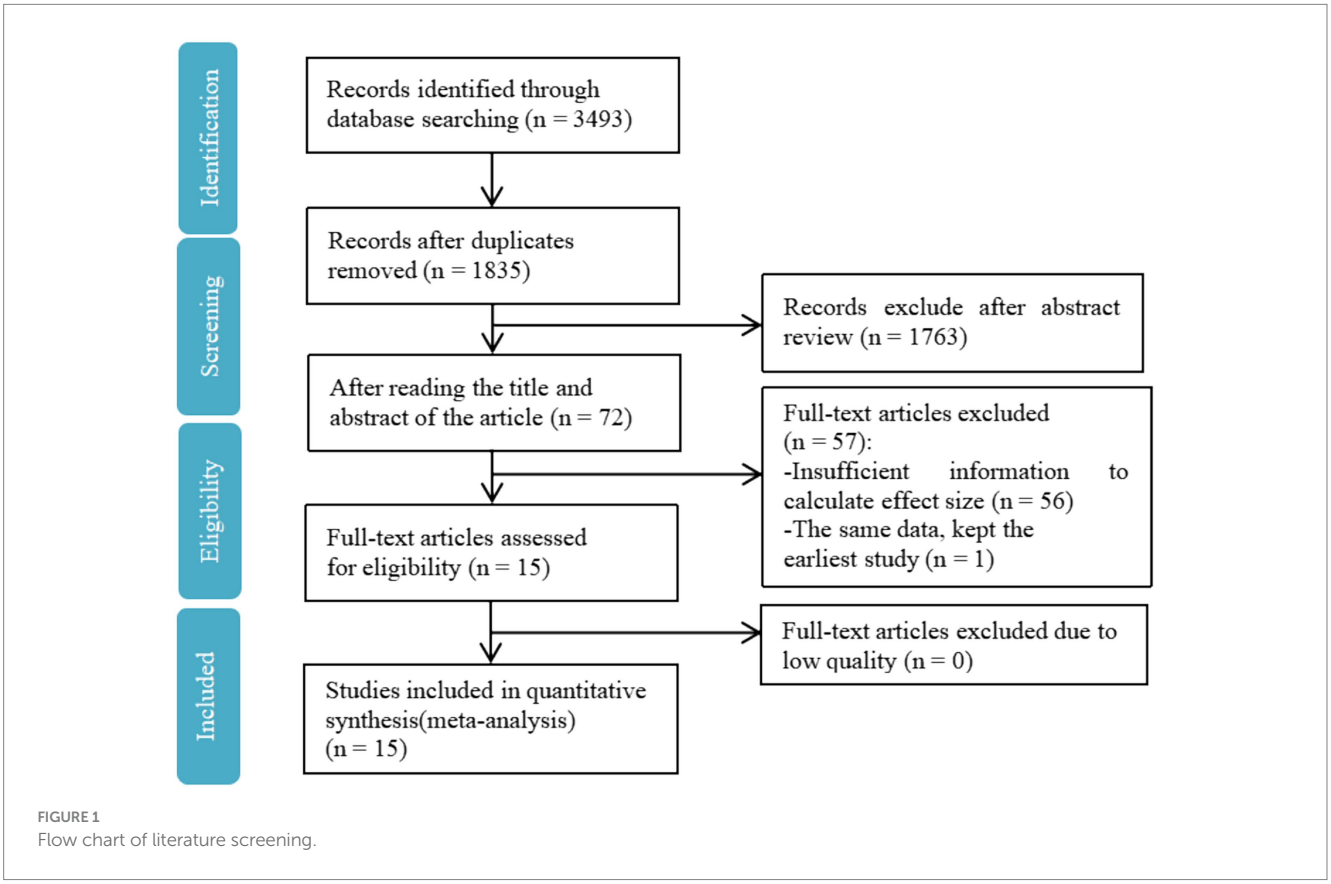


FIGURE 1
Flow chart of literature screening.

TABLE 1 Basic information on the included meta-analysis studies.

Author, year	Sample size	Mental health indicators	r_1	r_2	r_3	Subjects
Cocozza et al., 2020 (65)	1,182	SWB	0.150	0.240	0.46	Adult
Cui and Zhang, 2022 (66)	1,048	Negative indicator	0.301	−0.357	−0.366	Undergraduate
Ho et al., 2015 (67)	775	Positive indicator	0.250	0.660	0.440	Middle school student
Li et al., 2022 (43)	1,009	Life satisfaction	0.234	0.218	0.618	Elementary school students
Li et al., 2021 (68)	1,214	Negative indicator	0.470	−0.250	−0.330	Undergraduate
Liu, 2020 (41)	1,408	Negative indicator	0.253	−0.357	−0.355	Undergraduate
Wu et al., 2023 (69)	1,248	Positive indicator	0.290	0.210	0.590	Adult
Wu et al., 2022 (70)	402	Positive indicator	0.386	0.180	0.570	Adult
Xin et al., 2023 (71)	451	Anxiety	0.269	−0.301	−0.237	Older adult
Xu et al., 2018a (72)	2,282	Life satisfaction	0.297	0.123	0.254	Middle school student
Xu et al., 2018b (72)	2,282	Negative indicator	0.297	−0.137	−0.258	Middle school student
Yang et al., 2021 (61)	557	SWB	0.36	0.382	0.353	Older people
Zhang et al., 2023 (73)	3,143	SWB	0.249	0.247	0.467	Adolescent
Zhang, 2018 (74)	485	Depression	0.219	−0.315	−0.393	Older adult
Zhang et al., 2022 (75)	1,117	Negative indicator	0.098	−0.087	−0.304	Undergraduate
Zhou and Zhou, 2022 (42)	722	SWB	0.19	0.187	0.341	Undergraduate

r_1 is the correlation coefficient between PA and resilience; r_2 is the correlation coefficient between PA and mental health indicators; r_3 is the correlation coefficient between resilience and mental health indicators; SWB is subjective well-being.

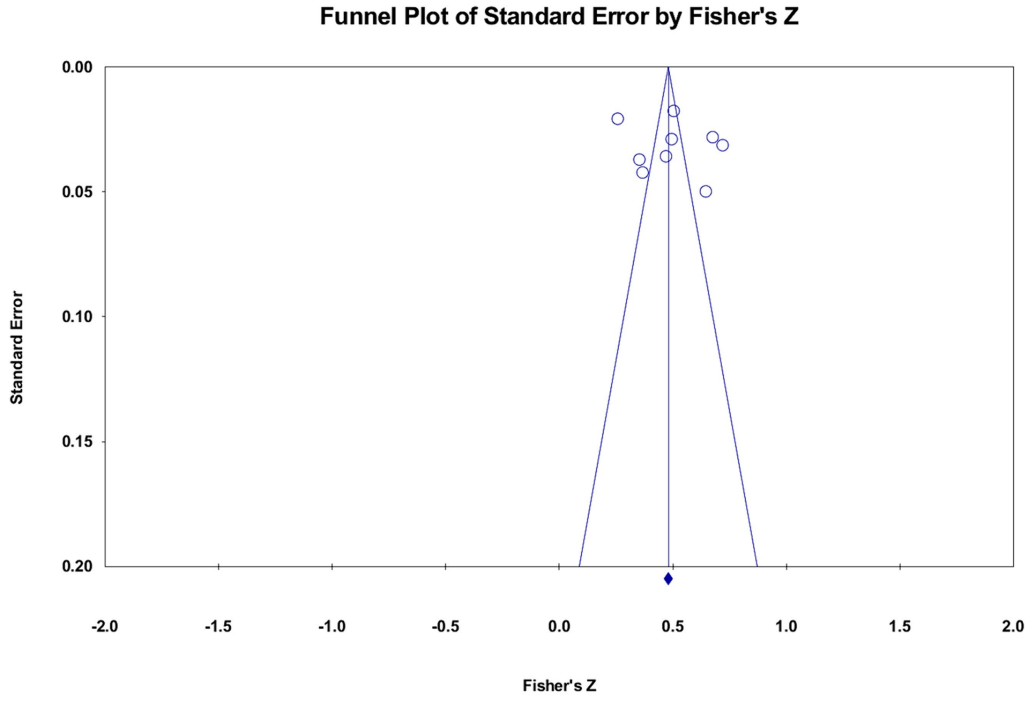


FIGURE 2
Funnel diagram.

Publication bias assessments were performed utilizing three methodologies: (a) Fail-safe numbers (Fail-safe *N*) were calculated to determine the number of insignificant studies that would need to be included to render the total effect value statistically insignificant (45). (b) A funnel plot was created to evaluate the existence of publication bias by visually analyzing the symmetry of the plot. If the effect values are predominantly clustered in the top middle of the funnel and exhibit symmetry, it suggests the absence of publication bias, as depicted in Figure 2. (c) If both the approaches above confirmed the presence of publication bias, the funnel plot was

10.3389/fpubh.2024.1434624

TABLE 2 Results of meta-analysis.

Variable relationship	*k*	*r*	95% Confidence interval		*z*	*p*	*Q*	df	*p*	I^2	Fail-safe *N*
			Lower limit	Up limit							
PA-PI	8	0.288	0.166	0.402	4.496	0.000	283.162	7	0.000	97.53%	1,149
Re-PI	8	0.463	0.362	0.552	8.082	0.000	249.462	7	0.000	97.19%	4,517
PA-NI	7	−0.259	−0.342	−0.171	−21.621	0.000	99.465	6	0.000	93.97%	875
Re-NI	7	−0.321	−0.360	−0.280	−29.069	0.000	22.667	6	0.001	73.53%	1,480

PA is PA; Re is resilience; PI is positive indicators of mental health; NI is negative indicators of mental health; *k* is the number of studies; *r* is the effect size.

rectified using the trim-and-fill method to derive an adjusted effect size (46).

Based on meta-analytic structural equation modeling (MASEM) theory, the path analysis and the mediating effects of resilience were validated by the great likelihood method using the WebMASEM application[1] (47).

3 Results

Fifteen articles containing 17,043 subjects were included in this study. Among them, 10 articles were studied in the adolescent and college student population; three were adults, and two were older adults.

3.1 Heterogeneity test

As depicted in Table 2, it was found that after testing, the I^2 values of all groups exceeded 70%, a high degree of heterogeneity in the included studies ($p < 0.01$), so it was more accurate to use a random effects model to combine the effect sizes.

3.2 Publication bias test

A visual evaluation using a funnel plot indicated that most of the effect values for each set of associations were clustered in the central top region of the funnel and were evenly distributed on both sides of the overall effect size. The fail-safe *N* measure was calculated (Table 2), which yielded a critical value greater than $5k + 10$ for each item. Furthermore, no other studies were identified for inclusion during the trim-and-fill process. Therefore, there was no publication bias in the current meta-analysis.

3.3 Main effects test

The mean weighted correlation coefficients between PA and positive indicators of mental health were 0.288 (95% CI, 0.166–0.402). Similarly, the average weighted correlation coefficients between resilience and positive indicators of mental health were 0.463 (95% CI, 0.362–0.552). Conversely, the average weighted correlation coefficients between PA and negative indicators of mental health were −0.259 (95% CI, −0.342 to −0.171), and between resilience and negative indicators of mental health were −0.321 (95% CI, −0.360 to −0.280). The results of the *z*-value and *p*-value indicated that these effect sizes were statistically significant. Based on Cohen's criteria (48), a value of $|r| \leq 0.10$ is considered a small effect, $|r| = 0.30$ is considered a medium effect, and $|r| \geq 0.50$ is considered a large effect. This suggests that there is a medium to high positive correlation between PA and resilience with positive indicators of mental health and a medium to high negative correlation with negative indicators of mental health.

3.4 Mediation effect test

The mediation effects of resilience were tested using the MASEM theory. Table 3 presents the joint correlation matrix, which was calculated using the Web MASEM application to obtain the results.

Second, the lavaan syntax[2] was composed. Path analyses and mediation effects tests were performed using the WebMASEM program. The fit indices of SEM showed that the model was saturated ($\chi^2 < 0.001$, df = 0, CFI = 1.00, TLI = 1.00, RMSEA = 0), indicating that the model fits well with the data.

Table 4 depicts the results of the test. Both PA and resilience can directly predict positive mental health indicators, with path coefficients of 0.161 (95% CI: 0.040–0.283) and 0.411 (95% CI: 0.316–0.506), respectively. PA can indirectly impact positive indicators of mental health by influencing resilience. The indirect effect value is 0.108 (95% CI: 0.080–0.141), allowing for 40.15% of the total effect value. PA and resilience had a direct negative impact on mental health, with path coefficients of −0.182 (95% CI: −0.0275 to −0.089) and −0.270 (95% CI: −0.319 to −0.221), respectively. Furthermore, PA indirectly affected negative indicators of mental health through the mediating effect of resilience, with an indirect effect value of −0.074 (95% CI: −0.100 to −0.051), accounting for 28.91% of the total effect value. The 95%

1 https://sjak.shinyapps.io/webMASEM/

2 Using the positive indicators of mental health as an example: the direct effects are # Regression coefficients; Re~b21*PA; PI~b31*PA+b32*Re; # Variances; PA~~1*PA; Re~~p22*Re; PI~~p33*PI; and the indirect effects are # Regression coefficients; Re~beta1*PA; PI~beta2*Re+PA; # Variances; PA~~1*PA; Re~~Re; PI~~PI.

confidence intervals for all effect sizes did not contain 0. Thus, the mediating role of resilience in the relationship between PA and mental health was established.

4 Discussion

PA has an important place in people's lives. Overall, engaging in PA can alleviate stress, regulate negative emotions, enhance life satisfaction, and foster mental well-being (49, 50). From a physiological perspective, engaging in PA leads to increased production and release of endorphins, decreased adrenaline levels, and stimulated logical thinking and reasoning abilities. Consequently, the most immediate outcome of PA is the experience of pleasure and a sense of well-being (51, 52). This is also indicated by our findings that PA is correlated with positive indicators of mental health and that PA can positively influence positive indicators of mental health. Increasing happy emotions during exercise can alleviate the impact of negative emotions and mitigate depression, anxiety, and work-related stress. Moreover, PA can play a crucial role in treating anxiety and depression by improving various physiological factors (53), as illustrated by the results of the present study, where PA showed a negative correlation with negative indicators of mental health. Nevertheless, researchers have already emphasized that the relationship between PA and mental health differs considerably across different life domains (27); moreover, certain specific groups, such as older adults (54) and smokers (55), may experience negative emotions due to the physical discomfort or risks associated with exercise. Hence, it is imperative to establish a scientific exercise prescription to implement exercise interventions for mental health issues. The advent of an information-driven and sophisticated society has resulted in a decline in the level of PA among people, which inevitably leads to mental health issues. It has been suggested that physical inactivity is the leading cause of death globally, which has a huge impact on the prevalence of non-communicable diseases such as mental health issues (56). Therefore, the impact of physical inactivity on mental health remains a concern for the future.

Resilience, an inherent quality or skill to deal with challenges, is closely linked to mental well-being. Individuals with a high level of resilience tend to have a more positive outlook on cognitive matters. The results of our study indicated a significant positive association between resilience and favorable mental health indicators. Moreover, resilience has a significant negative correlation with negative indicators. Researchers presented a comprehensive meta-analysis (28) that thoroughly clarifies the connection between resilience and mental health. Those who possess resilience are more capable of confronting challenges, positively dealing with them, seeking support, and effectively solving problems (57). This resilience acts as a protective shield, safeguarding individuals from the negative emotional effects of unfavorable occurrences (58). The findings of the present study indicate that the correlation between resilience and mental health is notably stronger than that of physical exercise. This could be attributed to the fact that resilience has a more immediate impact on mental health than PA (42). Furthermore, resilience, as a characteristic of one's personality, exhibits greater stability and a more robust association with an individual's mental well-being than physical exercise, which is an external protective factor. This trait of resilience suggests that it may mediate other distal variables affecting mental health. Therefore, this needs to be focused on in studying mental health issues.

Physical activity was a significant predictor of resilience, consistent with previous reports (59). Individual resilience is not static and can be influenced by both positive and negative factors (60). PA as a protective factor, PA can enhance the development of individual resilience (61). Research has shown that regular participation in PA can effectively reduce physiological stress levels, foster emotional balance, strengthen self-control, and boost mental well-being, thereby leading to increased levels of resilience (62). Moreover, resilience can be influenced by various factors, such as the type and intensity of activity and personal beliefs and habits (63). There are many intricate relationships between PA and resilience and mental health (30). This study is the first to investigate how resilience mediates PA and mental health using a meta-analytic structural equation model (MASEM). The results showed that PA not only directly affects mental health but also positively predicts positive indicators of mental health and negatively predicts negative indicators of mental health through the mediating role of resilience. Even after the introduction of resilience, the direct effect of PA and mental health was still significant, indicating that resilience plays a partially mediating role, with the mediating effects accounting for 40 and 29%,

TABLE 3 Physical activity, resilience, and mental health correlation matrix.

Variable	PA_1	Re_1	PA_2	Re_2
Re_1	0.263	1		
PI	0.27	0.453		
Re_2			0.273	1
NI			−0.256	−0.319

PA_1 is a PA that impacts positive indicators of mental health; Re_1 is resilience that impacts positive indicators of mental health; PA_2 is a PA that impacts negative indicators of mental health; Re_2 is resilience that impacts negative indicators of mental health; PI is positive indicators of mental health; NI is negative indicators of mental health.

TABLE 4 Path analysis of the mediating effect of resilience.

Mediating variable	*k*	*a*	CI_a	*b*	CI_b	*ab*	CI_{ab}	*c*	CI_c	*d*
PA-Re-PI	8	0.263	0.216, 0.313	0.411	0.316, 0.506	0.108	0.080, 0.141	0.161	0.040, 0.283	0.269
PA-Re-NI	7	0.273	0.183, 0.361	−0.270	−0.319, −0.221	−0.074	−0.100, −0.051	−0.182	−0.275, −0.089	−0.256

k is the number of studies; PA is PA; Re is resilience; PI is positive indicators of mental health; NI is negative indicators of mental health; *a* is the effect of the predictor variable (PA) on the mediator variable (Re); *b* is the effect of the mediator variable (Re) on the outcome variables (PI, NI); *ab*: the indirect effect of the predictor variable on the outcome variable through the mediator variable; *c*: the direct effect of the predictor variable on the outcome variable; *d*: the total effect of the predictor variable on the outcome variable.

respectively. Our study revealed that resilience had a stronger mediating influence on positive mental health measures than negative ones. This implies that positive mental health outcomes may favor a person's trait resilience (28) and can further increase the weight of resilience in the system of PA-mental health relationships. Resilience shields individuals from the consequences of difficult circumstances by following four primary potential routes: diminishing the likelihood of being affected, mitigating adverse ripple effects, bolstering psychosocial abilities like self-esteem and self-efficacy, and providing chances for adaptive responses (64). Therefore, consistently engaging in PA can indirectly improve mental health by bolstering psychological resilience and boosting an individual's self-esteem and self-efficacy.

5 Limitations and future directions

In order to validate the mediating effect of resilience, it was necessary to include three variable indicators: PA, mental health, and resilience. Nevertheless, this reduced the sample size, which may have affected the accuracy of the effect values associated with PA and mental health.

The included studies had significant variation and were restricted in number. This study did not examine the moderating effects of characteristics such as subject age, gender, and type of measurement instrument. Therefore, further research is required in the future.

From the perspective of the research subjects included in the study, there are very few relevant studies on older adults. As China, a densely populated nation, experiences an aging population, it becomes imperative to allocate more focus and study toward the mental well-being of the older adults.

China has been the fastest-growing country in the world in the past two decades. The lack of physical activity of people caused by informatization and intelligence has become a major cause of non-communicable diseases, including mental health problems. Hence, there is an urgent need to focus on studies related to physical inactivity in the future.

6 Conclusion

This study was the first to explore the relationship between PA, resilience, and mental health using the MASEM approach. Our findings suggested that PA is positively correlated with positive indicators of mental health and negatively correlated with negative indicators of mental health. Moreover, PA can positively influence mental health through the mediating role of resilience.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

HL: Data curation, Methodology, Writing – original draft, Writing – review & editing. YZ: Data curation, Writing – original draft. QL: Supervision, Writing – review & editing. SL: Data curation, Methodology, Writing – original draft.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Acknowledgments

We appreciate the linguistic assistance provided by ZYEdit during the preparation of this manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2024.1434624/full#supplementary-material

References

1. Greenspoon PJ, Saklofske DH. Toward an integration of subjective well-being and psychopathology. *Soc Indic Res*. (2001) 54:81–108. doi: 10.1023/A:1007219227883

2. Suldo SM, Shaffer EJ. Looking beyond psychopathology: the dual-factor model of mental health in youth. *School Psychol Rev*. (2008) 37:52–68. doi: 10.1080/02796015.2008.12087908

3. Keyes CL. The mental health continuum: from languishing to flourishing in life. *J Health Soc Behav*. (2002) 43:207–22. doi: 10.2307/3090197

4. Lukat J, Margraf J, Lutz R, van der Veld WM, Becker ES. Psychometric properties of the positive mental health scale (pmh-scale). *BMC Psychol*. (2016) 4:1–14. doi: 10.1186/s40359-016-0111-x

5. Topp CW, Østergaard SD, Søndergaard S, Bech P. The who-5 well-being index: a systematic review of the literature. *Psychother Psychosom*. (2015) 84:167–76. doi: 10.1159/000376585

6. Chassany O, Dimenäs E, Dubois D, Wu A, Dupuy H. The psychological general well-being index (pgwbi) user manual. Lyon, France: Mapi Research Institute (2004).

7. Zhang X, He G, Zheng X. Adolescent students' life satisfaction: its construct and scale development. *J Psychol Sci*. (2004) 27:1257–60. doi: 10.16719/j.cnki.1671-6981.2004.05.068

8. Radloff LS. The ces-d scale: a self-report depression scale for research in the general population. *Appl Psych Meas*. (1977) 1:385–401. doi: 10.1177/014662167700100306

9. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the depression anxiety stress scales (dass) with the beck depression and anxiety inventories. *Behav Res Ther*. (1995) 33:335–43. doi: 10.1016/0005-7967(94)00075-u

10. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the gad-7. *Arch Intern Med*. (2006) 166:1092–7. doi: 10.1001/archinte.166.10.1092

11. Smith RE, Smoll FL, Cumming SP, Grossbard JR. Measurement of multidimensional sport performance anxiety in children and adults: the sport anxiety scale-2. *J Sport Exerc Psychol*. (2006) 28:479–501. doi: 10.1123/jsep.28.4.479

12. Schuch FB, Vancampfort D, Richards J, Rosenbaum S, Ward PB, Stubbs B. Exercise as a treatment for depression: a meta-analysis adjusting for publication bias. *J Psychiatr Res*. (2016) 77:42–51. doi: 10.1016/j.jpsychires.2016.02.023

13. Mutrie N. The relationship between physical activity and clinically defined depression In: Biddle SJH, Fox KR, Boucher SH, editors. Physical activity and psychological well-being. London: Routledge (2000). 46–62.

14. Lin Y, Gao W. The effects of physical exercise on anxiety symptoms of college students: a meta-analysis. *Front Psychol*. (2023) 14:1136900. doi: 10.3389/fpsyg.2023.1136900

15. Carter T, Pascoe M, Bastounis A, Morres ID, Callaghan P, Parker AG. The effect of physical activity on anxiety in children and young people: a systematic review and meta-analysis. *J Affect Disorders*. (2021) 285:10–21. doi: 10.1016/j.jad.2021.02.026

16. Chi X, Liang K, Chen S, Huang Q, Huang L, Yu Q, et al. Mental health problems among Chinese adolescents during the COVID-19: the importance of nutrition and physical activity. *Int J Clin Health Psychol*. (2021) 21:100218. doi: 10.1016/j.ijchp.2020.100218

17. Ellis WE, Dumas TM, Forbes LM. Physically isolated but socially connected: psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Can J Behav Sci*. (2020) 52:177–87. doi: 10.1037/cbs0000215

18. Alves JM, Yunker AG, Defendis A, Xiang AH, Page KA. Bmi status and associations between affect, physical activity and anxiety among us children during COVID-19. *Pediatr Obes*. (2021) 16:e12786. doi: 10.1111/ijpo.12786

19. Stonerock GL, Hoffman BM, Smith PJ, Blumenthal JA. Exercise as treatment for anxiety: systematic review and analysis. *Ann Behav Med*. (2015) 49:542–56. doi: 10.1007/s12160-014-9685-9

20. Li B, Ng K, Tong X, Zhou X, Ye J, Yu JJ. Physical activity and mental health in children and youth during COVID-19: a systematic review and meta-analysis. *Child Adolesc Psychiatry Ment Health*. (2023) 17:92. doi: 10.1186/s13034-023-00629-4

21. Qiao Y, Fan Y. Interrogation and response: eight basic problems in the study of the relationship between physical activity and happiness. *J Shanghai Univ Sport*. (2020) 44:1–15. doi: 10.16099/j.sus.2020.07.001

22. Stephens T. Physical activity and mental health in the unitedstates and Canada: evidence from four population surveys. *Prev Med*. (1988) 17:35–47. doi: 10.1016/0091-7435(88)90070-9

23. Biddle SJ. Emotion, mood and physical activity In: Biddle S, Fox K, Boucher S, editors. Physical activity and psychological well-being. London: Routledge (2000). 63–87.

24. Hearon BA, Quatromoni PA, Mascoop JL, Otto MW. The role of anxiety sensitivity in daily physical activity and eating behavior. *Eat Behav*. (2014) 15:255–8. doi: 10.1016/j.eatbeh.2014.03.007

25. Luo S, Mei Z, Fang G, Mu G, Zhang X, Luo S. Effects of mind–body therapies on depression among adolescents: a systematic review and network meta-analysis. *Front Public Health*. (2024) 12:1431062. doi: 10.3389/fpubh.2024.1431062

26. Dewolfe CE, Galbraith MK, Smith MM, Watt MC, Olthuis JV, Sherry SB, et al. Anxiety sensitivity and physical activity are inversely related: a meta-analytic review. *Ment Health Phys Act*. (2023) 25:100548. doi: 10.1016/j.mhpa.2023.100548

27. White RL, Babic MJ, Parker PD, Lubans DR, Astell-Burt T, Lonsdale C. Domain-specific physical activity and mental health: a meta-analysis. *Am J Prev Med*. (2017) 52:653–66. doi: 10.1016/j.amepre.2016.12.008

28. Hu TQ, Zhang DJ, Wang JL. A meta-analysis of the trait resilience and mental health. *Pers Indiv Differ*. (2015) 76:18–27. doi: 10.1016/j.paid.2014.11.039

29. Davydov DM, Stewart R, Ritchie K, Chaudieu I. Resilience and mental health. *Clin Psychol Rev*. (2010) 30:479–95. doi: 10.1016/j.cpr.2010.03.003

30. Liu R, Menhas R, Saqib ZA. Does physical activity influence health behavior, mental health, and psychological resilience under the moderating role of quality of life? *Front Psychol*. (2024) 15:1349880. doi: 10.3389/fpsyg.2024.1349880

31. Brito CJ, Dos Santos Chagas AL, de Brito MA, Müller VT, Noronha AS, Coswig V, et al. Testes de resistência mental e aptidão física de atletas de boxe associados aos cinco grandes fatores de personalidade. *Revista Brasileira de Cineantropometria e Desempenho Humano*. (2023) 25:e87135. doi: 10.1590/1980-0037.2023v25e87135

32. San Román-Mata S, Puertas-Molero P, Ubago-Jiménez JL, González-Valero G. Benefits of physical activity and its associations with resilience, emotional intelligence, and psychological distress in university students from southern Spain. *Int J Environ Res Public Health*. (2020) 17:4474. doi: 10.3390/ijerph17124474

33. Fan X, Menhas R, Laar RA. Repercussions of pandemic and preventive measures on general well-being, psychological health, physical fitness, and health behavior: mediating role of coping behavior. *Psychol Res Behav Manag*. (2023) 16:2437–54. doi: 10.2147/PRBM.S405273

34. Lin H, Wang B, Hu Y, Song X, Zhang D. Physical activity and interpersonal adaptation in Chinese adolescents after COVID-19: the mediating roles of self-esteem and psychological resilience. *Psychol Rep*. (2024) 127:1156–74. doi: 10.1177/00332941221137233

35. Abolghasemi A, Varaniyab ST. Resilience and perceived stress: predictors of life satisfaction in the students of success and failure. *Procedia Soc Behav Sci*. (2010) 5:748–52. doi: 10.1016/j.sbspro.2010.07.178

36. Abiola T, Udofia O. Psychometric assessment of the Wagnild and Young's resilience scale in Kano, Nigeria. *BMC Res Notes*. (2011) 4:1–5. doi: 10.1186/1756-0500-4-509

37. Burns RA, Anstey KJ. The Connor–Davidson resilience scale (cd-risc): testing the invariance of a uni-dimensional resilience measure that is independent of positive and negative affect. *Pers Indiv Differ*. (2010) 48:527–31. doi: 10.1016/j.paid.2009.11.026

38. Rossi NE, Bisconti TL, Bergeman CS. The role of dispositional resilience in regaining life satisfaction after the loss of a spouse. *Death Stud*. (2007) 31:863–83. doi: 10.1080/07481180701603246

39. Ying L, Wu X, Lin C, Jiang L. Traumatic severity and trait resilience as predictors of posttraumatic stress disorder and depressive symptoms among adolescent survivors of the Wenchuan earthquake. *PLoS One*. (2014) 9:e89401. doi: 10.1371/journal.pone.0089401

40. Beutel ME, Glaesmer H, Wiltink J, Marian H, Brähler E. Life satisfaction, anxiety, depression and resilience across the life span of men. *Aging Male*. (2010) 13:32–9. doi: 10.3109/13685530903296698

41. Liu Z. Effects of physical exercise on negative emotion for university students——the mediating and moderating effects of self-efficacy and mental resilience. *J Phys Educ Recreat Dance*. (2020) 27:102–8. doi: 10.16237/j.cnki.cn44-1404/g8.2020.05.014

42. Zhou H, Zhou Q. Effect of physical exercise on subjective well-being of college students: chain mediation effect of cognitive reappraisal and resilience. *J Shandong Sport Univ*. (2022) 38:105–11. doi: 10.14104/j.cnki.1006-2076.2022.01.013

43. Li HY, Yan J, Shen B, Chen AG, Huang CH. Effect of extracurricular physical exercise on life satisfaction of upper elementary students: the chain mediating role of self-confidence and resilience. *China Sport Sci Technol*. (2022) 58:51–6. doi: 10.16470/j.csst.2021148

44. Hunter JE, Schmidt FL. Dichotomization of continuous variables: the implications for meta-analysis. *J Appl Psychol*. (1990) 75:334–49. doi: 10.1037/0021-9010.75.3.334

45. Orwin RG. A fail-safe n for effect size in meta-analysis. *J Educ Stat*. (1983) 8:157–9. doi: 10.2307/1164923

46. Duval S, Tweedie R. Trim and fill: a simple funnel-plot–based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*. (2000) 56:455–63. doi: 10.1111/j.0006-341X.2000.00455.x

47. Jak S, Cheung MW. Meta-analytic structural equation modeling with moderating effects on sem parameters. *Psychol Methods*. (2020) 25:430–55. doi: 10.1037/met0000245

48. Cohen J. A power primer. *Psychol Bull*. (1992) 112:155–9. doi: 10.1037//0033-2909.112.1.155

49. Mckinney J, Lithwick DJ, Morrison BN, Nazzari H, Isserow SH, Heilbron B, et al. The health benefits of physical activity and cardiorespiratory fitness. *B C Med J*. (2016) 58:131–7.

50. Habibzadeh N. The physiological impact of physical activity on psychological stress. *Prog Health Sci*. (2015) 5:245–8.

51. Kringelbach ML, Berridge KC. Towards a functional neuroanatomy of pleasure and happiness. *Trends Cogn Sci*. (2009) 13:479–87. doi: 10.1016/j.tics.2009.08.006

52. Kong F, Hu S, Wang X, Song Y, Liu J. Neural correlates of the happy life: the amplitude of spontaneous low frequency fluctuations predicts subjective well-being. *NeuroImage*. (2015) 107:136–45. doi: 10.1016/j.neuroimage.2014.11.033

53. Taylor SE, Stanton AL. Coping resources, coping processes, and mental health. *Annu Rev Clin Psychol*. (2007) 3:377–401. doi: 10.1146/annurev.clinpsy.3.022806.091520

54. Rodgers JL, Jones J, Bolleddu SI, Vanthenapalli S, Rodgers LE, Shah K, et al. Cardiovascular risks associated with gender and aging. *J Cardiovasc Dev Dis*. (2019) 6:19. doi: 10.3390/jcdd6020019

55. Cheng YJ, Macera CA, Addy CL, Sy FS, Wieland D, Blair SN. Effects of physical activity on exercise tests and respiratory function. *Br J Sport Med*. (2003) 37:521–8. doi: 10.1136/bjsm.37.6.521

56. Menhas R, Dai J, Ashraf MA, M Noman S, Khurshid S, Mahmood S, et al. Physical inactivity, non-communicable diseases and national fitness plan of China for physical activity. *Risk Manag Healthc Policy*. (2021) 14:2319–31. doi: 10.2147/RMHP.S258660

57. Dray J, Bowman J, Campbell E, Freund M, Wolfenden L, Hodder RK, et al. Systematic review of universal resilience-focused interventions targeting child and adolescent mental health in the school setting. *J Am Acad Child Adolesc Psychiatry*. (2017) 56:813–24. doi: 10.1016/j.jaac.2017.07.780

58. Vos LM, Habibović M, Nyklíček I, Smeets T, Mertens G. Optimism, mindfulness, and resilience as potential protective factors for the mental health consequences of fear of the coronavirus. *Psychiatry Res*. (2021) 300:113927. doi: 10.1016/j.psychres.2021.113927

59. Ozkara AB, Kalkavan A, Alemdag S, Alemdag C. The role of physical activity in psychological resilience. *Baltic J Sport Health Sci*. (2016) 3:24–9. doi: 10.33607/bjshs.v3i102.62

60. Liang J, Zhang S, Wu Z. Relationship among social anxiety, emotional maltreatment and resilience in rural college students with left-behind experience. *Chin Ment Health J*. (2019) 33:64–9. doi: 10.3969/j.issn.1000-6729.2019.01.012

61. Yang J, Ren YJ, Li YM, Tang SY. The influence of physical exercise on the spiritual well-being of the elderly: the mediator role of psychological resilience. *Chin J Clin Psych*. (2021) 191-4:208. doi: 10.16128/j.cnki.1005-3611.2021.01.039

62. Davis CL, Tomporowski PD, Mcdowell JE, Austin BP, Miller PH, Yanasak NE, et al. Exercise improves executive function and achievement and alters brain activation in overweight children: a randomized, controlled trial. *Health Psychol*. (2011) 30:91–8. doi: 10.1037/a0021766

63. Cioffi J, Schmied V, Dahlen H, Mills A, Thornton C, Duff M, et al. Physical activity in pregnancy: women's perceptions, practices, and influencing factors. *J Midwifery Womens Health*. (2010) 55:455–61. doi: 10.1016/J.JMWH.2009.12.003

64. Rutter M. Resilience in the face of adversity: protective factors and resistance to psychiatric disorder. *Br J Psychiatry*. (1985) 147:598–611. doi: 10.1192/bjp.147.6.598

65. Cocozza S, Sacco PL, Matarese G, Maffulli GD, Maffulli N, Tramontano D. Participation to leisure activities and well-being in a group of residents of Naples-Italy: the role of resilience. *Int J Env Res Pub He*. (2020) 17:1895. doi: 10.3390/ijerph17061895

66. Cui GQ, Zhang LL. The influence of physical exercise on college students' negative emotions: the mediating and regulating role of psychological resilience. *Rev Psicol Deporte*. (2022) 31:21–8.

67. Ho F, Louie L, Chow CB, Wong W, Ip P. Physical activity improves mental health through resilience in Hong Kong Chinese adolescents. *BMC Pediatr*. (2015) 15:1–9. doi: 10.1186/s12887-015-0365-0

68. Li XN, Yu HS, Yang N. The mediating role of resilience in the effects of physical exercise on college students' negative emotions during the COVID-19 epidemic. *Sci Rep UK*. (2021) 11:24510. doi: 10.1038/s41598-021-04336-y

69. Wu K, Wang SN, Ding TY, Li YX. The direct effect of exercise on the mental health of scientific and technological professionals and the mediating effects of stress, resilience, and social support. *Front Public Health*. (2023) 11:1074418. doi: 10.3389/fpubh.2023.1074418

70. Wu RS, Jing LJ, Liu Y, Wang HL, Yang JY. Effects of physical activity on regulatory emotional self-efficacy, resilience, and emotional intelligence of nurses during the COVID-19 pandemic. *Front Psychol*. (2022) 13:1059786. doi: 10.3389/fpsyg.2022.1059786

71. Xin S, Ma X. Mechanisms of physical exercise effects on anxiety in older adults during the COVID-19 lockdown: an analysis of the mediating role of psychological resilience and the moderating role of media exposure. *Int J Environ Res Public Health*. (2023) 20:3588. doi: 10.3390/ijerph20043588

72. Xu H, Yin F, Yang S, Ji Y, Yao Q, Zhang Y, et al. Physical exercise impact on the life satisfaction among rural adolescents in Zizhong county. *J Hygiene Res*. (2018) 47:936–41. doi: 10.19813/j.cnki.weishengyanjiu.2018.06.015

73. Zhang M, Xu X, Jiang J, Ji Y, Yang R, Liu Q, et al. The association between physical activity and subjective well-being among adolescents in Southwest China by parental absence: a moderated mediation model. *BMC Psychiatry*. (2023) 23:493. doi: 10.1186/s12888-023-04982-8

74. Zhang W. Mediating effect of resilience on relationship between exercise and depression in elderly. *J Guangzhou Sport Univ*. (2018) 38:99–102. doi: 10.13830/j.cnki.cn44-1129/g8.2018.05.027

75. Zhang ZH, Wang T, Kuang J, Herold F, Ludyga S, Li JM, et al. The roles of exercise tolerance and resilience in the effect of physical activity on emotional states among college students. *Int J Clin Health Psychol*. (2022) 22:100312. doi: 10.1016/j.ijchp.2022.100312

frontiers | Frontiers in Psychiatry

TYPE Opinion
PUBLISHED 04 November 2024
DOI 10.3389/fpsyt.2024.1440113

OPEN ACCESS

EDITED BY
Lirong Wang,
University of Pittsburgh, United States

REVIEWED BY
Oshin Miranda,
University of Pittsburgh, United States

*CORRESPONDENCE
Edmund Howe
Edmund.howe@usuhs.edu

RECEIVED 29 May 2024
ACCEPTED 05 August 2024
PUBLISHED 04 November 2024

CITATION
Howe E (2024) A new psychotherapy that may treat PTSD in one session. *Front. Psychiatry* 15:1440113. doi: 10.3389/fpsyt.2024.1440113

A new psychotherapy that may treat PTSD in one session

Edmund Howe*

School of Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD, United States

KEYWORDS

PTSD, brief, psychotherapy, new, anxiety, The Cortina Method, TCM

Introduction

Patients who have post-traumatic stress disorder (PTSD) may not respond completely to standard treatments. As one text states, "Current therapeutic regimens are effective in a majority of patients, but many individuals continue to have persistent symptoms of PTSD despite conventional treatment" (1, 2). Thus, new approaches that can help these patients do better are needed. Accelerated resolution therapy (ART) and psychedelics with psychotherapy are relatively new therapies that are responsive to this need (3, 4). There is now also another psychotherapeutic approach that may be added to this list. It is based on the suggestion of New York University neuroscientists led by Daniela Schiller in *Nature* in 1910 that people's fearful memories could be erased (5). This therapy is called The Cortina Method or TCM, named after Michael Cortina, who developed it.

This new approach to patients who have painful memories may be profoundly effective in some cases and is briefer than other interventions. As NBC has reported this and as is presented in this therapy's website, just one visit is often enough to eliminate the crippling affect patients may have after trauma even when it has been present for decades. This relief may therefore wholly alter these patients' lives. In light of this success, Cortina's therapy has now been reported in over 400 press and media US outlets. Testimonials of both patients and therapists can be reviewed at MichaelCortina.com (accessed 27 May 2024). This opinion piece will present an overview of this therapy.

Core merits of TCM

The core benefit from TCM likely involves memory reconsolidation. Memories previously stored may be rebuilt each time a memory is recalled, and as a result of this rebuilding, the affect associated with painful memories may be altered (6, 7). TCM, though, does not require patients to recall or recite their past trauma in detail. This benefit is potentially most important because, otherwise, patients may not initially seek out or may not later continue other PTSD therapies that could be beneficial, because they may find their reciting past details of their traumas too painful. As of now, this therapy has not shown any downsides, though in the future, follow-up studies may reveal these.

Patients responding have had the most painful emotions and tragic past traumas, yet after just one session, they have experienced relief. These traumas have included, for example, veterans who have had beloved service members blown up by an explosive device right next to them, patients who have had family members killed in a car accident while with them, and

patients who have been gang-raped and even tortured. The gains from this therapy, it appears, too, may generalize. After experiencing this therapy, patients have reported relief of anxiety associated with other past traumas they have experienced. These findings have been recorded in video recordings that show these results from start to finish.

Peer-reviewed, double-blind research comparing TCM head to head with other, current standard therapies has not been done though. Long-term results have also not been obtained. Researchers interested in conducting these studies could, it would seem, readily conduct these studies. With the positive results obtained thus far and the absence of reported harmful side effects, though all this is only anecdotal, Institutional Review Boards likely would be prone to accepting pilot studies that are proposed.

Patients coming for treatment as shown in video recordings by therapists who have treated them often initially feel hopeless due to their anxiety having destroyed their quality of life for years when prior help has not succeeded. They have sometimes seen several past therapists without success. Since these dire beginnings and subsequent positive results are documented in numerous video recordings and reported by now large numbers of patients and therapists, in this piece, I will bring basic information regarding TCM to the attention of therapists and others.

Examples of testimonials

Personal reports of patients and therapists are presently immediately available on the above TCM website. One patient exclaims there, for instance, "Unbelievable, incredibly life-changing for me! For 40 years I carried the past around as part of my identity, it's not me anymore! Thank you!" Another says, "This session was more helpful than 20 years of therapy. It's a miracle." A therapist calls this therapy "truly life-changing." Another therapist says that this method has "revolutionized how we deliver care for acute and complex trauma. The results are fast, lasting and transforming."

Some of the therapists I talked to at the training session I attended were initially, themselves, patients. They had PTSD, learned of TCM, and then sought it out. After they regained their quality of life, some of these therapists, they told me, then, sought out TCM training to be able to offer it to their patients. Some therapists at this same training session I attended were returning for additional training. They sought to hone the skills they had learned only initially, since acquiring TCM skills is, as the case with most therapies, an asymptotic endeavor.

In TCM, Cortina has provided a panoply of interventions that he has integrated into a series of step-by-step measures that build upon each other. Counterintuitively, at least for me, therapists having attended even just one first training session may gain results close to those that Cortina himself achieved. The successes they may achieve, unprecedented in their practices, often surprise even them. This may occur because these interventions may be effective even when they are performed sub-optimally. Even when they use only some, these therapists report, these alone may still achieve for patients the results they have sought.

These interventions that Cortina both uses and teaches vary widely. They involve moving patients to use their visual imagination, enact bodily activities, change their cognitive frameworks, and engage in other activities unknown in other therapies. These last interventions may, for instance, require patients to do multiple tasks at the same time and respond in repetitive actions that have no conceptual meaning. All these interventions may have in common the potential and likelihood of enabling patients' brains to become more open to change. The mechanisms of the gains from these procedures taken separately or together are not known and are, at best, speculative.

The origin of TCM

How Cortina came to develop TCM may help explain this. He, as a social worker, had given patients state-of-the-art therapy but found this to be frustrating because, all too often, it was insufficiently effective. Consequently, he sought out from the medical literature all interventions that showed unequivocal evidence of therapeutic efficacy. He sought to maximize measures possible due to the plasticity of our brains. This therapy may also be effective because, in addition, it includes suggestions as used and taught early on by the psychiatrist Milton Erickson. He was known for his exceptional success in treating patients with whom other therapists had failed. Therapists continue to meet yearly to learn how to use and build upon his work until today (https://www.erickson-foundation.org/the-collected-works) (twelve volumes, accessed 19 March 2024).Erickson is seen and called by some as the father of indirect hypnosis. He would most often only talk with patients conversationally. His patients, like Cortina's, come to feel safe and relaxed and, in this more suggestible state, are especially responsive to the suggestion that they can change. I studied with Erickson early on in my career and learned more about this means of helping patients from a colleague and psychologist, Harold Wain. He is an expert on hypnosis and at one time, for medical reasons, without using any anesthesia, talked a patient through surgery using only hypnosis. He has written this up and recorded this on film that I have seen (8). Cortina having also become aware of this intervention's potential also then sought to use it.

Patients with PTSD have been shown to have higher levels of common cytokines. Evidence suggests that dysregulation of the mechanisms that regulate the HPA system results in lower levels of cortisol, and these lower levels can contribute to this chronic low-grade inflammatory state, and this inflammation may then drive symptoms of PTSD (9). It is unlikely that a single mechanism can explain how hypnosis may help some patients with PTSD overcome this. Hypnosis affects many parts of the brain differently, and its neural mechanisms are not at this time well understood (10).

Discussion

I initially came to know of TCM through a colleague who contacted me, raving at how singularly successful she and others had found it to be. She, like me, had studied ART before this and found TCM to be even more rapid and effective. I went, then, myself, to a training session, as I had before to learn ART. I recall, to provide an example of ART for comparison, a patient who responded well to ART. She had repeatedly been sexually abused by an older person as a teen. She in her

imagination using ART saw in her mind this abusing person decomposing into the dirt beneath her. This fertilized the soil, resulting in its growing beautiful flowers. She then saw herself giving these flowers to children who, upon receiving them, shrieked with delight.

TCM may equal or even surpass ART in its efficacy as my colleague believed, though, as I repeat, this has not been empirically studied and shown. TCM may most reflect and be seen as having built upon the views of Bessel Van Der Kolk as related in his book, *The Body Keeps the Score* (11). Passages in this work suggest the principles Cortina has adopted. I will include a few of these similarities here. Van Der Kolk reports, for example, how one patient feared that his approach was "some new age gimmick" (11, at 296). Some people, likewise, have thought this too when they have first heard from others examples of TCM's most marked successes.

As a second example, Van Der Kolk relates the experience of a veteran who had unbearable nightmares. He saw in his dreams, for instance, Vietnamese children who had died. He reports in regard to this patient that trauma during war may not be treatable only with words. Cortina, in sync with this, uses visual, body, and other measures, also seeking to effect change by these additional means.

Van Der Kolk also cites the United States World Trade Center disaster as an example of how profoundly visual images may affect us. We may play sights of such disasters, he says, "over and over" in our minds (11, at 233). Seeing an event like this, he says, disrupts our brain's networks of communications. Cortina, likewise, again, seeks to restore to patients the healthy brain circuits they had prior to their trauma.

Van Der Kolk finally summarizes the therapeutic ends he believes therapists should strive for. The sensory feelings of being seen, cradled, and supported, he says, can serve as antidotes to static, frozen feelings produced by prior trauma. They then can contradict these frozen feelings, replacing them with sensations rooted in "safety, mastery, delight and connection" (9, at 310). This could be seen as Cortina's ultimate mantra just as well. His basic presupposition also mirrors Milton Erickson's, that "people already have the resources they need to effect change" (12). Therapists, as others, may quite rightly question whether patients who have experienced life-shattering trauma can again ever escape life-deadening PTSD symptoms. They reasonably may doubt whether any therapy exists that can provide them relief. They may, after experiencing TCM, be without, however, their previously even unbearable anxiety.

TCM may restore meaningful life to patients who previously have given up hope and concluded that, for them at least, getting better will never be possible. One authority says that "New advances in the neurobiology of fear memory promise novel approaches to PTSD treatment, including the erasure of traumatic memories" (13). Still, of course, experts most appropriately urge caution. They say, for example, "Caution is required when inferring reconsolidation from behavioral results and when using reconsolidation theory to predict and account for such data" (14–17). Therapists seeking TCM training can pursue this through the above TCM website. Those wanting simply to become acquainted with this therapy may find that by just viewing this website, this will provide for them the information they want.

These patients' and therapists' testimonials particularly illustrate the profundity of the changes our brains' plasticity may possibly make. For me, my merely becoming aware of even just these relatively few patients' success has informed me of how much change is possible after only a brief therapy. Patients' lives can be destroyed by trauma. Yet, they may have the potential, even then, to get better. I would not have, prior to coming to know of TCM, fully imagined this.

Table 1 compares and contrasts TCM with exposure therapy, which is widely recognized as a standard of treatment for PTSD. This table was prepared by Michael Cortina.

TABLE 1 Comparison of exposure therapy and The Cortina Method (TCM).

Exposure Therapy	The Cortina Method (TCM)
Client is exposed to feared stimulus.	Exposure to feared stimulus not required.
Client relives pain.	Guest (client) does not have to relive any pain.
Requires 3 months of treatment with weekly sessions of 60–120 min; 8–15 sessions overall.	Requires one to two visits of 60–110 min.
Very anxiety-provoking for clients.	Guests report TCM being light, relaxing, even laughed and enjoyed the process.
Can be traumatic and make symptoms worse.	Worst-case scenario is it does not work. Nobody has gotten worse.
Can have high rate of dropout from treatment.	Zero to minimal dropout rate due to the efficiency of the treatment and the gentle, uplifting process of the treatment.
Effectiveness rate of 53%–80%.	Effectiveness rate of 90%.

Author contributions

EH: Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Author disclaimer

The opinions and assertions expressed herein are those of the author and do not reflect the official policy or position of the Uniformed Services University of the Health Sciences or the Department of Defense. Neither I nor my family members have a financial interest in any commercial product, service, or organization providing financial support for this research. References to non-federal entities or products do not constitute or imply a Department of Defense or Uniformed Services University of the Health Sciences endorsement. This work was prepared by a civilian employee of the US Government as part of the individual's official duties and therefore is in the public domain and does not possess copyright protection (public domain information may be freely distributed and copied); however, as a courtesy, it is requested that the Uniformed Services University and the author be given an appropriate acknowledgment.

References

1. Benedek DM, Wynn GH. *Clinical Manuel for Management of PTSD*. Washington, DC: American Psychiatric Publishing (2011). p. 247.

2. Hoge CW, Chard KM, Yehuda R. US Veterans Affairs and Department of Defense 2023 clinical guideline for PTSD—devolving not evolving. *JAMA Psychiatry*. (2024) 81:223–4. doi: 10.1038/s41380-024-02453-4

3. Howe EG, Rosenzweig L, Shuman A. Ethical reflections on offering patients accelerated resolution therapy (ART). *Innov Clin Neurosci.* (2018) 15:32–4.

4. Hoene S, Wolfgang A, Nissan D, Howe E. Ethical considerations for psychedelic-assisted therapy in military clinical settings. *J Med Ethics*. (2023) 50:jme–2023-108943. doi: 10.1136/jme-2023-108943

5. Lametti D. How to erase fear – in humans(2010). Available online at: https://www.scientificamerican.com/article/how-to-erase-fear-in-humans/ (Accessed 3/22/2024).

6. Nader K, Hardt O. A single standard for memory: the case for reconsolidation. *Nat Rev Neurosci*. (2009) 10:224–34. doi: 10.1038/nrn2590

7. Beckers T, Kindt M. Memory reconsolidation interference as an emerging treatment for emotional disorders: strengths, limitations, challenges, and opportunities. *Annu Rev Clin Psychol*. (2017) 13:99–121. doi: 10.1146/annurev-clinpsy-032816-045209

8. Wain HJ. Reflections on hypnotizability and its impact on ssuccessful surgical hypnosis: A sole anesthetic for septoplasty. *Am J Clin Hypn*. (2004) 46:313–21. doi: 10.1080/00029157.2004.10403615

9. Quinones MM, Gallegos AM, Lin FV, Heffner K. Dysregulation of inflammation, neurobiology, and cognitive function in PTSD: an integrative review. *Cognit Affect Behav Neurosci*. (2020) 20:455–80. doi: 10.3758/s13415-020-00782-9

10. De Pascalis V. Brain functional correlates of resting hypnosis and hypnotizability: a review. *Brain Sci*. (2024) 14:115. doi: 10.3390/brainsci14020115

11. Van Der Kolk B. *The Body Keeps the Score*. New York, N.Y: Penguin Books (1915).

12. Zeig JK. *Experiencing Erickson/An Introduction to the Man and His Work*. New York, N.Y: Brunner/Mazel, Inc. (1985). p. 6.M.

13. Maren SA. *Can Traumatic Memories Be Erased?* (2020). Brain & Behavior. Available online at: https://bbrfoundation.org/event/can-traumatic-memories-be-erased (Accessed 3/22/2024).

14. Schroyens N, Beckers T, Luyten L. Appraising reconsolidation theory and its empirical validation. *Psychon Bull Rev*. (2023) 30:450–63. doi: 10.3758/s13423-022-02173-2

15. Treanor M, Brown LA, Rissman J, Craske MG. Can memories of traumatic experiences or addiction be erased or modified? A critical review of research on the disruption of memory reconsolidation and its applications. *Perspect Psychol Sci*. (2017) 12:290–305. doi: 10.1177/1745691616664725

16. Hori H, Fukushima H, Nagayoshi T, Ishikawa R, Zhuo M, Yoshida F, et al. Fear memory regulation by the cAMP signaling pathway as an index of reexperiencing symptoms in posttraumatic stress disorder. *Mol Psychiatry*. (2024). doi: 10.1038/s41380-024-02453-4

17. Sandkühler J, Lee J. How to erase memory traces of pain and fear. *Trends Neurosci*. (2013) 36:343–52. doi: 10.1016/j.tins.2013.03.004

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 25 November 2024
DOI 10.3389/fpubh.2024.1453830

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Aristea Ilias Ladas,
University of York Europe Campus, Greece
Semra Bulbuloglu,
Istanbul Aydın University, Türkiye

*CORRESPONDENCE
Huixia Cui
✉ 1319447367@qq.com

†These authors have contributed equally to this work and share first authorship

RECEIVED 24 June 2024
ACCEPTED 04 November 2024
PUBLISHED 25 November 2024

CITATION
Ding Z, Fan Y, Zhong G, Zhang X, Li X, Qiao Y and Cui H (2024) A dyadic analysis of family adaptation among breast cancer patients and their spouses based on the framework of family stress coping theory.
Front. Public Health 12:1453830.
doi: 10.3389/fpubh.2024.1453830

A dyadic analysis of family adaptation among breast cancer patients and their spouses based on the framework of family stress coping theory

Zhangyi Ding[1†], Yarong Fan[2†], Gaoxiang Zhong[1], Xinmiao Zhang[1], Xichen Li[1], Yan Qiao[1] and Huixia Cui[3*]

[1]School of Nursing, Jinzhou Medical University, Jinzhou, Liaoning, China, [2]School of Nursing, Shanxi Medical University, Taiyuan, Shanxi, China, [3]School of Nursing, Wannan Medical College, Wuhu, Anhui, China

Background: The active coping strategies of family members can help breast cancer patients better handle the crisis, and family adaptation is a manifestation of the family's active coping with the crisis. In the study of breast cancer, a disease that predominantly affects women, we explored the influence of spouses on patients' family adaptation. This aspect has not been explored in previous studies.

Purpose: In recent years, with the development of family stress coping theory, cancer coping styles have shifted from an individual focus to a whole-family approach. This shift has the potential to help families of cancer patients adapt to the crisis. This study aimed to explore the correlation between dyadic coping, family adaptation, and benefit finding in couples with breast cancer.

Methods: Using convenience sampling, the study included 325 pairs consisting of breast cancer patients and their spouses who attended breast surgery, oncology, and chemotherapy sessions between April and November 2023. The survey utilized the General Information Questionnaire for patients and spouses, the Dyadic Coping Scale, the Benefit Finding Scale, and the Family Adaptability and Cohesion Evaluation Scales. Data analysis was conducted using SPSS 25.0 and Amos 24.0 software.

Results: In the actor effect of dyadic coping on family adaptation, the benefit finding of patients and their spouses played a mediating role. Regarding the partner effect ($B = 0.019$, 95% CI = 0.003–0.045, $P < 0.05$), the dyadic coping of spouses indirectly affected the family adaptation of patients through the benefit findings of patients. The patient's dyadic coping can directly affect the spouse's family adaptation. The spouse's dyadic coping can influence the patient's benefit finding.

Conclusion: There is a partial interaction between breast cancer patients and their spouses' dyadic coping, benefit finding, and family adaptation. Therefore, clinical staff should promptly identify patients and spouses with poor coping abilities and provide them with positive psychological interventions to enhance the dyadic coping abilities of both partners and assist them in overcoming the problems encountered during the treatment process, ultimately helping them better cope with family crises.

KEYWORDS

dyadic coping, family adaptation, benefit finding, family stress coping theory, actor-partner

Introduction

According to the data released by the International Agency for Research on Cancer in 2020, the number of new cancer cases reached 19.3 million worldwide. Notably, breast cancer cases accounted for 2.3 million of these cases, surpassing lung cancer to become the most common cancer globally (1). In 2020, there were an estimated 4.82 million new cancer cases in China. Among these, the number of new cases of female breast cancer reached 357,200, making it the most common cancer among Chinese women after lung, rectal, thyroid, and liver cancers (2).

The diagnosis and treatment of cancer can often be extremely stressful for patients, resulting in severe negative emotions and other adverse consequences (3). More seriously, such stressful events may adversely affect the family adaptation of cancer patients (4). Previous research has shown that couples dealing with illness together can enhance their feelings of closeness and reduce the stress and psychological burden associated with the illness (5). In the face of crisis events, families of cancer patients adopt different coping styles, which may affect the family's adaptation (6).

Family adaptation is the family's direct response to a stressful event, indicating that the family needs to readjust its structure to restore stability and improve overall happiness and satisfaction (7). Studies have shown that stressful events reduce the family's capacity to adapt for both the patient and the primary caregiver (8). In the course of breast cancer treatment, the adaptive capacity of the patient's family is closely related to the caregiver's perceived stress; the higher the perceived level of stress, the worse the adaptive capacity of the family (9). Good family adaptation can reduce the incidence of suicidal ideation in patients (10), and the incidence of anxiety and depression is relatively low in patients with good family adaptation (11).

Benefit finding is a cognitive way of actively coping with adverse external circumstances, manifested as benefits finding from traumatic or unfortunate life events (12). In studies of cancer in men, it has been confirmed that benefit finding is a cognitive strategy to cope with cancer actively; the higher the level of benefit finding, the higher the level of quality of life (13). This cognitive approach not only reduces caregivers' negative emotions, such as anxiety and depression, improves mental health (14), but also improves overall quality of life (15). However, some studies have found that the extent of benefit finding may decrease as the patient's condition worsens (16). A study observed that the level of caregiver benefit findings was strongly correlated with family adaptation (17). In the dyadic study, it was noted that for older patients with physical impairments and their caregivers, low levels of benefit finding may produce mental and emotional distress, which in turn reduces the level of family adaptation (18). Therefore, it is necessary to study further the effect of benefit finding between couples on family adaptation.

In recent years, with the development of the family stress coping theory, the coping style of cancer has shifted from an individual focus to the couple's experience, that is, dyadic coping (19). Research has shown that couples who adopt good dyadic coping strategies can regulate their stress levels more effectively and navigate difficult situations with ease (20). This ability to cope constructively can enhance mutual communication and dependence between couples, foster a more intimate relationship, and improve their ability to resist the illness together (21). Families with better coping styles are more capable of overcoming difficulties and increasing their confidence in dealing with the disease (22). In a dyadic study, it was found that couples facing breast cancer exhibited inefficient coping styles, which not only causes serious psychological distress for both spouses but also may lead to a coping crisis within the family (23). A good dyadic coping style between a husband and wife not only helps effectively manage the disease and overcome the illness but also contributes to a more stable and harmonious family environment (24). Therefore, whether the dyadic coping style between couples has a positive or negative impact on family adaptation needs further research.

Conceptual framework

This study uses the ABC-X theory and the actor–partner interdependence model for analysis. Reuben Hill, founder of family stress theory, proposed the ABC-X stress theory model in 1949 (25). It is a relatively comprehensive family stress theory model. The model contains four factors: A represents the stressor event; B represents the resources to cope with; C represents the cognition or evaluation of the stressful event; and X represents the outcome, that is, the degree of harm caused by the stress or crisis to the individual. In this study, A is a cancer stress event, B is dyadic coping, C is benefit finding, and X is family adaptation. The actor–partner interdependence model (APIM) is a data analysis method proposed by Kenny and Cook in 1999 that allows researchers to analyze how dependent variables are affected by the predictor variables of another party (the partner effect) as well as their predictor (the actor effect) (26). The actor–partner interdependent mediation model (APIMeM) is an APIM-based model proposed by Kenny and Ledermann, which includes mediation variables (27). This model allows estimation of the mediating effects of benefit finding in patient–spouse dyadic relationships (see Figure 1).

Materials and methods

Participants

A cross-sectional survey method was employed in this study. We surveyed breast cancer patients and their spouses who attended breast surgery, radiotherapy, and chemotherapy sessions in three Grade III hospitals in Liaoning Province from April to November 2023 using a convenient sampling method. The inclusion criteria were as follows: (1) age $\geq$ 20 years and married; (2) pathological diagnosis of breast cancer; (3) the patient must be aware of the diagnosis of her disease; (4) the patient must be able to communicate normally and have no diagnosed mental disorder according to *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5). The exclusion criteria were as follows: (1) widowed or divorced status (patient or spouse); (2) have the intention to withdraw from the survey (patient or spouse); and (3) history of mental problems (patient or spouse).

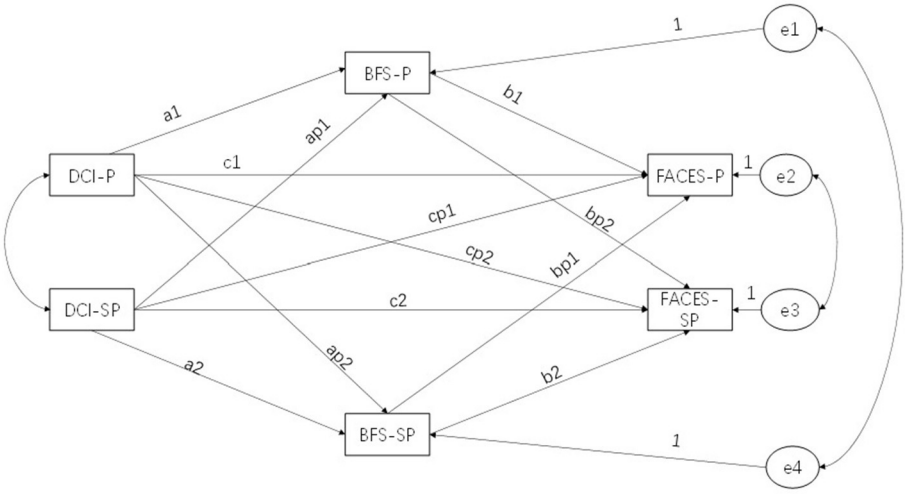


FIGURE 1
Basic model structure. DCI, Dyadic Coping Inventory; BFS, Benefit Finding Scale; FACES, Family Adaptability and Cohesion Evaluation Scales; *P*, patient; SP, spouse.

In this study, Gpower3.1 software was used to calculate the sample size. According to the literature review, α value was set to 0.05, the statistical power (1 – β) to 0.90, and the effect size to 0.25 (28). The calculation showed that a minimum of 275 pairs (including patients and spouses) were required, and we collected 325 valid data pairs (see Figure 2).

Data collection

Before data collection, researchers received uniform training to ensure that the instructions communicated to study subjects remained consistent. The researchers explained the purpose and significance of the study to the subjects and guided them to sign a written informed consent. To ensure data reliability, the subjects were instructed to complete the survey in two different locations and were not allowed to discuss it with one another. At the same time, the researchers made sure to be always available to help study subjects who had difficulty reading, writing, or understanding the survey. Immediately after the survey was completed, the questionnaires were collected and checked to ensure that no missing items were present and that invalid questionnaires were removed. To protect the privacy of research subjects, all information was anonymized. The research followed the ethical principles of the Declaration of Helsinki and was approved by the Ethics Committee of Jinzhou Medical University (approval number: JZMULL2023026).

Measurements

Dyadic coping inventory

DCI was developed by Bodenmann (29) in 2008 to assess how effectively couples cope with stress. In 2016, Chinese scholar Xu et al. (30) translated the DCI scale into Chinese. The scale consists of 37 items divided into five dimensions using a 5-point Likert score with an overall range of 35–175 points. A score below 111 indicates a low level of binary coping, a score between 111 and 145 represents a moderate level, and a score above 145 indicates a high level of binary coping, with a higher score representing a better ability to cope. In this study, the value of Cronbach's α was 0.942 for the patient and 0.916 for the spouse.

Benefit finding scale

BFS was originally compiled by Antoni et al. (31) in 2001 for breast cancer patients. The higher the total score, the greater the level of benefit finding. In this study, the Chinese version of the Benefit Finding Scale adapted by Liu et al. (32) was used to assess the level of benefit finding in breast cancer patients. The scale contains 22 items covering six dimensions and uses a 5-point Likert score, with a higher score indicating greater benefit finding. In this study, the value of Cronbach's α was 0.923 for patients and 0.889 for spouses.

Family Adaptability and Cohesion Evaluation Scales

FACES is the most commonly used family adaptation scale. FACES was developed by Olson et al. (33) in 1979. Chinese scholars translated the FACES scale into Chinese. They revised it to form the Chinese version of the FACES II-CV scale (34), which contains 30 items divided into two subscales: family intimacy and family adaptability. The intimacy subscale includes 16 items, while adaptability contains 14 items, with each item scored on a five-point Likert scale. The content of the family adaptability dimension is more appropriate, as it better reflects the individual's satisfaction with family adaptation. In this study, the value of Cronbach's α was 0.957 for the patient and 0.965 for the spouse.

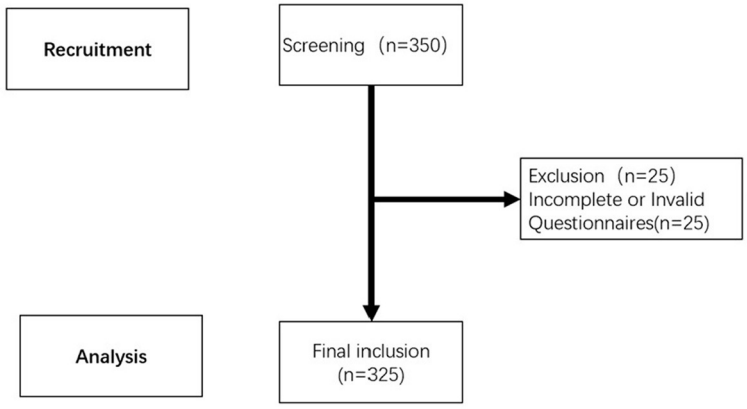


FIGURE 2
Flow diagram of study participants.

Sociodemographic and clinical characteristics

The demographic information of patients and spouses was collected using self-made questionnaires. At the same time, clinical characteristics of patients and their spouses were obtained through medical record review. All the contents of our investigation were approved by the patients and patients provided their informed consent.

Quality assurance

Under the tutor's guidance, we edited and standardized the questionnaire and two members of the research team were selected to administer the questionnaire. The study group members distributed questionnaires to protect patients' privacy and encourage their active participation. The responses were put through a double-input and verified using Excel software to ensure the effectiveness and accuracy of the questionnaire.

Statistical analysis

Descriptive statistical methods, including frequency distribution, mean, and standard deviation, were used to summarize demographic characteristics, cancer-related factors, family adaptation, benefit finding, and dyadic coping. We used the paired-sample *t*-test to describe the differences between patients and spouses regarding the primary study variables, and Pearson's correlation analysis was performed to describe the associations between patients and spouses on the key variables. In this study, we treated patients and spouses as distinguishable data sets. Using APIMeM, we studied the effect of dyadic coping between patients and their spouses on family adaptation and the mediating role of benefit finding. The APIMeM (27, 35) was used to test the hypotheses using bootstrap analysis with 5,000 bootstrap samples and a 95% confidence interval. The dyadic model was verified using χ^2/df (value < 3), comparative fit index (CFI value ≥ 0.90), Tucker–Lewis index (TLI value ≥ 0.90), and root mean square error of approximation (RMSEA value ≤ 0.08). SPSS25.0 and AMOS24.0 were used for conducting statistical analysis. A *P*-value of <0.05 was considered statistically significant.

Results

The demographic characteristics of breast cancer patients and their spouses showed that the majority of participants were office workers (51.6% of patients and 50.8% of spouses). Regarding marital status, the majority were married for the first time (77.2% of patients and 86.2% of spouses). Individual monthly income was predominantly in the range of 8,000 yuan and above (39.3% of patients and 45.5% of spouses). Regarding education, the majority of them had attained at least a primary or middle school level (64.3% of patients and 42.5% of spouses). In the majority of families with breast cancer patients, the spouse was in good health, with no health problems, accounting for 82.2%. Additionally, the majority of spouses cared for patients for <1 month (43.1%). In addition, a vast majority of breast cancer patients had a family history of the disease (74.1%), and the main type of breast cancer was *in situ*, accounting for 96.9%. See Table 1 for more detailed data.

Table 2 describes the mean value of the variables, the standard deviation, and whether each variable is different in the patient–spouse binary. The paired-sample *T*-test showed significant differences between patients and spouses in dyadic coping, benefit finding, and family adaptation. Patients' binary coping (115.45 ± 15.752), benefit finding (64.18 ± 11.793), and family adaptation (44.93 ± 8.906) were significantly lower than spouses' binary coping (125.32 ± 15.648), benefit finding (70.56 ± 11.941), and family adaptation (46.90 ± 8.973). Table 3 shows the correlation of the study variables. In the correlation analysis, significant associations were found between patient–spouse binary coping ($r = 0.144$, $p < 0.001$), benefit finding ($r = 0.198$, $p < 0.001$), and family adaptation ($r = 0.525$, $p < 0.001$), suggesting that patient–spouse binary relationships were not independent.

10.3389/fpubh.2024.1453830

TABLE 1 Demographic and cancer-related characteristics ($n = 325$).

Variable	Classification	Patient		Spouse	
		Frequency	Percent	Frequency	Percent
Occupation	Worker	22	6.7	22	6.77
	Farmer	39	12	51	15.69
	Employee	168	51.6	165	50.77
	Health care workers	37	11.3	41	12.62
	Teacher	39	12	29	8.92
	Retired	20	6.1	17	5.23
Marital status	First marriage	251	77.2	280	86.15
	Remarriage	74	22.7	45	13.85
Place of residence	City	161	49.5		
	Town	125	38.4		
	Countryside	39	12		
Personal monthly income	<1,000	4	1.2		
	1,000–3,000	42	12.9	48	14.77
	3,001–5,000	51	15.6	42	12.92
	5,001–8,000	100	30.7	87	26.77
	>8,000	128	39.3	148	45.54
Education level	Bachelor's degree or above	0	0	11	3.38
	College	38	11.6	95	29.23
	High school	78	24	81	24.92
	Primary school, Middle school	209	64.3	138	42.46
Family history of breast cancer	No	84	25.8		
	Yes	241	74.1		
Have you ever been diagnosed with other breast diseases?	No	6	1.8		
	Yes	319	98.1		
Your type of breast cancer	Carcinoma *in situ*	315	96.9		
	Invasive cancer	10	3.07		
The clinical classification of your breast cancer	I	204	62.7		
	II	110	33.8		
	III	11	3.3		
What kind of breast cancer surgery did you have?	Radical resection + lymph node dissection	157	48.3		
	Modified radical resection + lymph node dissection	98	30.1		
	Breast conservancy	70	21.5		
Relapse or not	Yes	70	21.5		
	No	255	78.4		
Medical payment status	At your own expense	4	1.2		
	Full reimbursement	29	8.9		
	Partial reimbursement	292	89.8		
Your breast cancer site	Left	309	95.08		
	Right	9	2.77		

(Continued)

TABLE 1 (Continued)

Variable	Classification	Patient		Spouse	
		Frequency	Percent	Frequency	Percent
	Both sides	7	2.15		
You have no health problems	Yes			267	82.15
	No			58	17.85
Have there been any major life stress events in the past 3 months	No			73	22.46
	Yes			252	77.54
How many days have you cared for the patient?	<1 month			140	43.08
	1–3 months			95	29.23
	3–6 months			90	27.69
Have someone with you to help care for the patient?	No			239	73.54
	Yes			86	26.46
Is there anyone else to take care of in addition to the caregiver?	No			186	57.23
	Yes			139	42.77

TABLE 2 Means, and SDs of the study variables for patient–spouse dyads ($N = 325$ dyads).

		Means	SD	P^a
DCI	Patients	115.45	15.752	$P = 0.01$
	Spouse	125.32	15.648	
BFS	Patients	64.18	11.793	$p < 0.001$
	Spouse	70.56	11.941	
FACES	Patients	44.93	8.906	$p < 0.001$
	Spouse	46.9	8.973	

[a]Paired-sample *t*-test.
BFS, Benefit Finding Scale; DCI, Dyadic Coping Inventory; FACES, Family Adaptability and Cohesion Evaluation Scales.

Actor–partner interdependence mediation model

In this study, we constructed a subjective and actor–partner mediation model of benefit finding, dyadic coping, and family adaptation for breast cancer patients and their spouses. The results showed that the model fit well (CMIN/DF = 2.754, CFI = 0.984, TLI = 0.961, IFI = 0.985, GFI = 0.983, RMSEA = 0.074).

The results in Tables 4, 5 show that the dyadic coping of patients ($B = 0.276$; $P < 0.05$; lower = 0.188; upper = 0.354) and spouses ($B = 0.244$; $P < 0.05$; lower = 0.163; upper = 0.317) impacts family adaptation. In addition, in the actor effect, the dyadic coping of patients ($B = 0.397$; $P < 0.001$; lower = 0.31; upper = 0.477) and spouses ($B = 0.298$; $P < 0.001$; lower = 0.191; upper = 0.402) impacts the benefit finding. In the partner effect, the patient's dyadic coping does not affect the partner's benefit finding ($B = 0.02$; $P = 0.608$), but the spouse's dyadic coping affects the patient's benefit finding ($B = 0.08$; $P = 0.03$; lower = 0.008; upper = 0.153).

In families of breast cancer patients, we have shown that benefit finding plays a mediating role between couples' dyadic coping and family adaptation. Specifically, we observe that the dyadic coping of patients ($B = 0.096$, $P < 0.001$; $B = 0.05$, $P < 0.001$) and their spouses ($B = 0.050$, 95% CI = 0.022–0.093, $P < 0.001$) has an actor effect on family adaptation and that this effect is partly mediated by benefit finding. In other words, the higher the level of dyadic coping of patients and their spouses, the more significant their benefit finding, leading to better family adaptation. In addition, we also found a partner effect: the dyadic coping of spouses can affect the patient's benefit finding and then affect the patient's family adaptation ($B = 0.019$, 95% CI = 0.003–0.045, $P < 0.05$). However, spouses' dyadic coping did not directly affect patients' family adaptation, possibly because patient benefit finding plays a mediating role (see Figure 3).

The percentage of explanatory variation for the benefit finding in patients and spouses was 30.89 and 15.6%, respectively. The percentage of explanatory variation for family adaptation in patients and spouses was 55.03 and 44.05%, respectively.

Discussion

Previous studies have focused on the factors influencing family adaptation (36, 37) and the impact of coping styles on family adaptation (38). This study further expands on these frameworks, exploring the actor–partner effect of dyadic coping on family adaptation from a dyadic perspective and examining the mediating role of benefit finding in this effect. This is the first study to examine the effects of binary coping and benefit finding on family adaptation.

In this study, the positive dyadic coping of patients and spouses can directly affect their family adaptation. Previous studies have shown that good dyadic coping between couples can

TABLE 3 Pearson's correlations and descriptive statistics of the study variables ($n = 325$).

Variable	M	SD	DCI-sp	BFS-sp	FACES-sp	BFS-p	DCI-p	DCI-p
DCI-sp	125.32	15.648	1					
BFS-sp	70.56	11.941	0.394**	1				
FACES-sp	46.90	8.973	0.562**	0.429**	1			
BFS-p	64.18	11.793	0.183**	0.198**	0.341**	1		
DCI-p	115.45	15.752	0.144**	0.083	0.341**	0.546**	1	
DCI-p	44.93	8.906	0.210**	0.191**	0.525**	0.611**	0.676**	1

BFS, Benefit Finding Scale; DCI, Dyadic Coping Inventory; FACES, Family Adaptability and Cohesion Evaluation Scales; P, patient; SP, spouse.
** $P < 0.001$.

TABLE 4 Significant and non-significant direct effects of study variables.

Parameter	Label	*B*	Lower	Upper	*P*
BFS-P ← DCI-P	a1	0.397	0.31	0.477	0.000
BFS-SP ← DCI-SP	a2	0.298	0.191	0.402	0.000
BFS-SP ← DCI-P	ap2	0.02	−0.059	0.098	0.608
BFS-P ← DCI-SP	ap1	0.08	0.008	0.153	0.03
FACES-P ← DCI-P	c1	0.276	0.188	0.354	0.001
FACES-SP ← DCI-SP	c2	0.244	0.163	0.317	0.001
FACES-P ← BFS-P	b1	0.243	0.132	0.352	0.000
FACES-SP ← BFS-SP	b2	0.168	0.075	0.271	0.001
FACES-SP ← DCI-P	cp2	0.116	0.053	0.188	0.000
FACES-P ← DCI-SP	cp1	0.031	−0.018	0.078	0.224
FACES-P ← BFS-SP	bp1	0.049	−0.015	0.114	0.115
FACES-SP ← BFS-P	bp2	0.082	−0.014	0.179	0.093

B, unstandardized estimate; BFS, Benefit Finding Scale; DCI, Dyadic Coping Inventory; FACES, Family Adaptability and Cohesion Evaluation Scales; P, patient; SP, spouse.

promote effective communication, enhance emotional stability, and contribute to family harmony (39). Effective dyadic coping enables couples to think from each other's perspective and understand one another when facing challenges, thereby enhancing family stability (40). For patients, the positive support, companionship, and care provided by the spouse can reduce the emotional pressure on the patient, convey love and care, and improve the confidence to overcome the disease and find the beauty of life (41). For spouses, good dyadic coping is considered an intrinsic resource for managing family crisis, which helps reduce caregivers' stress and burden (42, 43). This allows the spouse to work with the patient to overcome the challenges of the disease and have a positive experience.

A high level of dyadic coping is key for families to survive the crisis smoothly. The latest study confirms the conclusions of previous studies that the coping styles of patients and spouses impact the benefits finding (44, 45). When coping becomes a support system, good dyadic coping allows patients to trust that they will have support within the family when they encounter challenges (29). This support helps to enhance the individual's ability to overcome difficulties and thus find benefits in life. In addition, our findings show that the degree of benefit finding in patients and spouses can predict their family adaptation. Previous research has shown that individuals with higher levels of benefit finding are more inclined to cope with illness positively (46). Benefit finding helps individuals alleviate anxiety and depression while enhancing their ability to overcome difficulties so that families can better cope with crises and show good adaptability (41). Our study also found that the dyadic coping of breast cancer patients and their spouses indirectly affects their family finding through benefit findings. In the presence of negative emotions such as pessimism, good dyadic coping can be used as a resource within the family to help cope with crises and maintain family stability (47).

Limitations

There are some limitations to this study. First, it is impossible to infer a causal relationship between benefit finding, dyadic coping, and family adaptation using a cross-sectional design. At the same time, there is no restriction on the timing of the cancer diagnosis, which may lead to confounding factors affecting the outcome. Future longitudinal study designs are recommended to explore the relationship between these variables in depth and to understand the mechanisms by which patients at different stages of cancer interact with their spouses. Second, the data in this study are based on self-reports and there is a risk of reporting bias. The couples involved in the study may have had good family relationships,

10.3389/fpubh.2024.1453830

TABLE 5 Bootstrap test for indirect effects for the actor–partner interdependence mediation model with dyadic coping inventory as an independent variable, benefit finding as a mediator, and family adaptability as outcome.

Effect		*B*	Lower	Upper	*P*
Actor effect (Individual's dyadic coping inventory → Individual's family adaptability)					
Patient					
Total effect		0.373	0.301	0.433	0.001
Total indirect effects		0.097	0.056	0.145	0.000
Actor–actor	DCI-P → BFC-P → FACES-P	0.096	0.056	0.144	0.000
Partner–partner	DCI -P → BFC-SP → FACES-P	0.001	−0.002	0.009	0.378
Direct effects	DCI -P → FACES-P	0.276	0.188	0.354	0.001
Spouse					
Total effect		0.3	0.23	0.366	0.001
Total indirect effects		0.057	0.027	0.1	0.000
Actor–actor	DCI -SP → BFC-SP→ FACES-SP	0.05	0.022	0.093	0.000
Partner–partner	DCI -SP → BFC-P → FACES-SP	0.007	0	0.021	0.062
Direct effects	DCI-SP → FACES-SP	0.244	0.163	0.317	0.001
Partner effect (Individual's dyadic coping inventory → Partner's family adaptability)					
Patient					
Total effect		0.065	0.014	0.118	0.009
Total indirect effects		0.034	0.011	0.065	0.006
Actor–partner effect	DCI-SP → BFC-SP → FACES-P	0.014	−0.003	0.038	0.095
Partner–actor effect	DCI-SP → BFC-P→ FACES-P	0.019	0.003	0.045	0.02
Direct effects	DCI-SP → FACES-P	0.031	−0.018	0.078	0.224
Spouse					
Total effect		0.152	0.098	0.21	0.000
Total indirect effects		0.036	−0.001	0.077	0.056
Actor–partner effect	DCI -P → BFC-P → FACES-SP	0.033	−0.004	0.073	0.082
Partner–actor effect	DCI -P → BFC-SP→ FACES-SP	0.003	−0.008	0.022	0.539
Direct effects	DCI -P → FACES-SP	0.116	0.053	0.188	0.000

B, unstandardized estimate; β, standardized estimate; BFS, Benefit Finding Scale; DCI, Dyadic Coping Inventory; FACES, Family Adaptability and Cohesion Evaluation Scales; P, patient; SP, spouse.

limiting the generalizability of the results. Future studies may consider using other data collection methods to explore couples with a less positive family atmosphere. Third, the study focused solely on breast cancer in women and did not take into account gender differences, other types of cancer, or the racial demographics of the population. Therefore, it is not possible to explore in depth the differences between various cancer types and the differences between various ethnic groups. Future studies are suggested to provide a more specific analysis of different cancer types and to consider the effects of gender and ethnicity. Finally, the majority of spouses in our study cared for patients for a shorter period of time and their coping styles changed over time (some spouses had better coping styles at first, but these changed as they became bored or disappointed during the course of caring). In addition, the duration of a breast cancer patient's marriage to their spouse is also a factor to consider. Therefore, in future studies, we need to conduct longitudinal studies to explore how dyadic coping, benefit finding, and family adaptation evolve during the course of patient care.

Conclusion

This study highlights a codependent relationship between breast cancer patients and their spouses. Dyadic coping in spouses is associated with beneficial findings for patients and further influences the adaptation of patients' families. Therefore, clinical staff can use the Dyadic Coping Scale to identify patients and spouses with poor coping abilities and provide positive psychological interventions to enhance the dyadic coping ability between couples to help them overcome the problems encountered during treatment and better cope with family crises. At the same time, clinicians should encourage the patient's spouse to

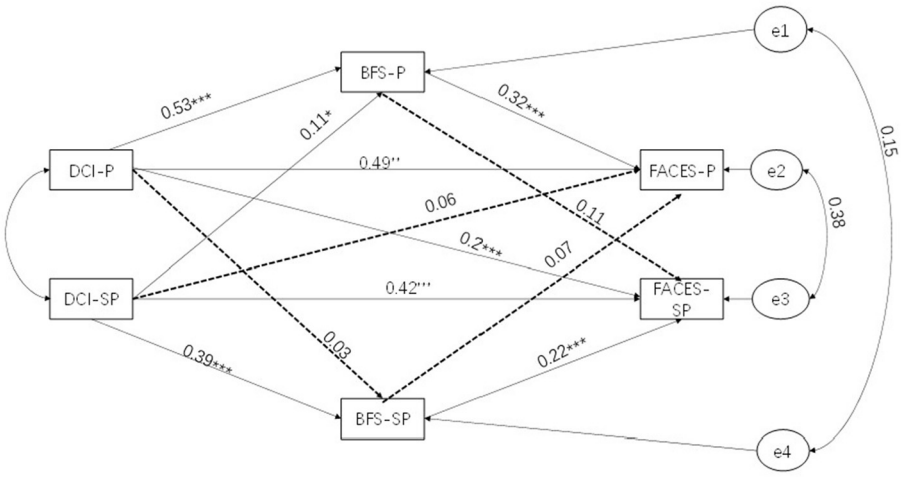


FIGURE 3
Actor–partner interdependence mediation model. DCI, Dyadic Coping Inventory; BFS, Benefit Finding Scale; FACES, Family Adaptability and Cohesion Evaluation Scales; *P*, patient; SP, spouse; ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

participate actively in the cancer treatment process to help the couple develop good coping abilities. Through combined psychological interventions, communication and understanding between cancer couples can be improved. This, in turn, helps them find good things in life, cope more effectively with family crises, and improve family adaptation. In implementing this measure, clinicians should provide comprehensive support and education for patients and their spouses, along with timely and effective adjustments of intervention strategies to prevent placing unnecessary burden on the patients' families. Encouraging patients and their spouses to participate in developing and implementing the care plan can improve communication and understanding between couples, strengthen their ability to cope with the crisis, and help the entire family better adapt to the crisis.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics Committee of Jinzhou Medical University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

ZD: Data curation, Formal analysis, Methodology, Project administration, Software, Writing – original draft, Writing – review & editing. YF: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing. GZ: Conceptualization, Data curation, Formal analysis, Resources, Software, Writing – review & editing. XZ: Conceptualization, Investigation, Software, Writing – review & editing. XL: Conceptualization, Investigation, Writing – review & editing. YQ: Investigation, Writing – review & editing. HC: Funding acquisition, Resources, Supervision, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This study was supported by the doctoral research Fund of Wannan Medical College (Approval No. WYRCQD202304). Funders have no role in research design, data collection and analysis, publication decisions, or manuscript preparation.

Acknowledgments

The authors sincerely thank the 650 participants who responded to the surveys and the nursing administrators from the collaborating hospitals for their support in this investigation.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* (2021) 71:209–49. doi: 10.3322/caac.21660

2. Zheng RS, Chen R, Han BF, Wang SM Li L, Sun KX, Zeng HM, et al. Cancer incidence and mortality in China, 2022. *Chin J Oncol.* (2024) 46:221–31. doi: 10.3760/cma.j.cn112152-20240119-00035

3. Mitchell AJ, Ferguson DW, Gill J, Paul J, Symonds P. Depression and anxiety in long-term cancer survivors compared with spouses and healthy controls: a systematic review and meta-analysis. *Lancet Oncol.* (2013) 14:721–32. doi: 10.1016/S1470-2045(13)70244-4

4. Mao S, Lu H, Zhang Y, Yu J, Li X, Peng J, et al. Evaluation of psychosocial pathways to family adaptation of Chinese patients with liver cancer using the McCubbin's Family Resilience Model. *Front Psychiatry.* (2021) 12:703137. doi: 10.3389/fpsyt.2021.703137

5. Li J, Liu L, Chen M, Su W, Yao T, Li X. Effect of intimacy and dyadic coping on psychological distress in pancreatic cancer patients and spousal caregivers. *Front Psychol.* (2023) 14:1040460. doi: 10.3389/fpsyg.2023.1040460

6. Chen W, Li H, Cai JZ, Qin N. Association between dyadic coping and quality of life in breast cancer patients and their spouses: an actor-partner interdependence mediation model. *Asian Nurs Res.* (2024) 18:44–50. doi: 10.1016/j.anr.2024.01.007

7. Wang N, Wang K, Lu X, Zhang S, Sun X, Zhang Y. Effects of family dignity interventions combined with standard palliative care on family adaptability, cohesion, and anticipatory grief in adult advanced cancer survivors and their family caregivers: a randomized controlled trial. *Heliyon.* (2024) 10:e28593. doi: 10.1016/j.heliyon.2024.e28593

8. Yeom HE, Park DS. Mediating and moderating effects of uncertainty on the relationship between family function, self-care, and depression among blood cancer survivors. *Behav Sci.* (2024) 14:170. doi: 10.3390/bs14030170

9. Park YY, Jeong YJ, Lee J, Moon N, Bang I, Kim H, et al. The influence of family adaptability and cohesion on anxiety and depression of terminally ill cancer patients. *Support Care Cancer.* (2018) 26:313–21. doi: 10.1007/s00520-017-3912-4

10. Huang BS, Lin CY, Hung TM, Chung CF, Chang YL, Chen SC. Factors influencing family function in spousal caregivers of head and neck cancer patients within 6 months posttreatment. *Support Care Cancer.* (2022) 30:7313–22. doi: 10.1007/s00520-022-07158-4

11. Zhou Y, Hu D, Zhang K, Mao J, Teng F, Yu T, et al. The mechanism of family adaptability and cohesion in suicidal ideation among Chinese cancer patients. *J Psychosoc Oncol.* (2020) 38:612–26. doi: 10.1080/07347332.2020.1757799

12. Li Y, Wang K, Yin Y, Li Y, Li S. Relationships between family resilience, breast cancer survivors' individual resilience, and caregiver burden: a cross-sectional study. *Int J Nurs Stud.* (2018) 88:79–84. doi: 10.1016/j.ijnurstu.2018.08.011

13. Mei YX, Xiang DD, Zhang ZX, Twumwaah Budu J, Lin BL, Chen SY. Family function, self-efficacy, care hours per day, closeness and benefit finding among stroke caregivers in China: a moderated mediation model. *J Clin Nurs.* (2023) 32:506–16. doi: 10.1111/jocn.16290

14. Jahnen M, Bayer P, Meissner VH, Schiele S, Schulwitz H, Gschwend JE, et al. Benefit finding in men affected by prostate cancer prior to and following radical prostatectomy - a cross-sectional study with a stratified sample. *BMC Cancer.* (2023) 23:508. doi: 10.1186/s12885-023-11018-7

15. Cao Q, Gong J, Chen M, Lin Y, Li Q. The dyadic effects of self-efficacy on quality of life in advanced cancer patient and family caregiver dyads: the mediating role of benefit finding, anxiety, and depression. *J Oncol.* (2022) 2022:3073358. doi: 10.1155/2022/3073358

16. Helgeson VS, Reynolds KA, Tomich PL. A meta-analytic review of benefit finding and growth. *J Consult Clin Psychol.* (2006) 74:797–816. doi: 10.1037/0022-006X.74.5.797

17. Ding Z, Fan Y, Li E, Ai F, Cui H. Latent profile analysis of family adaptation in breast cancer patients-cross-sectional study. *Sci Rep.* (2024) 14:21357. doi: 10.1038/s41598-024-72410-2

18. Abulaiti B, Zhang X, Guan T, Wang M, Jia S, Wang A. The dyadic care experiences of elderly individuals with disabilities and caregivers in the home setting from the perspective of family resilience: a qualitative study. *Front Psychiatry.* (2022) 13:963101. doi: 10.3389/fpsyt.2022.963101

19. Randall AK, Bodenmann G. Stress and its associations with relationship satisfaction. *Curr Opin Psychol.* (2017) 13:96–106. doi: 10.1016/j.copsyc.2016.05.010

20. Zimmermann T. Intimate relationships affected by breast cancer: interventions for couples. *Breast Care.* (2015) 10:102–8. doi: 10.1159/000381966

21. Lau N, Ramos KJ, Aitken ML, Goss CH, Barton KS, Kross EK, et al. "We'll deal with it as it comes": a qualitative analysis of romantic partners' dyadic coping in cystic fibrosis. *J Soc Pers Relat.* (2024) 41:689–705. doi: 10.1177/02654075231190617

22. Van Schoors M, Loeys T, Goubert L, Berghmans G, Ooms B, Lemiere J, et al. Couples dealing with pediatric blood cancer: a study on the role of dyadic coping. *Front Psychol.* (2019) 10:402. doi: 10.3389/fpsyg.2019.00402

23. Liu W, Lewis FM, Oxford M, Kantrowitz-Gordon I. Common dyadic coping and its congruence in couples facing breast cancer: the impact on couples' psychological distress. *Psychooncology.* (2024) 33:e6314. doi: 10.1002/pon.6314

24. Ruark A, Bidwell JT, Butterfield R, Weiser SD, Neilands TB, Mulauzi N, et al. "I too have a responsibility for my partner's life": Communal coping among Malawian couples living with HIV and cardiometabolic disorders. *Soc Sci Med (1982).* (2024) 342:116540. doi: 10.1016/j.socscimed.2023.116540

25. Schock-Giordano AM. Ethnic families and mental health: application of the ABC-X model of family stress. *Sage Open.* (2013) 3:2158244013478015. doi: 10.1177/2158244013478015

26. Kenny DA, Cook W. Partner effects in relationship research: conceptual issues, analytic difficulties, and illustrations. *Pers Relatsh.* (1999) 6:433–48. doi: 10.1111/j.1475-6811.1999.tb00202.x

27. Kenny DA, Ledermann T. Detecting, measuring, and testing dyadic patterns in the actor-partner interdependence model. *J Fam Psychol.* (2010) 24:359–66. doi: 10.1037/a0019651

28. Kang H. Sample size determination and power analysis using the G*Power software. *J Educ Eval Health Prof.* (2021) 18:17. doi: 10.3352/jeehp.2021.18.17

29. Bodenmann G. A systemic-transactional conceptualization of stress and coping in couples. *Swiss J Psychol.* (1995) 54:34–49. doi: 10.1111/j.1749-6632.1995.tb38155.x

30. Xu F, Hilpert P, Randall AK Li Q, Bodenmann G. Validation of the dyadic coping inventory with Chinese couples: factorial structure, measurement invariance, and construct validity. *Psychol Assess.* (2016) 28:e127–40. doi: 10.1037/pas0000329

31. Antoni MH, Lehman JM, Kilbourn KM, Boyers AE, Culver JL, Alferi SM, et al. Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychol.* (2001) 20:20–32. doi: 10.1037/0278-6133.20.1.20

32. Liu Z, Zhang F, Gudenkauf L. Cross-cultural adaptation of the Benefit Finding Scale(BFS) in Chinese Cancer Patients. *Chin J Nurs.* (2015) 50:561–6. doi: 10.3761/j.issn.0254-1769.2015.05.010

33. Olson DH, Sprenkle DH, Russell CS. Circumplex model of marital and family system: I. Cohesion and adaptability dimensions, family types, and clinical applications. *Fam Process.* (1979) 18:3–28. doi: 10.1111/j.1545-5300.1979.00003.x

34. Phillips MR, West CL, Shen Q, Zheng Y. Comparison of schizophrenic patients' families and normal families in China, using Chinese versions of FACES-II and the Family Environment Scales. *Fam Process.* (1998) 37:95–106. doi: 10.1111/j.1545-5300.1998.00095.x

35. Priem JS. *Actor–Partner Interdependence Model. The International Encyclopedia of Interpersonal Communication.* New York, NY (2015). p. 1–6.

36. Guyard A, Michelsen SI, Arnaud C, Fauconnier J. Family adaptation to cerebral palsy in adolescents: a *European* multicenter study. *Res Dev Disabil.* (2017) 61:138–50. doi: 10.1016/j.ridd.2016.11.010

37. Park M, Choi EK Lyu CJ, Han JW, Hahn SM. Family resilience factors affecting family adaptation of children with cancer: a cross-sectional study. *Eur J Oncol Nurs.* (2022) 56:102078. doi: 10.1016/j.ejon.2021.102078

38. Hesamzadeh A, Dalvandi A, Bagher Maddah S, Fallahi Khoshknab M, Ahmadi F. Family adaptation to stroke: a metasynthesis of qualitative research based on double ABCX model. *Asian Nurs Res.* (2015) 9:177–84. doi: 10.1016/j.anr.2015.03.005

39. Li T, Liu RX, Lau EYY. Companionship goals and marital goal concordance contribute to relationship satisfaction partly through dyadic coping in dating couples. *Anxiety Stress Coping*. (2024) 37:685–98. doi: 10.1080/10615806.2024.2338107

40. Bröning S, Wartberg L. Attachment orientations: associations with romantic partners' self-regulation and dyadic coping. *J Sex Marit Ther*. (2024) 50:512–26. doi: 10.1080/0092623X.2024.2322566

41. Wen X, Wang D, Li N, Qin X, Gu D. The construction of the structural equation model of burden, benefit finding, and anxiety-depression of esophageal cancer caregivers based on Lazarus stress and coping theory. *Ann Palliat Med*. (2021) 10:7644–52. doi: 10.21037/apm-21-1466

42. Gardner MH, Mrug S, Schwebel DC, Phipps S, Whelan K, Madan-Swain A. Demographic, medical, and psychosocial predictors of benefit finding among caregivers of childhood cancer survivors. *Psychooncology*. (2017) 26:125–32. doi: 10.1002/pon.4014

43. Ferraris G, Gérain P, Zarzycki M, Elayan S, Morrison V, Sanderman R, et al. The associations of dyadic coping strategies with caregiver's willingness to care and burden: a weekly diary study. *J Health Psychol*. (2024) 29:935–49. doi: 10.1177/13591053231223838

44. Li L, Zhong HY, Xiao T, Xiao RH, Yang J, Li YL, et al. Association between self-disclosure and benefit finding of Chinese cancer patients caregivers: the mediation effect of coping styles. *Support Care Cancer*. (2023) 31:684. doi: 10.1007/s00520-023-08158-8

45. Liu Z, Zhang L, Cao Y, Xia W, Zhang L. The relationship between coping styles and benefit finding of Chinese cancer patients: the mediating role of distress. *Eur J Oncol Nurs*. (2018) 34:15–20. doi: 10.1016/j.ejon.2018.03.001

46. Yang J, Yan HL Li YQ, Zhang L, Qiu XY, Tian YH, Gong YL, et al. Benefit finding in chronic kidney disease patients receiving hemodialysis: a cross-sectional study. *BMC Nephrol*. (2024) 25:46. doi: 10.1186/s12882-024-03480-7

47. Li H, Zhang L, Wang W, Xiang D, Zhang Z, Mei Y. Benefit finding in first-ever young and middle-aged patients who had a stroke and their spousal caregivers in China: a longitudinal mixed-methods study protocol. *BMJ Open*. (2022) 12:e062859. doi: 10.1136/bmjopen-2022-062859

frontiers | Frontiers in Psychiatry

TYPE Methods
PUBLISHED 10 December 2024
DOI 10.3389/fpsyt.2024.1425514

OPEN ACCESS

EDITED BY
Julia Knopes,
Case Western Reserve University,
United States

REVIEWED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States
Talia Weiner,
University of West Georgia, United States

*CORRESPONDENCE
Hanie Edalati
hanieedalati@gmail.com

RECEIVED 29 April 2024
ACCEPTED 15 November 2024
PUBLISHED 10 December 2024

CITATION
Edalati H, Katan C and Taha S (2024) Evaluation of the outcomes of equity-deserving individuals receiving services and support from integrated substance use health and mental health services: a pilot study protocol.
Front. Psychiatry 15:1425514.
doi: 10.3389/fpsyt.2024.1425514

Evaluation of the outcomes of equity-deserving individuals receiving services and support from integrated substance use health and mental health services: a pilot study protocol

Hanie Edalati*, Christina Katan and Sheena Taha

Canadian Centre on Substance Use and Addiction (CCSA), Ottawa, ON, Canada

Background: Given the close relationship that can exist between substance use health and mental health (SUHMH) concerns, the need for more integrated services and support has been identified. However, research on the effective integration of SUHMH services and their impact on outcomes of individuals accessing them remains limited. In particular, the unique outcomes of individuals facing significant structural inequities in the health care system, i.e., Indigenous Peoples in Canada, including First Nations, Inuit and Métis (FNIM), and equity-deserving (ED) groups, have not been evaluated while receiving integrated SUHMH services. This paper describes the protocol for a pilot research project, which will evaluate the change in clinical and social outcomes of individuals receiving integrated SUHMH services in relation to their intersectionality status, a linear score ranging from identifying with no FNIM and ED groups to identifying with one or multiple groups.

Methods: This study recruits 100 individuals who receive SUHMH services and support from a community health center in Ottawa, Canada and assessed their FNIM and ED status and clinical and social outcomes at baseline and three-month follow-up. At the time of writing this manuscript, the baseline data collection was completed. Follow up assessment occurs three months after baseline data was collected. A smaller group of these participants will be purposefully selected match the proportion of FNIM and ED groups from the two-time assessment. They will be invited to participate in a post-data analysis validation consultation session to ensure that the findings are reflective of the experiences of individuals receiving SUHMH services, alternative interpretations are brought forward, and implications are driven by those who will be most impacted. This consultation may also inform knowledge mobilization activities and future studies. This study also recruited staff in different roles from the providing center to rate the implementation of key dimensions of equity-oriented care into their practices and their level and capability to provide integrated services and support to individuals with cooccurring substance use disorders and mental illnesses.

Discussion: The results of this study will inform integrated SUHMH services by emphasizing equity and inclusive approaches, and engagement with the community. Substance use health; Mental health; Integrated services and support; Equity-deserving populations; Equity-oriented care.

KEYWORDS

substance use health, mental health, integrated services and support, equity-deserving populations, equity-oriented care

1 Introduction

Evidence from several studies has indicated that substance use disorders often cooccur with mental illnesses (1–3). Individuals living with cooccurring substance use disorders and mental illnesses experience poorer treatment outcomes, shorter stays in treatment, lower rates of treatment completion, and higher rates of recurrence and rehospitalization after treatment (4–6) than those with substance use disorders only. Cooccurring mental illnesses also create several challenges for people who need both substance use health and mental health (SUHMH) services. Furthermore, individuals living with cooccurring substance use disorders and mental illnesses may have difficulty identifying and accessing available services, coordinating and navigating them, and receiving appropriate SUHMH services (7, 8). Given these concerns and the close relationship that can exist between substance use health and mental health, the need for more integrated services and support has been identified (9).

Integrated SUHMH care is generally defined as *"the degree of linkage or collaboration between substance use and mental health—ranging from cooperation to amalgamation—at both the service and system levels"* (10). There are many types and levels of integration (11), ranging from the coordination of services between two or more services in different locations to the integration of service provider processes (e.g., sharing administrative and financing systems), to fully integrated programs provided in one location (12). Each model requires different resources and operational processes and may have different impacts on individuals' outcomes. Yet, research on the effective integration of SUHMH services and how to operationalize them to improve individuals' outcomes remains limited (13).

A recent systematic review of 28 studies on the impact of physically co-locating SUHMH services on the health outcomes of individuals receiving these services indicated that co-located integrated services were consistently correlated with improved patterns of treatment engagement and remission or abstinence from substance use (14). In addition, there was modest evidence indicating that co-located SUHMH services were associated with reduced mental health symptom severity, decreased rates of emergency department presentations and hospitalizations, and improved quality of life. (14). However, most previous studies had a relatively high risk of bias and analysis could not isolate the independent effect of physical co-location from other aspects of integrated care models (e.g., integration of service processes, care coordination) (14). In addition, most previous studies on SUHMH services and support are focused on general populations of individuals receiving these services. There is limited data on outcomes of specific groups of people who access and receive these services, particularly those who are mostly exposed to marginalization, discrimination, and injustices (15).

Individuals who experience the greatest health and social inequities often have more challenges receiving adequate health care services and have poorer experiences in the health care system, particularly due to biases and stigma (16, 17). Findings from previous reviews of scientific and grey literature and a study with people with lived or living experiences (PLLEs) (18–20) indicated that there is limited evidence showing that all individuals receiving SUHMH services meaningfully engage and equally benefit from the current integrated SUHMH services. In particular, the unique needs and experiences of individuals facing significant structural inequities in the health care system, i.e., equity-deserving (ED) populations, have often not been considered in the process of integrating and implementing SUHMH services. ED populations are communities who experience significant collective barriers and multiple layers of oppression. They have historically been denied equal access to employment, education, health care or other opportunities to thrive based on their age, ethnicity, nationality, race, disability, gender identity and expression, sexual orientation, economic status, etc. (21). Other groups who experience significant systemic discrimination and barriers in accessing and receiving proper heath care are Indigenous Peoples in Canada, including First Nations, Inuit and Métis (FNIM). However, since many of FNIM individuals and communities do not identify with or want to be considered ED populations, these three distinct groups are named independently. Many of these different social identities and structures intersect to shape individual and group experiences. Intersectionality is not just about the sum of social identities (e.g., race, gender, socioeconomic status), but about how these identities

Abbreviations: SUHMH, Substance use health and mental health; FNIM, First Nations, Inuit and Métis; ED, equity-deserving; PLLEs, people with lived or living experiences.

interact within systems of power and oppression which may impact individual's experiences and outcomes of various services and support.

To improve access to quality services for these populations, many SUHMH services and support in Canada have sought to increase the use of equity-oriented care in their practices, such as trainings on trauma-informed care and sensitivity to cultural differences. However, it is not clear whether and how these practices influence the outcomes of individuals with multiple intersections receiving SUHMH services. To address these gaps in the literature, the Canadian Centre on Substance Use and Addiction (CCSA) is conducting a pilot study to better understand the specific outcomes of individuals receiving integrated SUHMH services in relation to their intersectionality status. This study focuses on the following five ED groups: 2SLGBTQIA+, newcomers to Canada, visible minorities, persons with disabilities and women. Since many people may identify with more than one FNIM and ED group (e.g., being a newcomer to Canada and woman), the analysis considers the moderating effect of a linear score, ranging from identifying with no FNIM and ED groups to identifying with one or multiple groups (i.e. intersectionality score). The main aim of this pilot study is to evaluate the changes in the clinical and social outcomes of individuals receiving integrated SUHMH services at baseline and three months later in relation to their intersectionality score. We are interested to understand whether the outcomes of individuals who are not in any FNIM and ED groups or who have fewer intersections (i.e., identify with less groups) differ from those with more FNIM and ED intersections (i.e., higher scores).

A second objective of this study also aims to explore whether two qualities of the providing center have an impact on individuals' outcomes in relation to their intersectionality score: (1) the implementation of key dimensions of equity-oriented care in the services and (2) the level and capability to provide services and support to individuals with cooccurring mental health and substance use disorders (level of integrated SUHMH services). This study recruits staff members who provide services and support, in a variety of roles, to service participants to rate their center on these qualities.

Third, we incorporate the expertise of PLLEs to seek feedback on a) the study results to ensure the findings resonate with individuals receiving SUHMH services and b) the outcome measures used to ensure that they are meaningful and reflective of the experiences of PLLEs in the community. To meet this goal, a smaller group of participants from those who complete the two-time assessment sessions are invited to participate in a post-data analysis validation consultation session with the research team.

2 Methods

At the time of writing this manuscript, the baseline data collection has been completed (March 22, 2024). The follow up assessment begins at three months (June 2024).

2.1 Study design

This study is a pilot longitudinal study assessing the outcomes of individuals accessing Oasis program at the Sandy Hill Community Health Centre for SUHMH concerns at baseline and at the three-month follow-up. Sandy Hill Community Health Centre is located in Ottawa, Ontario. The Oasis program provides various harm reduction-based health and social services (including HIV and Hep C treatment) for people who use substances and experience barriers to health and recovery due to stigma, poverty, criminalization, and mental illness. The Oasis program provides various SUHMH services in the same location, such as access to supervised consumption services, opioid agonist treatment (OAT), counselling or psychosocial supports, crisis counselling and access to a psychiatrist.

2.2 Participant recruitment and eligibility

2.2.1 Service participants

We recruit 100 individuals who utilize SUHMH services and support (i.e., service participants) from the Oasis program. Participants must meet the following inclusion criteria to participate in the study: must be over the age of 18, must receive SUHMH services from the Oasis program, are literate in English (be able to read and write at a Grade 7 level), and be in a stable physical and mental status to participate in the study. Eligible individuals are invited to participate in the two assessment sessions.

From those who complete the two-time assessment sessions and interested in participation in one post-data analysis consultation session, we invite twelve service participants at random. We give selected participants a week to respond before contacting the next interested participants. Twelve service participants who accept and sign the consent form provide their perspectives on the research findings and the outcome measures used.

2.2.2 Staff participants

Five staff members from the Oasis program are invited to participate in the study. Staff participants include those providing services to service participants in a variety of roles, such as nurses, physicians, and peer workers, to reflect their diverse experiences providing services in the center.

2.3 Procedure

2.3.1 Consultation with the center providing SUHMH services

Before starting the study, designated people from the providing center (i.e., the Oasis team) reviewed and approved all materials including the protocol, assessment materials (e.g., questionnaires), and consent forms. Certain questions or questionnaires that were identified as inappropriate or trauma-triggering for the specific population visited in this center were removed or replaced before finalizing the assessment package. In collaboration with the Oasis

team, we developed a crisis protocol in the event participation in the study causes any distress to the participants.

2.3.2 Engagement plan for people with lived or living experiences

We provide funding to the Oasis program to hire the community workers, PLLEs who work at the center, to support the study's research activities. They closely collaborate with the research assistant to recruit and signup participants for the study, follow up for the three-month assessment, and support crisis intervention as needed during assessment sessions. This engagement plan is designed to foster a collaborative and inclusive process, ensuring that the study activities are supported by the lived experiences of the community, recognizing the invaluable expertise that PLLEs hold and their pivotal role in establishing trust and rapport with their peers.

2.3.3 Two-time longitudinal assessments of service participants

Service participants are assessed at baseline and again at the three-month follow-up. With help from the Oasis staff, we distribute flyers and invite individuals accessing services and support in the center to participate in the study (N = 100). Interested participants provide written consent for their participation in the study before starting the first assessment session. The recruitment and assessment of one hundred service participants at baseline were started on February 29, 2024, and completed on March 22, 2024. Three months after the baseline assessment (June 2024), participants are informed via their preferred method of access (i.e., email, Phone, or staff of the Oasis program) that they can ask to make an appointment with research team to participate in the second assessment session.

During both the baseline and follow-up assessment sessions, a research assistant readies the participant before starting the assessment. This includes giving instructions, explaining study goals and procedures for participants, and answering any questions. The research assistant reads the questionnaires to the participants and asks them to provide their answer to each question. If participants no longer wish to continue with questionnaires, they are free to leave the room at any time. Staff onsite and a community worker are always there to provide assistance if participants seek additional support or counselling. Before starting the assessment, the research assistant reviews these options with participants. Each assessment session takes approximately one hour. Participants are compensated CAD50 at each of the two assessment points (total CAD100). This information is provided in the informed consent form.

2.3.4 Assessment of staff participants

Five staff members from the providing center are invited to participate in the study and rate their program's state of integrating equity-oriented care and capability to provide integrated SUHMH services. We ask the Oasis program manager to send out an email to the staff members and ask interested individuals to connect with study's research assistant to participate in the study. We recruited one staff member in each of the following job groups to complete the questionnaires: nurses, physicians, mental health clinicians, harm reduction workers and, peer workers. Responses from staff participants remain confidential and an average of their responses will be used in the analysis to protect confidentiality and reduce the risk of bias in responding. The assessments take approximately one hour to complete. The staff participants complete the questionnaires on their own (time) at baseline and are compensated CAD50 for their participation. The recruitment and assessment of five staff participants were started and completed during the month of March 2024.

2.3.5 Post-data analysis consultation

Since this is a pilot study, the team seeks feedback on both the study results and the outcome measures used to apply lessons learned for the scale up of the study in other contexts. This phase involves offering validation sessions where a group of twelve service participants can provide insights and perspectives on the research findings and other analysis/variables that should be considered. This approach is used to validate whether the conclusions are appropriate and/or provide alternative interpretations and implications. The participants will be purposely selected to match the proportion of FNIM and ED groups from the two-time assessment to ensure representation. Examples of questions asked will include: *Does your experience match up with what was found in the study?; What parts of the findings resonated the most?; Do you think there is anything about your experiences that the findings didn't catch?; What factors (e.g., cultural, social, financial) do affect your experiences when accessing SUHMH services?; How do factors such as your race, gender, or disability intersect to shape your access and experiences of SUHMH services?* This approach ensures that the study accurately reflects the experiences of participants. The collaborative approach of this engagement plan underscores the commitment to inclusivity and relevance in the pursuit of improved healthcare outcomes for ED groups.

2.3.6 Duration of the research project

The pilot project, including recruitment, two-time assessments, data analysis, writing of reports, and knowledge mobilization activities, lasts for 12 months starting in February 2024.

2.4 Outcome measures

2.4.1 Assessment of service participants

2.4.1.1 Equity deserving questionnaire

To identify the FNIM and ED status of participants, the most updated version of the self-identification questionnaire developed by the three Canadian federal research funding agencies is used. The questionnaire covers eight dimensions: age, gender identity, sexual orientation, FNIM identity, racialized identity, population group, disability, and language. The research team added two questions to identify newcomer status based on the definition introduced by Statistics Canada in 2006. Recent immigrants (also known as

newcomers) refer to landed immigrants who came to Canada up to five years prior to a given census year (Statistics Canada, 2006).

2.4.1.2 International consortium for health outcomes measurement

The ICHOM Addiction set is used to assess several outcome measures related to substance use and addictive behaviors, including demographic factors, frequency and quantity of substance use, severity of dependence, symptoms of post-traumatic stress disorder (PTSD), global functioning, and quality of life. The ICHOM Patient-Centered Outcome Measures for Addiction (22) is developed based on a globally applicable, minimum standard set of outcome measures for people who seek treatment for substance use and mental illnesses. This outcome measure set is the result of collaboration among leading physicians, measurement experts, and people with lived experiences.

2.4.1.3 Modified mini screen

MMS (23) is used to screen for mood, anxiety, and psychotic spectrum disorders. The original questionnaire has twenty-two questions with yes/no responses. We removed two questions related to the experience of trauma because of the overlap with questions included in the ICHOM.

2.4.1.4 Current and past use of substance use and mental health services and support

Two separate tables are developed specifically for this study in collaboration with the providing center (i.e., Oasis team). These tables assess participants' use of substance use and mental health services and support in the past year (at baseline assessment) and past 90 days (at follow-up assessment) including services received in the current center and elsewhere. This includes the type of services, such as harm reduction services for substance use health and psychotherapy for mental health, and the number of days in each service.

2.4.1.5 Assessment of needs

A short questionnaire including open-ended questions is developed specifically for this study in collaboration with the providing center (i.e., Oasis team). This is used to assess participants' needs to receive various services, such as emotional and mental health, physical health, and housing.

2.4.2 Assessment of staff members

2.4.2.1 EQUIP rate your organization tools

Four tools are used to assess providing center's actions and capacity for equity-oriented care. The first one, which includes ten items, assesses organizations in terms of their general capacity and integration level of equity-oriented health services (24). The other three, each including ten items, are designed to assess organizations on three key dimensions of equity-oriented health care: addressing anti-Indigenous racism (25), harm reduction and reducing substance use stigma (26), and trauma- and violence-informed care (27). These tools have generally been used to enhance the capacity to provide equity-oriented services in different health care settings (e.g., 28, 29).

2.4.2.2 Dual diagnosis capability in addiction treatment version 4.0

DDCAT (30) measures the ability of substance use providers to meet the needs of individuals with cooccurring mental health and substance use disorders. The DDCAT evaluates 35 program elements that are subdivided into seven dimensions: program structure, program milieu, clinical process (assessment and treatment), continuity of care, staffing, and training. Previous studies have shown support for the psychometric properties of the measures (e.g., inter-rater reliability, internal consistency, and sensitivity to change) (30).

3 Data management and analysis

The participants' responses to the questionnaires and interviews (both service participants and staff participants) will be entered into a Statistical Package for the Social Sciences (SPSS) by the study's research assistant. The data will be cleaned, and quality checked before data analysis. Descriptive statistics will be utilized to describe the sample at baseline and at the three-month follow-up.

A series of multilevel generalized estimating equations (GEEs) will be conducted to examine the change in each outcome measure (e.g., change in substance use rate, mental health symptoms, quality of life). GEE accounts for the correlation among repeated measures and examines the relationships between different variables within the model at multiple time points simultaneously. Outcome analyses will test whether the reported outcome rates change over the 3-month period, when a linear score for intersectionality score (ranging from identifying with no FNIM and ED groups to identifying with one or multiple groups) is entered as the moderator. GEE analyses will control for potential confounding variables (e.g., length of stay in current services, number and type of services received inside and outside of the providing center).

In the following steps, separate analyses will be utilized in which the center's score on EQUIP (level of integration of equity-oriented care) and DDCAT (center's capability to meet the needs of individuals with cooccurring MH disorders) will be entered in the analyses as moderators to test whether the change in reported outcomes of individuals differ based on the center's qualities on these scores.

Qualitative thematic analysis will be used for summarizing and interpreting the findings of the post-data analysis consultation.

4 Ethics and Dissemination

4.1 Research ethics approval

This pilot study is approved by the Advarra Institutional Review Board (IRB) (Pro00076474).

4.2 Consent and confidentiality

Ensuring the safety and well-being of participants is a top priority. Prior to participation, all potential participants receive a detailed explanation of the study's purpose, procedures, potential risks, and benefits. They are given multiple opportunities to ask questions and provide informed consent voluntarily. The consent forms clearly outline the use of their data and their right to withdraw from the study at any time without repercussions. Service participants are reassured that their decision to participate in the study or to withdraw from the study at any time do not have any negative consequences to the medical care or other services to which they are entitled or are presently receiving.

Both service and staff participants are asked to provide written informed consent before participating in the study. This includes signing (1) one informed consent form for participation in two-time assessment sessions for service participants, (2) one informed consent form for participation in the post-data analysis consultation session for a sub-group of service participants, and (3) one informed consent form for participation in one assessment session for staff participants.

The names of the participants are not used in any discussion or correspondence about the data. The findings of this study do not appear in participants' records or files. No information that discloses participants' identities are released or published and no records that identify participants by name or initials are allowed to leave the research investigators' offices.

4.3 Access to data

All data are confidential, where participants' data are only stored using unique research IDs securely in electronic and/or physical formats. Electronic data are stored on password-protected and encrypted devices, while physical records are kept in locked storage at the research team's office, with access only by the study team. Electronic files are kept for at least five years and possibly longer. Paper (physical) materials are stored for five years following the completion of the study in locked cabinets at the research team's office where access is limited, after which point these materials will be destroyed securely. Data sharing is restricted. De-identified electronic files containing quantitative and qualitative data are only used for data analysis.

4.4 Dissemination and knowledge mobilization plans

The study team will seek to disseminate findings through publishing in academic journals, presenting at conferences, developing policy briefs, and sharing recommendations and next steps with SUHMH services providers across Canada. The study team will also create a knowledge mobilization plan that will engage with appropriate partners and different levels (e.g., front line service providers, jurisdictional and federal decision makers) to ensure that tailored and key messaging is not only received but also implemented by the appropriate audience. Various knowledge products may be created as a result.

5 Discussion

FNIM and ED individuals with substance use disorders and mental illnesses may have different experiences regarding access, treatment engagement, clinical and social outcomes, and quality of life before, during and after receiving SUHMH services and support. The current study seeks to better understand the outcomes of individuals receiving integrated SUHMH services in relation to their intersectionality status. The results of this study will particularly show whether an individual's intersectionality score, ranging from identifying with no FNIM and ED groups to identifying with one or multiple groups, impact their outcomes over a course of three months receiving such services. The findings and lessons learned may be used to improve practices and inform policies to better address the specific needs of different FNIM and ED groups. The findings of this study will inform integrated SUHMH community services by emphasizing equity and inclusive approaches.

This pilot study has several limitations. First, this research is being conducted in a single community health center providing specific SUHMH services and support. Therefore, the findings from this study may not be generalizable to other populations or other SUHMH settings providing services and support. However, the findings of this study will be used to inform other contexts and regions for future phases of the project, including future research with settings of varying degrees and models of service integration. Second, we expect that the rate of attrition will be high in the second follow-up assessment which may affect the evaluation of changes in service participants' outcomes. This was mitigated by gathering as large a sample size as possible at baseline, to allow sufficient power for follow up analyses even if significant attrition occurs. Third, the small number of participants in this study will not allow for disaggregation of the data to compare each FNIM and ED group with others or explore within each FNIM and ED group (e.g., transgender people in 2SLGBTQIA+ group). Finally, for this study, we focus on ED groups that are traditionally known to experience high levels of collective barriers and discrimination in the health care system and society in general. However, there may be other groups outside of these communities that are also affected by similar inequity in accessing and receiving health care services. Future research should identify and include other less known and studied groups to ensure greater inclusivity.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Advarra Institutional Review Board (IRB). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

HE: Conceptualization, Writing – original draft. CK: Conceptualization, Writing – review & editing. ST: Conceptualization, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. The authors gratefully acknowledge funding support from Health Canada.

Acknowledgments

The authors thank Ms. Wendy Stewart, director of the OASIS Program, and Mr. Derrick St John, Oasis Program Manager, who provide their kind and generous time and support along with the necessary space and staff members for conducting this study. The authors also thank all the community workers at Sandy Hill Community Health Centre who support this study's research activities. The research team is especially grateful to the study participants who shared their experiences and gave so generously of their time and expertise. The authors would like to extend their appreciation to the following CCSA colleagues who contributed to developing and conducting this study: Sebastian Benavides, Nina Salazar, and Kelechi Obinna-Uguru.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Flynn PM, Brown BS. Co-occurring disorders in substance abuse treatment: issues and prospects. *J Subst Abuse Treat*. (2008) 34:36–47. doi: 10.1016/j.jsat.2006.11.013

2. Swendsen J, Conway KP, Degenhardt L, Glantz M, Jin R, Merikangas KR, et al. Mental disorders as risk factors for substance use, abuse and dependence: results from the 10-year follow-up of the National Comorbidity Survey. *Addiction*. (2010) 105:1117–28. doi: 10.1111/j.1360-0443.2010.02902.x

3. Lai HM, Cleary M, Sitharthan T, Hunt GE. Prevalence of comorbid substance use, anxiety and mood disorders in epidemiological surveys 1990-2014: A systematic review and meta-analysis. *Drug Alcohol Depend*. (2015) 154:1–13. doi: 10.1016/j.drugalcdep.2015.05.031

4. Compton WM, Cottler LB, Jacobs JL, Ben-Abdallah A, Spitznagel EL. The role of psychiatric disorders in predicting drug dependence treatment outcomes. *Am. J. Psychiatry*. (2003) 160:890–5. doi: 10.1176/appi.ajp.160.5.890

5. Weisner C, Matzger H, Kaskutas LA. How important is treatment? One-year outcomes of treated and untreated alcohol-dependent individuals. *Addiction*. (2003) 98:901–11. doi: 10.1046/j.1360-0443.2003.00438.x

6. Najt P, Fusar-Poli P, Brambilla P. Co-occurring mental and substance abuse disorders: a review on the potential predictors and clinical outcomes. *Psychiatry Res*. (2011) 186:159–64. doi: 10.1016/j.psychres.2010.07.042

7. Padwa H, Guerrero EG, Braslow JT, Fenwick KM. Barriers to serving clients with co-occurring disorders in a transformed mental health system. *Psychiatr Serv*. (2015) 66:547–50. doi: 10.1176/appi.ps.201400190

8. Spivak S, Cullen B, Eaton W, Nugent K, Spivak A, Fenton A, et al. Prescription opioid use among individuals with serious mental illness. *Psychiatry Res*. (2018) 267:85–7. doi: 10.1016/j.psychres.2018.05.075

9. Drake RE, O'Neal EL, Wallach MA. A systematic review of psychosocial research on psychosocial interventions for people with co-occurring severe mental and substance use disorders. *J Subst Abuse Treat*. (2008) 34:123–38. doi: 10.1016/j.jsat.2007.01.011

10. Canadian Centre on Substance Abuse. *Systems approach workbook: Integrating Substance Use and Mental Health Systems*. Ottawa, Canada: Systems Approach Workbook: Integrating Substance Use and Mental Health Systems (ccsa.ca (2013). Available online at: https://www.ccsa.ca/sites/default/files/2019-05/nts-systems-approach-integrating-substance-use-and-mental-health-systems-en.pdf.

11. Rush B, Fogg B, Nadeau L, Furlong A. *On the integration of mental health and substance use services and systems: Main report*. Ottawa: Canadian Executive Council on Addictions (2008).

12. Flexhaug M, Noyes S, Phillips R. *Integrated models of primary care and mental health & substance use care in the community*. Victoria: British Columbia Ministry of Health (2012).

13. Harris J, Dalkin S, Jones L, Ainscough T, Maden M, Bate A, et al. Achieving integrated treatment: a realist synthesis of service models and systems for co-existing serious mental health and substance use conditions. *Lancet Psychiatry*. (2023) 10:632–43. doi: 10.1016/S2215-0366(23)00104-9

14. Glover-Wright C, Coupe K, Campbell AC, Keen C, Lawrence P, Kinner SA, et al. Health outcomes and service use patterns associated with co-located outpatient mental health care and alcohol and other drug specialist treatment: A systematic review. *Drug Alcohol Rev*. (2023) 42:1195–219. doi: 10.1111/dar.13651

15. Milaney K, Haines-Saah R, Farkas B, Egunsola O, Mastikhina L, Brown S, et al. A scoping review of opioid harm reduction interventions for equity-deserving populations. *Lancet Reg Health Am*. (2022) 12:100271. doi: 10.1016/j.lana.2022.100271

16. Varcoe C, Browne AJ, Bungay V, Perrin N, Wilson E, Wathen CN, et al. Through an equity lens: illuminating the relationships among social inequities, stigma and discrimination, and patient experiences of emergency health care. *Int J Health Serv*. (2022) 52:246–60. doi: 10.1177/00207314221075515

17. Gilmer C, Buccieri K. Homeless patients associate clinician bias with suboptimal care for mental illness, addictions, and chronic pain. *J Prim. Care Community Health*. (2020) 11:2150132720910289. doi: 10.1177/2150132720910289

18. Jamal A, Salsberg A. *Operational guidelines for integrated mental health, substance use & Concurrent disorder service delivery*. Ottawa, Canada: Wisdom2Action for Mental Health Commission of Canada (MHCC) & Canadian Centre on Substance Use and Addiction (CCSA (2022).

19. Renard J, Hey B. *Substance use and mental health service provision: emerging themes from the academic literature (Scoping review 2018-2021)*. Ottawa, Canada: Mental Health Commission of Canada (MHCC) & Canadian Centre on Substance Use and Addiction (CCSA (2023).

20. CAPSA. *Experience and expertise of people with lived and living experience on the integration of mental health and substance use health services in Canada*. Ottawa,

Canada: Mental Health Commission of Canada (MHCC) & Canadian Centre on Substance Use and Addiction (CCSA (2023).

21. University of British Columbia. Equity and inclusion glossary of terms (2023). Available online at: https://equity.ubc.ca/resources/equity-inclusion-glossary-of-terms/ (accessed January 15, 2024).

22. ICHOM. *ICHOM standard set – addiction, Version 4.0 (Revised: April 23rd 2022)*. Boston: ICHOM (2022).

23. Alexander MJ, Haugland G, Lin SP, Bertollo DN, McCorry FA. Mental health screening in addiction, corrections and social service settings: validating the MMS. *Int J Ment Health Addict*. (2008) 6:105–19. doi: 10.1007/s11469-007-9100-x

24. EQUIP Health Care. *Rate your organization: 10 strategies to guide organizations in enhancing capacity for equity-oriented health care*. Vancouver, BC: EQUIP Health Care (2021). Available at: www.equiphealthcare.ca.

25. EQUIP Health Care. *Rate your organization: addressing anti-indigenous racism. A discussion tool*. Vancouver, BC: EQUIP Health Care (2022). Available at: www.equiphealthcare.ca. San'yas Anti-Racism Indigenous Cultural Safety Program.

26. EQUIP Health Care. *Rate your organization: harm reduction and reducing substance use stigma. A discussion tool*. Vancouver, BC: Community Addictions Peer Support Association (2022). Available at: www.equiphealthcare.ca.

27. EQUIP Health Care. *Rate your organization: 10 strategies to guide organizations in enhancing capacity for trauma and violence informed care (TVIC)*. Vancouver, BC: Gender, Trauma & Violence Incubator at Western University (2022). Available at: www.equiphealthcare.ca.

28. Browne AJ. Less talk, more action: Strategies to mitigate inequities experienced by indigenous peoples in the healthcare system. *Healthcare Papers (Toronto)*. (2023) 21:13–9. doi: 10.12927/hcpap.2023.27110

29. Varcoe C, Browne AJ, Perrin N, Wilson E, Bungay V, Byres D, et al. EQUIP emergency: can interventions to reduce racism, discrimination and stigma in EDs improve outcomes? *BMC Health Serv Res*. (2022) 22:1113. doi: 10.1186/s12913-022-08475-4

30. Substance Abuse and Mental Health Services Administration. *Dual diagnosis capability in addiction treatment toolkit version 4.0. HHS publication no. SMA-XX-XXXX*. Rockville, MD: Substance Abuse and Mental Health Services Administration (2011).

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 03 January 2025
DOI 10.3389/fpubh.2024.1460724

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Assis Kamu,
Universiti Malaysia Sabah, Malaysia
Rizwan Raheem Ahmed,
Indus University, Pakistan

*CORRESPONDENCE
Gazi Mahabubul Alam
✉ gazi.mahabubul@upm.edu.my

RECEIVED 06 July 2024
ACCEPTED 11 December 2024
PUBLISHED 03 January 2025

CITATION
Lei M, Alam GM and Bashir K (2025) The job performance and job burnout relationship: a panel data comparison of four groups of academics' job performance.
Front. Public Health 12:1460724.
doi: 10.3389/fpubh.2024.1460724

The job performance and job burnout relationship: a panel data comparison of four groups of academics' job performance

Miao Lei[1,2], Gazi Mahabubul Alam[2]* and Karima Bashir[2,3]

[1]Student Affairs Division, Yancheng Teachers University, Yancheng, Jiangsu, China, [2]Department of Foundation of Education, Faculty of Educational Studies, University Putra Malaysia, Serdang, Selangor, Malaysia, [3]Department of Education, Faculty of Education, Kebbi State University of Science and Technology, Aliero, Kebbi, Nigeria

Objectives: This present study investigates whether performance can influence job burnout, and it further examines whether there is a meaningful difference in the association between job burnout and job performance in universities. Provided here are applicable strategies aimed at preventing and maximizing job burnout crises before the job is taken and during its execution.

Methodology: To answer the research questions quantitatively, group regression analysis utilizing panel data from 2020 to 2023 was employed. The instruments include the KPI and mental health records to evaluate the level of job performance and job burnout. Likewise, a total of nine universities were purposively and randomly selected, and 1,113 academics were sampled for the study. The KPI scores and frequency of burnout counseling was collected from the human resource department and the medical health centers.

Findings: The results showed that academics' job burnout is influenced by their job performance ($\beta = -0.014$, $p < 0.001$). Academics' superior performance was notably linked to lower job burnout and the need for psychological counseling. Furthermore, academics' job burnout was significantly moderated by psychological counseling ($\beta = -0.006$, $p < 0.05$), and neither did it regulate their job performance.

Conclusion: Academics with high performance levels exhibit low levels of burnout. Meanwhile, academics who demonstrate low or poor performance indicate high burnout levels. Psychological counseling can moderate the level of job burnout but does not cure burnout. This study suggests that competency is the basic bedrock for strong performance and less burnout experienced by staff. Consequently, all universities should employ their staff based on assessing their competency and ability to handle stressful situations to prevent job burnout crises from occurring.

Implications: This paper makes a contribution to the existing literature on job performance and job burnout by utilizing a distinctive measurement path approach. In this context, universities need to use pre-measurement mechanisms to prevent burnout instead of post-measurement techniques through proactive recruitment strategies based on the popular adage that "prevention is better than cure."

KEYWORDS

China, job burnout, competence, measures, university academics, psychological counseling, job performance

1 Introduction

"Job burnout" as a concept is understood to be a multifaceted construct with multiple characteristics that are mostly connected to stress and work. Burnout is defined as a chronic condition and closely linked to a stress-related syndrome which results in emotional exhaustion, cynicism and depersonalization (1, 2). While studies on job burnout had their origins in social and historical perspectives, the subject has become more psychological over the centuries with greater emphasis being paid to medical experience and practices (1, 3). However, the research findings which revealed strategies and approaches to addressing job burnout to ensure staff members' wellbeing, ignited a surge of theoretical exploration in the areas of organizational administration and management and staff welfare (4).

1.1 Research motivation, significance and novelty

The higher education landscape has hugely changed due to the last few decades of the sector's internationalization and nations' investment in it, which has led to two important outcomes: firstly, increased demands on staff; and secondly, intensified pressures to deliver high-quality services (5). There is subsequently an increasing number of studies regarding the effective management of higher education and the courses or programs that are taught within it. For example, Parmar et al., Amer et al., and Watts and Robertson (6–8) have outlined what they believe to be the primary causes and reasons (such as, turnover intention, work overload, and inefficient management) for job burnout among academics. Asfahani and Lei et al. (9, 10) have observed the correlations between job burnout and higher education in role conflict, job autonomy and emotional job demands, and concluded that job characteristics wield a significant impact on burnout.

Several studies analyzed other predictors of burnout such as social support (11), employee turnover (12) and staff engagement (13), etc. Leiter, Maslach, and Liu et al. (14, 15) added the element of incompetence, which is thought to gravely impair employees' job performance. It is in fact the main cause of their job burnout, even though, they agreed with previous studies identifying the reasons for why job burnout occurred.

In order to address this persistent challenge, Maslach et al. and Nahas (1, 16) put forward some solutions to job burnout which include the following: adequate resource allocation, motivation and counseling, resilience, and balancing family, social, private and work life among others. Yet, the job burnout crisis remains unresolved with new cases emerging and increasing throughout the world. According to Blaskova et al. and Fazey and Fazey (17, 18), teachers, administrative staff and students in the university sector lack the essential skills, knowledge, and motivation needed to develop and effectively navigate their environment. If this is actually the case, the current recommended strategies for addressing job burnout may not be very effective, since higher education institutions are better off thinking more about pre-measurement strategies before burnout occurs, rather than considering post-measurement strategies after the job burnout crisis occurs. Subsequently, this study is motivated by exploring the ongoing challenges, aiming to delve into the scope of the problems and offer alternative strategies.

Studies have identified that job performance is predicted by job burnout, and the level of job burnout greatly influences the level of job performance (19). Unfazed by these findings, this study re-directed the path for the analysis and argued that staff members' performance should determine the level of burnout—a novelty of this research and a methodological contribution to future studies on job burnout. Whether there is a meaningful difference in the relationship between "job performance level" and "job burnout" is still a subject of much debate. Answers to these specific aims can significantly enhance the literature on job burnout by providing more details and perspectives on the issue. Similarly, this research contributes to the literature on this topic by providing solutions that can help to prevent job burnout among academic staff, thereby enhancing staff wellbeing and universities' effectiveness and efficiency.

This study has not only contributed by increasing the knowledge on job performance, but provided a mechanism for academic staff recruitment that can ensure sustainable high performance by all staff. Furthermore, the managerial implications of this research are not limited to universities, as staff of other institutions including non-educational sectors (such as health and social work) can also prevent job burnout by using these strategies. Moreover, the current research is empirical and quantitative in nature, comparing among various types of performance groups, and uses secondary data that are more reliable than perceptions of respondents (20). Thus, the questions that follow are intended to clarify these objectives:

(1) Can the academic staff members' job performance influence their job burnout?
(2) What strategies can be created to tackle job burnout crises experienced by academics?

The remaining sections are organized as follows: first, we provide the literature review, followed by an explanation of the research design and the data used in this study. After that, we will discuss our results before making substantial conclusions.

2 Literature review

2.1 The JD-R model

The JD-R model has been extensively implemented to interpret job burnout in a range of scholarly fields (3). Bakker and Demerouti (3) created the JD-R model in an attempt to understand the factors that lead to the problem of burnout. The model divides all job traits or characteristics into two groups: firstly, job demands and with job resources; and secondly, job resources which to some extent buffer the role of job demands in triggering job burnout. In this context, valuable job resources that individuals strive to acquire or maintain (increased job opportunities, colleague support) can reduce burnout, or buffer the link between job burnout and job demands. Current research strongly suggests that job performance can be viewed as a resource that individuals strive to obtain in order to produce expected results or minimize negative consequences such as burnout. Employees who care about the progress they are making in their career or ability to improve their day-to-day tasks, will seek ways to manage job pressure and resolve negative outcomes, striving to perform as best they can in

an effort to ensure their potential promotion or recognition for the work they do.

This study proposes that employees' job performance is a precursor rather than a result of job burnout, which helps to extend the research on job burnout. Due to previous research mainly focusing on identifying sources of job pressure and recommending the usage of organizational resources to mitigate employees' experience of job burnout (3), this study establishes guidance for academics to seek personal answers (rather than organizational answers) to address burnout. The following section introduces the relevant literature and formal hypotheses.

2.2 Job burnout in higher education

For nearly 50 years, job burnout has been extensively studied as a multi-dimensional construct closely linked to on-going work-related stress (1). Maslach and Leiter (2) defined it from a psychosocial perspective; they claimed that it is a chronic stress syndrome characterized by depersonalization or cynicism, emotional exhaustion, and a much reduced sense of personal accomplishment/achievement or efficacy.

In recent decades, academics in higher education worldwide have faced growing demands, including increased pressure to publish in journals, achieve high rankings, secure tenure, and maintain excellence in teaching and supervision. These pressures have increased the cases of academics' burnout. The number of academics has expanded significantly as a consequence of the development of mass higher education systems and frameworks in emerging nations; figures show that between 1980 and 2018, the number of academics increased by about 9 million (21). Watts and Robertson (8) contended, however, that an increase in quantity often differs from the increase in quality. Furthermore Amer et al. (7) opined that there are persistent job burnout crises in universities due to a lack of competency.

China offers a noteworthy example of how its higher education system has changed over the last few decades. Since 1999, the nation has experienced a swift transformation of its university sector, evolving from an elite model to one of mass participation (22). From 2000 to 2021, the number of universities expanded from 1,000 to 2,756, and the academic staff grew from 0.46 million to 1.87 million. This shift resulted in China becoming of the world's countries with the world's largest education population. In this context, it is essential to examine what has caused the wave of burnouts in China's vast higher education sector. It is also important to identify precautionary measures that could mitigate burnout, ultimately enhancing university management.

2.3 Job performance in higher education

In higher education, "job performance" encompasses all employee responsibilities and behaviors that carry an expected value, whether positive or negative. This speaks to employees' performance of their jobs and conduct at work (23). Therefore, the performance of all employees as a whole determines how well the university functions (24) and universities evaluate employee performance and reward roles and good behaviors associated with excellent instruction as well as organizational regulations (25, 26).

For assessing job performance, the Key Performance Indicator (KPI) model is now the most widely recognized approach (27). According to this approach, staff duties are divided into micro-units, each of which has goals and a score. Numerous stakeholders are involved in the scoring process, which assigns points based on both quantitative and qualitative factors in a hierarchical sequence (27). Despite criticism as a "numbers game," the KPI model is employed throughout the world by higher education institutions (28), including China.

In China, the KPI result is a combination of self-reports (i.e., subjective measures) and supervisor/colleague ratings (i.e., objective reports), wherein the reported association between different sources of performance assessment refers to two mentioned stakeholders to reflect fairness (29). Each academic has to submit his/her self-evaluation based on their KPI completion status, such as teaching, research, publications, social services, virtues, and management roles. Each item has a detailed score, with the highest score considered excellent and the lowest score deemed to be unqualified. Based on the meetings' outcome, the supervisor/head of the academics or chairperson will make a final assessment and evaluation. This task is usually summarized by the personnel or human resources departments of each university at year's end.

Prior to the KPI, how well the employee performed was evaluated using the Individual Work Performance Questionnaire (IWPQ) (30) and the Annual Compensation Review (ACR) (31). The IWPQ was developed to address the limitations of ACR, but it also could not capture the realities of the staff performance, and it failed to give account for the differences in hierarchical levels. The fundamental theoretical performance test may not accurately reflect reality or what their duty statements required, which is another reason the IWPQ failed (32). Meanwhile, ACR was condemned due to its biases (nepotism, prejudice, favoritism) and being influenced by managers who play a crucial role in evaluating staff members' performance using descriptive analysis that was based on job descriptions (30).

A search was undertaken in the Web of Science core collection using the term "key performance indicators," and it resulted in a total of 20,780 articles. Cozzani Valerio and Anil Kumar, as experts in this field, have H-indices of 49 and 43, respectively. In the study, papers emphasize the importance of KPI in the development process of enterprises, due to its flexibility and efficiency, and gradually transitions to use in universities. In recent years, more than 3,000 papers have been published on the application of KPIs in higher education. Furthermore, there are 242 articles on ACR and 5,248 articles on IWPQ, respectively. Consequently, for the purposes of this study the KPI model score which is currently the mainly official performance measurement method used in China for appraising academics' job performance will be utilized.

2.4 Job burnout and job performance

The term burnout has now enjoyed methodological and conceptual analysis recognition and legitimacy for more than half a century. The approach that dominated the 1970s was mainly qualitative, employing narrative and phenomenological approaches aimed at predicting the cases of "job burnout" (3, 33, 34). Later, studies conducted in the 1980s employed a quantitative approach, testing probable hypotheses and analysis models to predict job burnout (1).

Currently, comparative study of burnout and non-burnout groups and correlational/causal links between burnout and other factors strongly imply there is a negative relationship between job performance and job burnout. The scholarly literature on job burnout has been dominated by this relationship in recent decades. Similarly, some research is conducted using mixed methods (combining qualitative and quantitative approaches). One critique/limitation of this strategy is that it has always typically been used to study job burnout and their job performance in the workplace, and a call for new approaches has been made (1, 35).

Leiter, Maslach, and Lei et al. (14, 36) also raised concerns that job burnout could be predicted or affected by individuals' performance. Poor performance as an after-effect of job burnout may have been erroneously documented by the relevant literature (1, 19). To achieve this, "job burnout" served as the independent variable while "job performance" became the dependent one. The focus of this study is to create a new paradigm by examining the link between the dependent variable, i.e., job burnout and the independent variable, i.e., job performance (see Figure 1).

As a result, job burnout is a consequence of their performance. To determine whether job performance affects job burnout, a comparison will be made among different job performance groups, while controlling for factors contributing to burnout.

> Ha1: When all predictor factors are included, the "job performance" of academics has a significantly negative effect on "job burnout."

The World Health Organization's (WHO) has defined burnout as a workplace illness that can lead to potentially fatal medical disorders including depression and cardiovascular disease (37). Similarly, medical treatments and psychological therapy were suggested by the World Health Organization (38) as the approved methods for treating job burnout in the workplace. However, techniques adhering to the "prevention is better than cure" motto (4, 39), were not duly respected. Hence, this research hypothesizes that:

> Ha2: When all predictor factors are included, academics' "job performance" and their "job burnout" are significantly moderated by "psychological counseling."

The group's academic performance was assessed to support the claim that having employees who are more competent reflects their ability to be resilient to job burnout when all predicted factors connected with job burnout are taken into account. It is therefore important to ensure that highly competent staff are recruited as a preventative measure against potential job burnout issues and to use psychological counseling as a treatment for burnout. This study will investigate whether implementing these preventive and supportive measures significantly reduces job burnout.

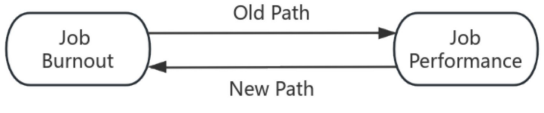


FIGURE 1
Indicating old path and proposed path.

3 Materials and methods

3.1 Research design

This quantitative study is a correlational design, which has undertaken a diversification and rerouting of data and their analysis compared to the recent research conducted by Lei et al. (36, 40). In doing so, the study has accumulated a panel dataset to explore the association between job performance and academic staff members' burnout in universities. Using a panel dataset for analysis offers both time-series and cross-sectional data, which serves to enhance the richness and diversity of the dataset. According to Maslach et al. (1), there are numerous antecedents influencing job burnout, making it impossible for this study to list all control variables. Panel data with the fixed effect model (41) makes it possible to observe changes that occur within the same group of staff at different periods and control for individualistic heterogeneity, which means controlling for unobserved time and distinct characteristics that may affect the results. This would provide more accurate analysis results. Based on the model, it is suitable for variables at different analysis levels (i.e., universities, regions) in multi-level or hierarchical modeling, which is relevant to the sampling introduced below. According to Hsiao (42), this method is better suited for detecting dynamic hierarchical relations between variables, uncovering causal links and long-standing effects.

In addition, to identify the best model, *F*-test was employed to find out if the fixed effect model is superior to the pooled regression model. According to Table 1, the *F*-test result shows $p = 0.000 < 0.05$, meaning that the fixed effect model is preferred over the pooled regression model. To ensure the accuracy of the fixed effect model and eliminate estimation bias caused by multicollinearity among variables, a multicollinearity test was conducted. If any VIF value exceeds 5 or the Tolerance value is less than 0.1, a multicollinearity issue is indicated. According to Table 2, all VIF values are less than 2, and all tolerance values are greater than 0.1. This strongly suggests that no multicollinearity problem exists among the variables and that the model estimation results are valid.

3.2 Measures

The data obtained from the selected universities include both demographic information, KPI results, and burnout records as well as the receiving of psychological counseling, all belonging to the same respondents. "Processed" secondary data also known "treated data" was collected from selected institutions with the assistance of the head of the human resources department or their assistant, which is considered more reliable than survey responses for the first study in its kind in China. Therefore, since the data exists as processed secondary data, the sampled universities are responsible for the data and therefore no reliability and validity testing has been conducted.

3.2.1 Control variables

Individual characteristics of the participants (age and gender) and work-related factors (years of employment) with established associations with job burnout (43, 44), are identified and controlled.

TABLE 1 *F*-test.

Type	Objective of the test	Test value	Test conclusion
F-test	The comparison between the fixed effect model and the pooled regression model.	$F(1{,}112, 2{,}225) = 1.244$, $p = 0.000$	The fixed effect model

TABLE 2 Collinearity test.

Variables	VIF	Tolerance
Job performance	1.001	0.999
Gender	1.000	1.000
Age	1.000	1.000
Years of employment	1.001	0.999

VIF, Variance Inflation Factor.

TABLE 3 Tools and their measurements.

Variables	Tools/ instruments	Domains
Independent variable Job performance	Key Performance Indicator (KPI)	Non-performance-1 Low performance-2 Average performance-3 High performance-4
Moderating variable Psychological counseling	Mental Health Centre records	Non-psychological counseling-1 Monthly Sessions-2 Bi-Weekly Sessions-3 Weekly Sessions-4
Dependent variable Burnout	Mental Health Centre records	Non-burnout-1 Low burnout-2 Moderate burnout-3 High burnout-4

3.2.2 Job performance (KPI) tool

The job performance of the academics was determine using KPI. The KPI helped to evaluate how well the academics did their work. It is compulsory for universities in China to utilize specific KPIs that will guide the ranking of staff members' job performance. Some specific details of the KPI measurement items include teaching, research, publications, social service, virtue and managerial roles. This process is based on the national policy (45). Another policy (46), in general, according to the quantity, quality, timeliness, and cost of completed work, as well as the resulting social and economic benefits, the academic achievement is divided into four categories: non-performance which also refers to unqualified, low performance also known as basically qualified, average performance which is termed as qualified, and finally high performance which is conceptualized and graded as excellent. If academics achieve the performance tasks for the current year, they are considered to be qualified. Exceeding these performance tasks will result in an evaluation of excellence. Conversely, failure to meet the performance standard will lead to a rating of either basically qualified or unqualified.

3.2.3 Psychological counseling tool

Each institution's Mental Health Centre supplied additional data on psychological counseling. Concurring to health policy (47), all universities and higher education institutions are mandated to often provide academic staff with psychological health care, psychological assessments, and related/extended services. Universities will offer psychological treatment at the proper frequency based on the burnout results. Table 3 provides specifics on the measures.

3.2.4 Burnout level tool

The data for measuring burnout level was adopted. This data was obtained first-hand from the Mental Health Center of each selected institution sampled for this research. The health centers used various burnout instruments and tools such as the burnout inventory scale by Maslach (1), Oldenburg (48), Copenhagen (49) and many more. This depends on the preference, rationale and justification of the health center personnel/professionals to determine whether an academic is burned out or not. Similarly, they used their clinical processes to categorize academics based on their burnout level. The research used a scale to categorize burnout levels into four distinct classes so that the extent of academics' burnout could be documented. Thus, no reliability and validity test were performed since the data is secondary data.

3.3 Data collection method

This study was conducted between January 3 and June 13, 2024. All participating academics were required to be actively working between 2020 and 2023 to highlight their multi-year career trajectories. Exclusion criteria applied to those who failed to participate in the KPIs or missed a KPIs during the 2020–2023 period. Therefore, the academic staff who had were absent or retired were excluded from the study. This strict selection criterion helps ascertain the research findings' reliability and validity.

The secondary data was collected through sampled universities. The first author approached the sampled universities and explained the study's goal to the appropriate authorities and the specific data being requested. Prior to conducting the official visit, the research team got an ethical approval from one university with reference number: JKEUPM-2023-676, wherein the concerns regarding the safety aspects of the research had been addressed. Afterwards, authorization was acquired from every university and the institutions approved and the researchers were furnished with a reference number (YCTU20221017). The universities chosen were subsequently informed that participating for them was optional, and furthermore they have the freedom to withdraw from the study at any point.

In order to ensure that all participants' details remained confidential, we allocated number codes in a sequential manner, commencing with the initial sample from the list. Since the data obtained from the sampled universities identified the respondents as 1, 2, 3, 4, 5, 6 and so on, all the volunteers' personal information remained anonymous and not disclosed to the authors. Moreover, letters of the alphabet starting from A were allocated to the universities in a sequential order, based on the list of the universities. For example, the code assigned to respondents from university A, B, C, D and so on. For the universities, we utilized A1, A2, or B1, B2, and other similar designations, and pseudonyms were used for all the selected samples from the institutions.

3.3.1 Population and sampling

The entire academic staff in all the universities were utilized as the population of this research. Since the population is composed of many subgroups that may differ in the characteristics being studied, a probability sampling method known as stratified random sampling is often necessary. This sampling method allows for better coverage of the population and ensures that each subgroup in the population is appropriately represented in the sample (50). To leverage the advantages of the fixed effect model (40), this study stratifies academics based on region and university type.

While earlier published studies, such as that of Lei et al. (36, 40), limited their samples to a developed province in China, this research encompasses a nationwide sample, significantly expanding the scope. This expanded sampling improves the generalizability and relevance of the findings, providing additional support for the earlier results of published studies. The "Seventh Five-Year Plan" which was adopted by the Fourth Session of the Sixth National People's Congress (51), divided China into three districts—western, eastern and central. The total universities in each district according to the Ministry of Education of China are in 2023 are as follows: Eastern district has 1,164 universities; Central district has 1,034 universities and Western district has 622 universities. However, in each district, based on the countries policy, universities can be categorized into three types: double World-Class universities, vocational colleges, and ordinary universities (52). Therefore, triangulation was ensured by selecting one institution from each type of university in each region, utilizing the simple random sampling method (50). To ensure each university has an equal opportunity to take part, Microsoft Excel was used to select sampled universities randomly (53). As a result, nine universities were selected, one from each type of university, totaling 3 universities from each district.

The complete number of academics in the three eastern universities are 3,371, 1,680 and 643 for double World-Class universities, ordinary universities and vocational colleges, respectively, and the total number of academics for the eastern district amounts to 5,694. Meanwhile, the total number of academics from the central district in each of the three universities—World-Class universities, ordinary universities and vocational colleges, respectively, are 3,512, 1,160 and 658. The total number of academics from the central districts amounts to 5,330. Lastly, the academics from the western district in World-Class universities total 2,683, while the ordinary universities academics are 1,448 and the vocational academics are 521, therefore totaling 4,652 academics from the western district. As such, 16,076 academics serve as the total population of interest for the research. Thus, to determine a sample size to represent each district, we apply the Yamane (54) sampling size formula as follows:

$$n = \frac{N}{1 + N(e)^2}$$

where n represents sample size, N denotes the total number of academics, and e stands for the significance level or the level of precision. Under normal circumstances, we assume that the precision level is 5%. The results indicated that the sample size for the total number of academics in each district is 373 from eastern district, 372 from central district, and 368 from western district. Subsequently, based on the total number of academics in each sampled university, a proportional allocation is conducted using stratified sampling techniques (42) with simple arithmetic (Sample size in each university = Total academics in each university × Sample size in the district ÷ Total academics in the district). This made it possible to select a specific number of respondents from each university.

Finally, the personnel or HR departments of chosen institutions helped in the random selection of academics for the study, using a method that entailed choosing every fourth person's name on the list. The aforementioned scholars served both purposes of data gathering and analysis. The samples were chosen at random and then categorized into four groups depending on the academics' 3-year performance records of panel data: non-performance; low; average; and high. This strategy helped to avoid sampling bias and warranted a random mirror/picture of the job performance groups currently available in universities, as shown in Table 4. Table 5 presents the individual features of the selected sample.

TABLE 4 Sampling and sample observation grouping.

District	University type	Total A.	Sample A.	High P.O.	Average P.O.	Low P.O.	Non-P.O.	Sample A.O.
Eastern	Double World-Class university	3,371	221	117	216	178	152	663
	Ordinary university	1,680	110	65	119	79	67	330
	Vocational college	643	42	24	46	30	26	126
Central	Double World-Class university	3,512	245	136	249	190	160	735
	Ordinary university	1,160	81	51	75	48	69	243
	Vocational college	658	46	29	50	27	32	138
Western	Double World-Class university	2,683	212	93	205	161	177	636
	Ordinary university	1,448	115	58	112	82	93	345
	Vocational college	521	41	23	42	35	23	123
Total		16,076	1,113	596	1,114	830	799	3,339

N = 1,113; Total A. = Total academics; Sample A., Sampled academics; High P.O., High performance observations; Average P. O., Average performance observations; Low P. O., Low performance observations; Non-P. O., Non-performance observations; Sample A.O., Sampled academics observations.

TABLE 5 Samples' demographic profiles.

Control variables	Number	Percentage %
Gender		
Male	532	47.8
Female	581	52.2
Age		
35 or below	284	25.52
36–45	279	25.07
46–55	257	23.09
56 or above	293	26.32
Years of employment		
5 or less	151	13.57
6–10	157	14.11
11–15	171	15.36
11–20	163	14.65
21–25	159	14.28
26–30	159	14.28
31 or above	153	13.75

$N = 1{,}113$.

3.4 Data analysis techniques

Based on the suggestion made by Ahmed et al. (55), SEM is a dominant multivariate technique that can analyze relationships among latent variables and multiple manifest variables, which is helpful in practice, such as in the psychology and management vocations. However, this study processed the relationships between variables by collecting "processed" secondary data (also known as treated data), which does not have latent variables. Specifically, burnout level is an ordered categorical variable, while performance level is a continuous variable, both of which are directly observed without involving complex structures or measurement errors of latent variables (56). Therefore, as suggested by Gordon (57) when dealing with processed data from the secondary treatment panels (especially treated data), multiple regression analysis can help identify key factors that affect the dependent variable and establish predictive models. Furthermore, in order to study the relationships between variables, this study divided respondents into different groups, and group regression will provide the level of significance among the different groups. Convenience for the research, the need for control variables, and the complexity of moderating roles, data are analyzed using a multiple regression model (58).

A multiple regression analysis was undertaken on research question one (RQ1) and the first hypothesis (Ha1), exploring the relationship between job performance and job burnout while taking into consideration temporal and individualistic factors. Group linear regression was used to: (1) ascertain the specific nature of the link between job burnout and their job performance and; (2) prevent mistakes from being introduced based on the heterogeneity of samples. With four job performance observations based on panel data, this made it easier to see how job performance affected job burnout. To bolster the findings of RQ1, performance groups were compared based on the extent of burnout after 3 years.

In order to respond to Ha2, psychological counseling is first evaluated using hierarchical linear regression. This is done to find out if it has a substantial bearing on their job "burnout" and if it acts as a moderator between "job burnout" and their "job performance." Four types of performance measurements were employed in group regression analysis to validate the first step's conclusion and prevent sample heterogeneity errors. This was done in an effort to ascertain whether the four types of job performance are moderated by psychological counseling. Moreover, the effect of psychological counseling on "job burnout" and performance group comparisons based on psychological counseling frequency over a three-year period were discussed. The key purpose of this was to examine the RQ2 results in conjunction with the findings of earlier regression analyses. The analysis was done employing version 18 of the Stata software package. Table 6 outlines the research questions, methodology, and assumed hypotheses in detail.

4 Results

The results are presented sequentially based on the stated research questions.

4.1 Job performance impacts burnout among academic staff or academics and the impact of their performance on burnout

The outcomes of the panel data (Table 7) in 3-year observations reveal there is an inverse link between academics' performance and their job burnout ($\beta = -0.014$, $p < 0.001$), even after adjusting for temporal and individual variables. Thus the results validate Ha1.

In order to provide additional evidence for Ha1, the different types of performance were subjected to a group regression analysis,

TABLE 6 Research questions and analysis techniques.

Research questions	Hypotheses	Methodology	Analysis
Does job performance influence job burnout among academic staff?	Ha1: When all predictor factors are included, the "job performance" of academics has a significantly negative effect on "job burnout."	Quantitative	Linear regression, frequency trends
How can a mechanism be developed to address job burnout crises among academics?	Ha2: When all predictor factors are included, academics' "job performance" and their "job burnout" are significantly moderated by "psychological counseling."	Quantitative	Linear regression, frequency trends

principally to evaluate the extent to which performance level affects job burnout. Table 8 summarizes the results, displaying a substantial and clear inverse association between job burnout and academics' performance across the four types of performance observations based on the selected 3 years data.

The study's aims is two-fold: first, to determine whether job performance and burnout are inversely correlated; second, to reinforce the regression analysis findings that indicate job performance impacts burnout by demonstrating that academic staff with consistently high performance tend to experience low levels of job burnout. In contrast, the non-performance academic observation group—as shown in Figure 2—consistently displays high amount of job burnout.

TABLE 7 Influence of job performance on job burnout.

Variables	Overall
Gender	−0.061
	(0.043)
Age	0.013
	(0.019)
Years of employment	−0.007
	(0.011)
Job performance	−0.014***
	(0.001)
Constant	2.266***
	(0.125)
Observations	3,339
R-squared	0.043
Individual fixed effect	YES
Time fixed effect	YES

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

TABLE 8 Influence of job performance on job burnout among four sampled observation groups.

	High P.O.	Average P.O.	Low P.O.	Non-P.O.
Gender	−0.171	0.018	−0.066	0.229
	(0.169)	(0.079)	(0.108)	(0.127)
Age	0.028	0.052	−0.023	−0.073
	(0.065)	(0.036)	(0.057)	(0.058)
Years of employment	0.017	−0.031	−0.036	0.015
	(0.039)	(0.020)	(0.026)	(0.032)
Job performance	−0.225***	−0.114***	−0.226***	−0.101***
	(0.027)	(0.007)	(0.020)	(0.010)
Constant	22.626***	10.395***	16.197***	6.377***
	(2.573)	(0.576)	(1.294)	(0.574)
Observations	596	1,114	830	799
R-squared	0.426	0.490	0.422	0.381
Individual fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$; High P.O., High performance observations; Average P. O., Average performance observations; Low P. O., Low performance observations; Non-P. O., Non-performance observations.

4.2 Job burnout: the function of psychological counseling as a moderator

In the exploration of the moderating impact of psychological counseling on academics who suffer from job burnout, psychological counseling emerges as significantly alleviating the burnout problem. After accounting for the time and individualistic effects, no control factors significantly influence burnout in the initial analysis block. Nevertheless, in the second analysis block, where job performance is included, it has a significant negative effect on predicting burnout ($\beta = -0.008$, $p < 0.001$). The third analysis block reveals that psychological counseling wields a strong negative effect on job burnout ($\beta = -0.172$, $p < 0.001$).

In the analysis Block 4, the interaction between psychological counseling and job performance is observed to greatly determine job burnout ($\beta = -0.006$, $p < 0.05$). As well, Table 9 shows that the relationship between job performance and job burnout is significantly and negatively moderated by psychological counseling.

Furthermore, the analysis made through the group regression shows that their psychological counseling has a moderating effect on the low ($\beta = -0.125$, $p < 0.05$) and non-performance ($\beta = -0.054$, $p < 0.05$) observation groups after accounting for academics who failed to go to psychological counseling sessions in any of the 3 years (presented in Table 10). Meanwhile in the average performance observation groups ($\beta = 0.001$, $p > 0.05$) and high-performance observation groups ($\beta = -0.004$, $p > 0.05$), there is no moderating impact. Hence, there is a noticeable difference between the non-performance, low, average, and high-performance groups. This is particularly the case when discussing the extent to which job burnout is moderated by psychological therapy. The outcomes validated Ha2.

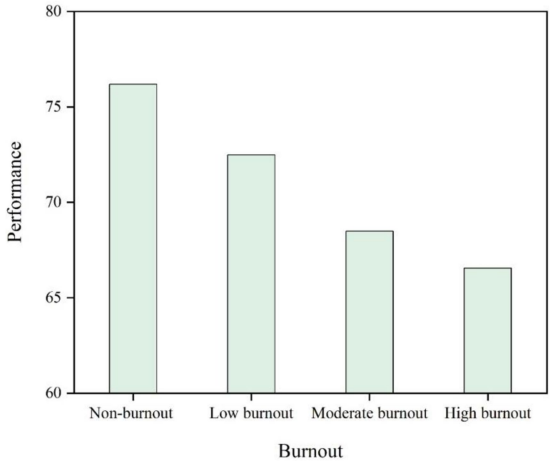


FIGURE 2
The 3 years comparison of academics' job performance with dissimilar burnout status.

10.3389/fpubh.2024.1460724

TABLE 9 Moderating role of psychological counseling on the influence of job performance and job burnout.

	Block 1	Block 2	Block 3	Block 4
Gender	−0.048	−0.053	−0.043	−0.046
	(0.044)	(0.044)	(0.044)	(0.044)
Age	0.024	0.021	0.023	0.020
	(0.020)	(0.020)	(0.020)	(0.020)
Years of employment	0.004	0.003	0.004	0.003
	(0.011)	(0.011)	(0.011)	(0.011)
Job performance		−0.008***		−0.008***
		(0.001)		(0.001)
Psychological counseling			−0.172***	−0.143**
			(0.045)	(0.045)
Job performance *psychological counseling				−0.006*
				(0.003)
Constant	1.659***	2.271***	1.752***	2.304***
	(0.076)	(0.124)	(0.080)	(0.124)
Observations	2,541	2,541	2,541	2,541
R-squared	0.002	0.028	0.013	0.038
Individual fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

TABLE 10 Moderating role of psychological counseling on the influence of job performance and job burnout among sample observation groups.

	High P.O.	Average P.O.	Low P.O.	Non-P.O.
Gender	0.416	−0.243	−0.314*	0.101
	(0.243)	(0.163)	(0.153)	(0.136)
Age	0.423*	0.031	−0.102	−0.027
	(0.162)	(0.069)	(0.094)	(0.079)
Years of employment	−0.136	−0.015	−0.032	0.074
	(0.100)	(0.036)	(0.035)	(0.046)
Job performance	−0.152*	−0.084***	−0.162***	−0.112***
	(0.057)	(0.016)	(0.026)	(0.013)
Psychological counseling	−0.317	−0.038	−0.563**	−0.194*
	(0.213)	(0.089)	(0.180)	(0.181)
Job performance *psychological counseling	−0.004	0.001	−0.125*	−0.054*
	(0.002)	(0.001)	(0.061)	(0.023)
Constant	17.062*	8.361***	12.561***	7.378***
	(5.527)	(1.238)	(1.655)	(0.808)
Observations	266	477	353	301
R-squared	0.803	0.580	0.740	0.847
Individual fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$; High P.O., High performance observations; Average P. O., Average performance observations; Low P. O., Low performance observations; Non-P. O., Non-performance observations.

The researchers used longitudinal data analysis, as shown in Figure 3, to guarantee accuracy and determine psychological counseling's moderating influence on their job burnout among the different performance observation groups. The trend is shown from 2020 to 2023. In addition, compared to non-attendees, academics who received psychological counseling displayed reduced levels of burnout.

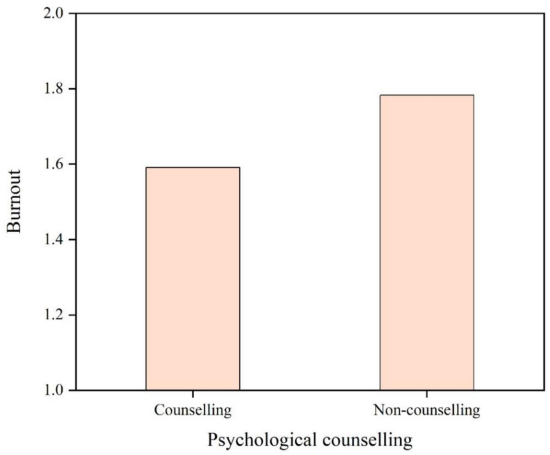


FIGURE 3
The 3 years (2020–2023) comparison of the role of psychological counseling on job burnout.

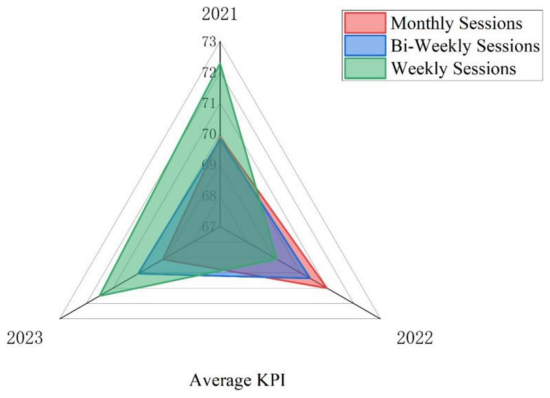


FIGURE 4
The 3 years (2020–2023) comparison of academics' KPI performance based on their frequency of psychological counseling.

Likewise, the findings in Figure 4 indicate that academics' job performance stayed unaffected by the amount or quantity of psychological counseling sessions and interventions performed. This suggests that even though psychological therapy may assist to alleviate academic fatigue, it does not influence job performance.

5 Discussion

5.1 The association between job-performance and job burnout

According to research by Amer et al. (7), in order to avoid burnout, academics who are highly motivated and productive have a tendency to take proactive steps to address various stressors in their workplace. Contrarily, those who find it difficult to work effectively are more prone to burnout due to their failure to meet job demands (9). Consistent with previous studies by Lei et al. (36, 40), this research found that job performance remains a significant predictor of job burnout, even when controlling for time and individual factors using panel data.

Furthermore, as academics work to improve their performance, they gain greater expertise in their roles and accomplishments. This can result in personal rewards, including promotions within the organization or recognition for their job excellence (44). These findings support the idea that performance can be likened to one of the valuable resources that employees strive to obtain, with the intention to generate better outcomes and ensure less, diminished or preferably no burnout. In this case job performance is the source of the potential reward and a driver of positive outcomes. Employees who strive to do their duties or tasks well are endeavoring to overcome various job stressors in the workplace and therefore avoid burnout. This is consistent with the findings in Bakker and Demerouti (3) who created the Job demands-resources model.

On the other hand, in the Job demands-resources model (3), reducing the impact of job demands and improving the level of job resources can minimize job burnout in the workplace to the greatest extent possible. Research has shown that a decline in job performance can lead to many poor outcomes, such as emotional exhaustion (59), and diminished personal achievement (60), both of which are important dimensions of job burnout (3). Therefore, after becoming an academic, job performance plays a significant role in improving job resources and reducing job demands.

5.2 Impact of psychological counseling as a procedure for treating their burnout: utilizing post-cautionary or pre-cautionary measurement

Psychological counseling as a post-measurement has been shown to be useful in minimizing job burnout, as revealed by the results of this study. This finding generally agrees with previous literature on the efficacy of psychological counseling in mitigating job burnout across various contexts (39, 40). In addition, the results provide concrete proof that psychological counseling wields a mitigating impact on both non-performing and low performance groups.

The association between job performance and their job burnout of the average and high-performance observation groups is not mediated by psychological counseling. This is predicated on the discovery pertaining to RQ1, which implies that academics who underperform are more susceptible to burnout and more inclined to seek support through counseling services, as a consequence. In contrast, people who perform well typically experience far less burnout. Consequently, there is no longer a need for psychological counseling assistance. Consequently, the importance of psychological counseling as a subsequent approach to addressing their job burnout concerns continues to be significant.

Moreover, the correlation between job performance, psychological counseling, and job burnout as shown by this research study suggests that persons who are suffering from burnout may suffer from recurring attacks. Even if they seek to alleviate burnout through psychological counseling. It is important to acknowledge that while psychological counseling may alleviate burnout, as indicated by previous studies (39, 40) and in these results, it cannot enhance performance. Consequently, academics might become caught in a

repetitive pattern where poor performance leads to frequent burnout and situations wherein the outcome of job demands prove to be pervasive, such as stress and emotional exhaustion (3). As academic personnel, relying solely on post-measurement for their job burnout therapy in one's career may not be sufficient to achieve a permanent cure and may in fact lead to various onerous job demands. For this reason it is crucial to examine and highlight the significance of pre-measurements.

6 Theoretical and practical implications

The findings contribute to the existing literature on the research of job burnout by exploring how the relationship between academics' job performance and their burnout affects different levels of teaching staff, offering practical insights. Firstly, this research contributes significantly to the area of job burnout studies by expanding upon existing knowledge and presenting a fresh perspective on the topic. The theoretical contributions made by this study are both legitimate and substantial. Secondly, while most research typically focuses on reducing employee burnout to improve academics' performance (61, 62), this study introduces a novel methodological approach to explore the relationship between these two variables.

In a period marked by the rapid expansion of higher education, there is a common misconception, particularly in developing nations, that being employed as academics entails a much easier workload and minimal dedication to their profession (63). This assumption and attitude should be completely dismantled before and subsequent to when an employment contract begins. Based on this, the notion that "prevention is better than cure" should be acted on, as suggested by Kennedy (64). However, in most universities the academic recruitment processes which are so important for their viability have either ignored, underestimated or paid little attention to this adage, and this helps to explain why there is much scholarly debate or discussion on higher education and examples of job burnout (65). Consequently, in order to reduce academics' job burnout after receiving a contract, it is recommended to create proactive recruitment strategies for academics as a preventive strategy. It should function in such a way to mitigate their job demands in the workplace, increase job resources, and detect any signs of job burnout crisis that can then be dealt with. Essentially, universities should prioritize hiring academics who exhibit good to excellent competency, resilience to stressful situations and high job performance in a fair performance evaluation system so that symptoms of burnout are prevented.

On the other hand, since counseling is not primarily intended to enhance job performance, it does not inherently result in skilled, revitalized, motivated, enthusiastic, and proficient staff. Based on these discoveries, it is recommended to evaluate the cognitive, educational, and psychological aspects of potential employees in addition to comprehensively assessing the abilities of all applicants at the human resources recruitment process. Put differently, if universities desire to hire capable, self-driven, mentally strong and enthusiastic individuals who are prepared to work as academics, it is imperative for their recruitment procedures to include psychological counseling examinations so that the applicant's competency skills can be thoroughly assessed.

Applicants must undergo a thorough evaluation to determine their capacity for intense and diligent labor. Additionally, their psychological fit for the academic role should be analyzed by examining their motivations, passions, and determination. After recruiting the right individuals, strategies for ongoing professional development that include both academic and psychological components must be established. Research has shown that learning opportunities—as one of the important job resources—can buffer job demands, such as one of the dimensions of job burnout-emotional exhaustion and reduce job burnout (66). This will equip them with the essential skills to effectively adapt to the ongoing transformations within the higher education system, especially in response to the swift technological advancements currently taking place. Additionally, the university administration division ought to enhance its training initiatives with the goal of enhancing staff members' performance and competence. This involves identifying skills gaps and promoting mental wellbeing among staff members.

7 Limitations and future studies

While this analysis deployed a novel approach to assess the impact of job burnout on staff members' performance, it did have some limitations. Initially, this study suggested that psychological assessments should be incorporated into recruiting processes, however, it did not specify the specific psychological criteria to be employed in these assessments. Furthermore, although panel data is sampled and used throughout China, the applicability of the results may be limited solely to that country, potentially limiting the applicability of its findings to other nations. Furthermore, studies can explore mediating and moderating variables in the hypothesized association between performance and burnout. This will further enhance the robustness of the measurement method/path, and it could lead to interesting findings.

To attain a more inclusive and generalizable understanding of the influence of job burnout, further research could broaden the inquiry to diverse contexts and a replica of this study can also be conducted in private universities due to the dynamics of their organizational management. It should be noted that this study utilized secondary data for its analysis. This study used processed (treated) secondary data from the treatment panel at the secondary sources; it therefore furthered processing them with AMOS for the usage of SEM, which was rather restricted. However, this research made a gateway developing pathways and variables for future research. Hence, future research can collect primary data to test the correlation between job performance and burnout by using the Structural Equation Modeling. Likewise, other statistical methods and packages such as AMOS, SPSS can be used to investigate the data.

8 Conclusion

The recent research done in China by Lei et al. (35, 39) is not inherently refuted by this study. What it does do is supplement and complement a wider nationwide dataset by adopting a distinct form of analysis. Moreover, the results and analysis discussed in this paper have considered a multifaceted view to draw a conclusion that is comparable to the studies conducted recently. Nevertheless, the

research results indicate that in academic environment, academics' burnout is influenced by their performance. It is obvious that academics' competence deserves more attention, as the operations of universities rely heavily on academics' expertise and ability to do their job, such as teaching, administrative tasks dealing with their subjects, and research. By ensuring personal abilities and enhancing individual performance to reduce job burnout, pre-measurement can be used instead of post-measurement, because the former will benefit the stability of academic staff. In addition, since psychological counseling moderates the relationship between job performance and job burnout, the research findings confirm that psychological counseling effectively addresses job burnout. However, what is also expressed is that doubts exist about its ability to improve the performance of underperforming groups and/or transforming them into high-performing groups. On the one hand, universities need to provide professional psychological counseling services to academic personnel for continuous professional development and personal wellbeing. On the other hand, in order to reduce job burnout, institutions should strengthen their recruitment strategies by employing psychologists who will assess candidates' cognitive, social, and emotional intelligence and stability. This method can be more effective than relying solely on education, skills, and medical evaluation.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: further information and data set can be provided with further request. Requests to access these datasets should be directed to gs61670@student.upm.edu.my.

Ethics statement

The studies involving humans were approved by the Ethics Committee of University Putra Malaysia-UPM (JKEUPM) (REFERENCE NO: JKEUPM-2023-676). The studies were conducted in accordance with the local legislation and institutional requirements. The Yancheng Teachers University, Jiangsu, China was accountable for supervising and monitoring the research fieldwork which was conducted in China. In addition to the UPM ethical approval, the Academic Committee of Yancheng Teachers University examined the research proposal thoroughly and ensured all ethical considerations were respected. Subsequently, the Academic Committee waived the "Informed/participant Consent Statement" with a reference number YCTU20221017.

Author contributions

ML: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft. GA: Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. KB: Formal analysis, Investigation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Acknowledgments

The authors wish to thank the universities that voluntarily participated in this study.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol*. (2001) 52:397–422. doi: 10.1146/annurev.psych.52.1.397

2. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry*. (2016) 15:103–11. doi: 10.1002/wps.20311

3. Bakker AB, Demerouti E. Job demands–resources theory: taking stock and looking forward. *J Occup Health Psychol*. (2017) 22:273–85. doi: 10.1037/ocp0000056

4. Schaufeli WB, Bakker AB. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *J Organ Behav*. (2004) 25:293–315. doi: 10.1002/job.248

5. Greere A. Training for quality assurance in higher education: practical insights for effective design and successful delivery. *Qual High Educ*. (2023) 29:165–91. doi: 10.1080/13538322.2021.2020978

6. Parmar V, Channar ZA, Ahmed RR, Streimikiene D, Pahi MH, Streimikis J. Assessing the organizational commitment, subjective vitality and burnout effects on turnover intention in private universities. *Oeconomia Copernicana*. (2022) 13:251–86. doi: 10.24136/oc.2022.008

7. Amer SAAM, Elotla SF, Ameen AE, Shah J, Fouad AM. Occupational burnout and productivity loss: a cross-sectional study among academic university staff. *Front Public Health*. (2022) 10:861674. doi: 10.3389/fpubh.2022.861674

8. Watts J, Robertson N. Burnout in university teaching staff: a systematic literature review. *Educ Res*. (2011) 53:33–50. doi: 10.1080/00131881.2011.552235

9. Asfahani AM. Link between job burnout antecedents and consequences: an empirical study on higher education faculty members in the Saudi context. *J Appl Res High Educ*. (2024) 16:629–49. doi: 10.1108/JARHE-03-2023-0125

10. Lei M, Alam GM, Hassan A. Job burnout amongst university administrative staff members in China-a perspective on sustainable development goals (SDGs). *Sustain For*. (2023) 15:8873. doi: 10.3390/su15118873

11. Shahwan S, Tay EH, Shafie S, Tan YB, Gunasekaran S, Tan RHS, et al. The protective role of resilience and social support against burnout during the COVID-19 pandemic. *Front Public Health*. (2024) 12:1374484. doi: 10.3389/fpubh.2024.1374484

12. Zhang X, Zhang W, Xue L, Xu Z, Tian Z, Wei C, et al. The influence of professional identity, job satisfaction, burnout on turnover intention among village public health service providers in China in the context of COVID-19: a cross-sectional study. *Front Public Health*. (2022) 10:925882. doi: 10.3389/fpubh.2022.925882

13. Amatori S, Gobbi E, Sisti D, Pivato G, Giombini G, Rombaldoni R, et al. Physical activity, musculoskeletal disorders, burnout, and work engagement: a cross-sectional study on Italian white-collar employees. *Front Public Health*. (2024) 12:1375817. doi: 10.3389/fpubh.2024.1375817

14. Leiter MP, Maslach C. Motivation, competence, and job burnout In: AJ Elliot, CS Dweck and DS Yeager, editors. Handbook of competence and motivation: theory and application. *2nd* ed. New York: The Guilford Press (2017). 370–84.

15. Liu Y, Song Y, Jiang Y, Guo C, Zhou Y, Li T, et al. Burnout and its association with competence among dental interns in China. *Front Psychol*. (2022) 13:832606. doi: 10.3389/fpsyg.2022.832606

16. Nahas ARF, Elnaem MH, Mubarak N, Khatwa MA, Barakat M, Faller E, et al. Assessment of burnout, resilience, and thriving among academic health professionals: findings from an international study. *Front Public Health*. (2024) 12:1366612. doi: 10.3389/fpubh.2024.1366612

17. Fazey DMA, Fazey JA. The potential for autonomy in learning: perceptions of competence, motivation and locus of control in first-year undergraduate students. *Stud High Educ*. (2001) 26:345–61. doi: 10.1080/03075070120076309

18. Blaskova M, Blasko R, Figurska I, Sokol A. Motivation and development of the university teachers' motivational competence. *Procedia Soc Behav Sci*. (2015) 182:116–26. doi: 10.1016/j.sbspro.2015.04.746

19. Taris TW. Is there a relationship between burnout and objective performance? A critical review of 16 studies. *Work Stress*. (2006) 20:316–34. doi: 10.1080/02678370601065893

20. Wickham RJ. Secondary analysis research. *J Adv Pract Oncol*. (2019) 10:395–400. doi: 10.6004/jadpro.2019.10.4.7

21. UNESCO. Teachers in tertiary education programmes, both sexes (number). Washington, DC: UNESCO (2019).

22. National Bureau of Statistics of China. (2022). Available at: http://www.stats.gov.cn/sj/ndsj/2022/indexch.htm (Accessed February 14, 2024).

23. Alam GM, Giacosa E, Mazzoleni A. Does MBA's paradigm transformation follow business education's philosophy—a comparison of academic and job-performance and SES among five types of MBAian. *J Bus Res*. (2022) 139:881–92. doi: 10.1016/j.jbusres.2021.10.038

24. Paudel KP. Level of academic performance among faculty members in the context of Nepali higher educational institution. *J Comp Int High Educ*. (2021) 13:98–111. doi: 10.32674/jcihe.v13i2.2450

25. Ahmed RR, Akbar W, Aijaz M, Channar ZA, Ahmed F, Parmar V. The role of green innovation on environmental and organizational performance: moderation of human resource practices and management commitment. *Heliyon*. (2023) 9:e12679. doi: 10.1016/j.heliyon.2022.e12679

26. Musah MB, Tahir LM, Ali HM, Al-Hudawi SVH, Issah M, Farah AM, et al. Testing the validity of academic staff performance predictors and their effects on workforce performance. *Int J Eval Res Educ*. (2023) 12:941. doi: 10.11591/ijere.v12i2.24230

27. Jahangirian M, Taylor SJE, Young T, Robinson S. Key performance indicators for successful simulation projects. *J Oper Res Soc*. (2017) 68:747–65. doi: 10.1057/jors.2016.1

28. Karkoulian S, Assaker G, Hallak R. An empirical study of 360-degree feedback, organizational justice, and firm sustainability. *J Bus Res*. (2016) 69:1862–7. doi: 10.1016/j.jbusres.2015.10.070

29. Harris MM, Schaubroeck J. A meta-analysis of self-supervisor, self-peer, and peer-supervisor ratings. *Pers Psychol*. (1988) 41:43–62. doi: 10.1111/j.1744-6570.1988.tb00631.x

30. Koopmans L, Bernaards CM, Hildebrandt VH, de Vet HCW, van der Beek AJ. Construct validity of the individual work performance questionnaire. *J Occup Environ Med*. (2014) 56:331–7. doi: 10.1097/JOM.0000000000000113

31. Purohit B, Martineau T. Is the annual confidential report system effective? A study of the government appraisal system in Gujarat, India. *Hum Resour Health*. (2016) 14:33–44. doi: 10.1186/s12960-016-0133-8

32. Santalla-Banderali Z, Alvarado JM. Factorial structure of individual work performance questionnaire (version 1.0) revisited: evaluation of acquiescence bias. *PLoS One*. (2022) 17:e0271830. doi: 10.1371/journal.pone.0271830

33. Teymoori E, Zareiyan A, Babajani-Vafsi S, Laripour R. Viewpoint of operating room nurses about factors associated with the occupational burnout: a qualitative study. *Front Psychol*. (2022) 13:947189. doi: 10.3389/fpsyg.2022.947189

34. Luo A, Xu Z, Cai P, He H, Mao P, Xie W. Qualitative study on the influencing factors and countermeasures against job burnout among organ donation coordinators. *Front Public Health*. (2020) 8:571514. doi: 10.3389/fpubh.2020.571514

35. Oosterholt BG, Maes JHR, Van der Linden D, Verbraak MJPM, Kompier MAJ. Cognitive performance in both clinical and non-clinical burnout. *Stress*. (2014) 17:400–9. doi: 10.3109/10253890.2014.949668

36. Lei M, Alam GM, Bashir K, Pingping G. Whether academics' job performance makes a difference to burnout and the effect of psychological counselling—comparison of four types of performers. *PLoS One*. (2024) 19:e0305493. doi: 10.1371/journal.pone.0305493

37. Belji Kangarlou M, Fatemi F, Paknazar F, Dehdashti A. Occupational burnout symptoms and its relationship with workload and fear of the SARS-CoV-2 pandemic among hospital nurses. *Front Public Health*. (2022) 10:852629. doi: 10.3389/fpubh.2022.852629

38. WHO. Mental health at work. (2022). Available at: https://www.who.int/news-room/fact-sheets/detail/mental-health-at-work (Accessed March 3, 2024).

39. Tang L, Zhang F, Yin R, Fan Z. Effect of interventions on learning burnout: a systematic review and meta-analysis. *Front Psychol*. (2021) 12:645662. doi: 10.3389/fpsyg.2021.645662

40. Lei M, Alam GM, Bashir K, Pingping G. Does the job performance of academics' influence burnout and psychological counselling? A comparative analysis amongst high-, average-, low-, and non-performers. *BMC Public Health*. (2024) 24:1708. doi: 10.1186/s12889-024-19224-z

41. Allison PD. Fixed effects regression models. London: SAGE Publications (2009).

42. Hsiao C. Analysis of panel data. Cambridge: Cambridge University Press (2022).

43. Tsai HJ, Tsou MT. Age, sex, and profession difference among health care workers with burnout and metabolic syndrome in Taiwan tertiary hospital—a cross-section study. *Front Med*. (2022) 9:854403. doi: 10.3389/fmed.2022.854403

44. Wang L, Chen Y. Success or growth? Distinctive roles of extrinsic and intrinsic career goals in high-performance work systems, job crafting, and job performance. *J Vocat Behav*. (2022) 135:103714. doi: 10.1016/j.jvb.2022.103714

45. Ministry of Education of China. The guiding opinions on deepening the reform of the assessment and evaluation system for universities teachers. Beijing: Ministry of Education (2016).

46. Organization department of the CPC central committee. Regulations on the assessment of staff in public institutions. Beijing: Ministry of Education (2023).

47. National Health Commission. The guiding opinions on strengthening psychological health services. Beijing: Ministry of Health (2017).

48. Halbesleben JR, Demerouti E. The construct validity of an alternative measure of burnout: investigating the English translation of the Oldenburg burnout inventory. *Work Stress*. (2005) 19:208–20. doi: 10.1080/02678370500340728

49. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen burnout inventory: a new tool for the assessment of burnout. *Work Stress*. (2005) 19:192–207. doi: 10.1080/02678370500297720

50. Creswell JW. Research design in qualitative, quantitative, and mixed methods approaches. *4th* ed. Thousand Oaks, CA: Sage (2014).

51. Fourth session of the sixth national people's congress. Seventh five-year plan. Beijing: NDRC China (1986).

52. Ministry of Education of China. Several opinions on deepening the promotion of the construction of world-class universities and first-class disciplines. Beijing: Higher Education Press (2022).

53. Remenyi D, Onofrei G, English J. An introduction to statistics using Microsoft excel. Johannesburg, South Africa: University Press of University of Johannesburg (2022).

54. Yamane T. Statistics: an introductory analysis. New York: Harper and Rowe (1973).

55. Ahmed RR, Streimikiene D, Streimikis J, Siksnelyte-Butkiene I. A comparative analysis of multivariate approaches for data analysis in management sciences. *Ekono Management*. (2024) 27:192–210. doi: 10.15240/tul/001/2024-5-001

56. Ullman JB, Bentler PM. Structural equation modeling In: Handbook of psychology. 2nd ed. New York: Guilford press (2012)

57. Gordon RA. Regression analysis for the social sciences. New York: Routledge (2015).

58. Alkharusi H. Categorical variables in regression analysis: a comparison of dummy and effect coding. *Int J Educ*. (2012) 4:202–10. doi: 10.5296/ije.v4i2.1962

59. Wright TA, Cropanzano R. Emotional exhaustion as a predictor of job performance and voluntary turnover. *J Appl Psychol*. (1998) 83:486–93. doi: 10.1037/0021-9010.83.3.486

60. Muis KR, Ranellucci J, Franco GM, Crippen KJ. The interactive effects of personal achievement goals and performance feedback in an undergraduate science class. *J Exp Educ*. (2013) 81:556–78. doi: 10.1080/00220973.2012.738257

61. Wang X, Li C, Chen Y, Zheng C, Zhang F, Huang Y, et al. Relationships between job satisfaction, organizational commitment, burnout and job performance of healthcare professionals in a district-level health care system of Shenzhen, China. *Front Psychol*. (2022) 13:992258. doi: 10.3389/fpsyg.2022.992258

62. Jia H, Shang P, Gao S, Cao P, Yu J, Yu X. Work stress, health status and presenteeism in relation to task performance among Chinese medical staff during COVID-19 pandemic. *Front Public Health*. (2022) 10:836113. doi: 10.3389/fpubh.2022.836113

63. Žydžiūnaitė V, Arce A. Being an innovative and creative teacher: passion-driven professional duty. *Creat Stud*. (2021) 14:125–44. doi: 10.3846/cs.2021.14087

64. Kennedy F. Beyond "prevention is better than cure": understanding prevention and early intervention as an approach to public policy. *Policy Des Pract*. (2020) 3:351–69. doi: 10.1080/25741292.2020.1736766

65. Anwar N, Nik Mahmood NH, Yusliza MY, Ramayah T, Noor Faezah J, Khalid W. Green human resource management for organisational citizenship behaviour towards the environment and environmental performance on a university campus. *J Clean Prod*. (2020) 256:120401. doi: 10.1016/j.jclepro.2020.120401

66. Van Ruysseveldt J, Verboon P, Smulders P. Job resources and emotional exhaustion: the mediating role of learning opportunities. *Work Stress*. (2011) 25:205–23. doi: 10.1080/02678373.2011.613223

frontiers | Frontiers in Public Health

TYPE Original Research
PUBLISHED 17 January 2025
DOI 10.3389/fpubh.2025.1424399

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Devashish Konar,
Mental Health Care Centre, India
Oshin Miranda,
Brown University, United States

*CORRESPONDENCE
Haohao Zhu
✉ zhuhh@jiangnan.edu.cn
Qitao Yin
✉ yqt1209@163.com

†These authors have contributed equally to this work

RECEIVED 28 April 2024
ACCEPTED 02 January 2025
PUBLISHED 17 January 2025

CITATION
Li S, Ji Y, Yang Q, Jiang Y, Yin Q and Zhu H (2025) Influencing factors of the participation of patients with severe mental disorders in community health service management. *Front. Public Health* 13:1424399. doi: 10.3389/fpubh.2025.1424399

Influencing factors of the participation of patients with severe mental disorders in community health service management

Shiming Li†, Yingying Ji†, Queping Yang, Ying Jiang, Qitao Yin* and Haohao Zhu*

Affiliated Mental Health Center of Jiangnan University, Wuxi Central Rehabilitation Hospital, Wuxi, Jiangsu, China

Objective: This study aimed to explore the participation of patients with severe mental disorders in community health service management and its influencing factors in Wuxi.

Methods: The data of patients with severe mental disorders were extracted from the Jiangsu Provincial Management System between 2019 and 2021. The participation of patients in community health service management was analyzed. A univariate stratified analysis will be used to assess the impact of various factors on inclusion in community management. Logistic regression modeling will be employed to identify influencing factors. Ultimately, negative factors affecting participation in community health management will be identified, followed by targeted qualitative analysis through interviews.

Results: A total of 27,977 individuals were included in the analysis, with 25,744 participants enrolled in community health service management, resulting in a management rate of 92.02%. Multivariate logistic regression analysis revealed the following negative factors influencing participation in community health service management: Age group 31–40 years (OR = 0.532, 95% CI: 0.434–0.653), Age group 41–50 years (OR = 0.557, 95% CI: 0.468–0.663), Age group 51–60 years (OR = 0.746, 95% CI: 0.635–0.877), Age group >60 years (OR = 0.840, 95% CI: 0.719–0.969), Duration of illness 6–10 years (OR = 0.376, 95% CI: 0.307–0.461), Duration of illness 11–15 years (OR = 0.312, 95% CI: 0.249–0.390), Duration of illness 16–20 years (OR = 0.702, 95% CI: 0.529–0.932), Duration of illness >20 years (OR = 0.701, 95% CI: 0.514–0.957), Education level of college or above (OR = 0.719, 95% CI: 0.560–0.923), Current student status (OR = 0.565, 95% CI: 0.419–0.760), Absence of social welfare benefits (OR = 0.643, 95% CI: 0.572–0.723), History of violent or harmful behavior (OR = 0.553, 95% CI: 0.442–0.692), Non-participation in community rehabilitation activities (OR = 0.170, 95% CI: 0.101–0.284). Conversely, the following factors were identified as positive influences on participation: Being a farmer (OR = 1.423, 95% CI: 1.215–1.665), Widowhood (OR = 2.355, 95% CI: 1.583–3.503), Divorce (OR = 2.992, 95% CI: 2.093–4.278). Qualitative analysis indicated that stigma associated with the illness, concerns over information disclosure, lack of social support, impacts on family members (e.g., children's education or marriage prospects), perceived ineffectiveness of community services, lack of awareness about available community health services, and the belief that services were unnecessary contributed to non-participation in community health service management.

Conclusion: The participation rate of patients with severe mental disorders in health service management is relatively low in the Wuxi. Special attention should be given to patients with severe mental disorders who exhibit negative factors, such as being middle-aged or young, having a long duration of illness, a history of violent or harmful behavior, higher education levels (college and above), student status, or lack of social welfare benefits. Efforts should focus on providing social support activities, reducing stigma associated with the illness, and further improving the management rate.

KEYWORDS

severe mental disorders, community health service management, influencing factors, Wuxi, China

1 Introduction

Mental health is a major public health issue in China that has been gaining increasing attention as society develops. In July 2009, the Ministry of Health, Ministry of Finance, and other departments jointly issued the "Opinions on Promoting the Gradual Equalization of Basic Public Health Services," which included the service management of patients with severe mental disorders as one of the public health service projects in China. According to the requirements of the "Management and Treatment Guidelines for Severe Mental Disorders (2018 edition)" (1) and the "National Basic Public Health Service Specifications (Third Edition)" (2) community primary healthcare institutions are required to provide basic public health services to all severe mental disorder patients who meet the six diagnostic categories (schizophrenia, intellectual disability with comorbid mental disorders, bipolar affective disorder, schizoaffective disorder, paranoid schizophrenia, and mental disorders caused by epilepsy) and give informed consent. The specific services include patient follow-up management, risk assessment, medication guidance, rehabilitation treatment, and nursing health education.

Patients with severe mental disorders often have a high risk of relapse and disability. Therefore, effective monitoring of patients is essential to prevent disease relapse, accidents, and situations where the lack of family and community healthcare institution management can result in harm to oneself or others. Disease relapse not only affects the recovery of patients but also increases the burden on patients and society. In some cases, it can seriously disrupt public order and social stability. Therefore, it is crucial to provide effective health service management for patients with severe mental disorders in the community, including disease assessment, health education, and other basic public health services. This not only helps prevent and control disease relapse but also enables targeted interventions for specific situations (3).

The prevention and control of community mental health in China began in 1958 (4, 5). Although the development of community mental health prevention and control work was slow in the 19th century, it is widely regarded as the best approach to providing mental health treatment and care (6). Since 2004, due to the growing importance of mental health, China implemented a mental health program known as the "686 Program" (7), establishing a community mental health service system. This program promoted community mental health work in China and became a significant part of the subsequent development of community mental health services.

The community mental health service system primarily involves general practitioners and rural doctors in the early detection, treatment, and relapse prevention of patients with severe mental disorders, as well as patient information management and follow-up visits conducted at least four times a year for stabilized patients. In cases of emergencies or severe medication side effects, free crisis management services are also provided. Nurses are rarely involved in community mental health work. They assist in recording patient follow-up information and help doctors with health education for patients, such as medication guidance and management. By the end of 2020, there were 6.43 million registered patients receiving community mental health services, with a reported prevalence rate of 0.46%; 6.11 million of these patients were under management, resulting in a management rate of 95.12% (8). However, due to various reasons such as stigma, limited accessibility, and the perceived benefits of community services, the utilization rate of community mental health services in China remains low.

In terms of community mental health prevention strategies, apart from providing routine mental health promotion activities for community residents, the main prevention strategy lies in promptly identifying patients with severe mental disorders through community health services and guiding them to specialized mental health institutions for diagnosis and treatment. For registered patients with severe mental disorders in the community, community doctors are required to conduct regular follow-ups to assess their mental state and living conditions, detect signs of relapse or new mental health issues in a timely manner, and provide appropriate interventions. They also offer psychological support to patients and their families, improving their understanding of mental illness. Rehabilitation institutions or services are established in some communities to provide rehabilitation training for mental health patients, enhancing their sense of social belonging and promoting social integration. Although the quality and utilization rate of community mental health services in China remain relatively low, they still serve as the main prevention and control system for community mental health, playing a critical role.

Regarding the cost-benefit analysis of community mental health prevention and control, although certain human, material, and financial resources are required during implementation, the benefits of reducing the prevalence of mental illness, improving patients' health, reducing relapse rates, facilitating patients' reintegration into the community, and promoting social harmony outweigh the costs. These efforts not only alleviate the economic and psychological burden on patients and their families but also save substantial medical and social costs for society (9), contributing to sustainable social development. At the same time, it should be noted that mental health resources are still insufficient to meet the needs of all mental illness patients in current public health planning and resource allocation. Greater attention should be paid to and efforts made to strengthen community mental health prevention and control work, continuously optimizing prevention and control models and resource utilization efficiency to achieve greater cost-effectiveness.

2 Materials and methods

2.1 Data source

The data were obtained from the Jiangsu Provincial Management System for Severe Mental Disorders, covering the period from 2019 to 2021, and specifically focusing on registered patients with severe mental disorders in Wuxi city. Severe mental disorder patients were diagnosed according to the ICD-10 criteria and classified into six categories, including schizophrenia, intellectual disability with comorbid mental disorders, bipolar affective disorder, schizoaffective disorder, paranoid schizophrenia, and mental disorders caused by epilepsy. A total of 27,977 cases were included as study subjects, and their personal basic information and follow-up records were collected. Inclusion criteria for the study subjects were: (1) age $\geq$ 14 years; (2) clear diagnosis and reporting unit; (3) informed consent was obtained from guardians. Cases with a significant amount of missing basic information and those who had been transferred out of the follow-up management system were excluded. This study was approved by the ethics committee of our institution.

2.2 Survey content and definitions

A cross-sectional study design was used to collect and summarize the basic information and treatment details of registered patients. This included gender, age, education level, occupation, marital status, social welfare status, medical insurance, diagnostic classification, disease duration, duration of medication, and other medical information. Additional information collected included past symptoms of the patients, participation in basic public health projects for community management, community rehabilitation services, and occurrence of harmful incidents (or risk assessment level 3 or above). The determination of harmful incidents was cross-checked and confirmed with the local public security bureau. Social welfare refers to the minimum livelihood guarantee system, which provides subsidies to families with severe disabilities or loss of labor capacity due to illness. Harmful incidents are defined as violations of the Public Security Administration Punishment Law of the People's Republic of China that do not constitute a criminal offense, while harmful events are criminal behaviors that violate relevant articles of the Criminal Law of China (7). The risk assessment is divided into levels 0–5: Level 0: No behavior matching any of the criteria for levels 1–5. Level 1: Verbal threats or shouting, but no destructive behavior. Level 2: Destructive behavior confined to the home, targeting property, and can be stopped through persuasion. Level 3: Significant destructive behavior, indiscriminate of location, targeting property, and cannot be stopped through persuasion. Level 4: Persistent destructive behavior, indiscriminate of location, targeting property or people, and cannot be stopped through persuasion. Level 5: Violent behavior targeting individuals with controlled dangerous weapons, or actions such as arson or explosions. We reviewed the risk assessment levels (0–5) of patients in the archival system and defined levels 3 and above as "violent or harmful behavior."

2.3 Statistical analysis

Data analysis was conducted using SPSS 19.0 statistical software. Continuous data were presented as X $\pm$ s, while categorical data were tested using the chi-square test. Group comparisons were performed using the chi-square test. Variables with statistically significant differences were included in the multivariable logistic regression analysis. The factors influencing the participation of patients in community health service management were analyzed through regression analysis, with the assignment of independent variables as shown in Table 1. A significance level of $P < 0.05$ was considered statistically significant. In the qualitative study, we used a convenience sampling method to randomly select some patients who declined community management for interviews. The interviews were conducted with open-ended questions, such as "Why are you unwilling to participate in community management?" to understand the true thoughts and reasons behind patients' refusal to participate in community management.

3 Results

3.1 Demographic characteristics

A total of 27,977 patients were included in the study, among which 25,744 patients agreed to participate in community management. Of the patients who agreed to participate, 12,159 were male and 13,585 were female, with an average age of 48.57 $\pm$ 12.35 years. The majority had an education level of elementary school or below (11,543 patients). The most common occupation was unemployed or laid-off workers (8,308 patients). Regarding marital status, the highest proportion were married (14,200 patients), and the majority were economically non-poor (19,463 patients). The average duration of illness was 15.02 $\pm$ 5.24 years, and the average duration of medication use was 16.01 $\pm$ 3.99 years.

A total of 2,233 patients declined to participate in community management. Among them, 1,043 were male and 1,190 were female, with an average age of 44.77 $\pm$ 13.64 years. The majority

10.3389/fpubh.2025.1424399

TABLE 1 Assignment of variables for logistic regression.

Variable	Assignment
Participation in community health service management	0 = No, 1 = Yes
Age (years)	0 = ≤18, 1 = 19–30, 2 = 31–40, 3 = 41–50, 4 = 51–60, 5 = >60
Education level	0 = Primary school and below, 1 = Junior high school, 2 = High school/vocational school, 3 = College and above
Occupation	0 = Unemployed or jobless, 1 = Employed, 2 = Farmer, 3 = Student, 4 = Retired, 5 = Professional/technical personnel
Registered residence	0 = Local, 1 = Non-local
Marital status	0 = Unmarried, 1 = Married, 2 = Widowed, 3 = Divorced
Violent or harmful behavior	0 = No, 1 = Yes
Social welfare status	0 = No, 1 = Yes
Disease duration (years)	0 = 0–5, 1 = 6–10, 2 = 11–15, 3 = 16–20, 4 = >20
Duration of medication (years)	0 = 0–5, 1 = 6–10, 2 = 11–15, 3 = 16–20, 4 = >20
Disability certificate status	0 = None, 1 = Mental disability certificate, 2 = Physical disability certificate
Participation in community rehabilitation activities	0 = Yes, 1 = No

had an education level of elementary school or below (789 patients). The most common occupation was unemployed or laid-off workers (712 patients). Regarding marital status, the highest proportion were married (1,223 patients), and the majority were economically non-poor (1,726 patients). The average duration of illness was 14.23 ± 3.81 years, and the average duration of medication use was 15.10 ± 4.20 years. As shown in Table 2.

3.2 Community health service management participation among patients with severe mental disorders of different characteristics

The participation rate of severe mental disorder patients in community health service management was 92.02%. There were significant differences in the participation rate among different age groups, education levels, occupations, marital statuses, disease durations, and durations of medication ($P < 0.05$). Patients with local registered residence had a higher participation rate compared to non-local patients. Patients with violent or harmful behavior had a higher participation rate compared to those without a history. Patients receiving social welfare benefits had a higher participation rate compared to those without benefits. Patients with a disability certificate had a higher participation rate compared to those without a certificate. Patients who did not participate in community rehabilitation activities had a higher participation rate compared to non-participants. These differences were statistically significant ($P < 0.05$). Refer to Table 3 for details.

TABLE 2 General information of included patients.

Factors	Total number	Agreed to participate ($n = 25,744$)	Declined to participate ($n = 2,233$)
Gender			
Male	13,202	12,159 (92.10%)	1,043 (7.90%)
Female	14,775	13,585 (91.95%)	1,190 (8.05%)
Age	27,969	48.57 ± 12.35	49.77 ± 13.64
Education level			
Primary school and below	12,332	11,543 (93.60%)	789 (6.40%)
Junior school	9,597	8,894 (92.67%)	703 (7.33%)
High/vocational school	3,825	3,437 (89.86%)	388 (10.14%)
College and above	2,016	1,682 (83.43%)	334 (16.57%)
Occupation			
Unemployed or jobless	9,020	8,308 (92.11%)	712 (7.89%)
Employed	3,560	3,194 (89.72)	366 (10.28%)
Farmer	7,319	6,887 (94.10)	432 (5.90%)
Student	459	366 (79.74%)	93 (20.26%)
Retired	3,153	2,965 (94.04%)	188 (5.96%)
Professional/technical personnel	328	271 (82.62%)	57 (17.38%)
Registered residence			
Local	27,808	25,606 (92.08%)	2,202 (7.92%)
Non-local	169	138 (81.66%)	31 (18.34%)
Marital status			
Unmarried	9,234	8,485 (91.89%)	749 (8.11%)
Married	15,423	14,200 (92.07%)	1,223 (7.93%)
Widowed	1,055	984 (93.27%)	71 (6.73%)
Divorced	1,919	1,796 (93.59%)	123 (6.41%)
Violent or harmful behavior			
Yes	2,008	1,916 (95.42%)	92 (4.58%)
No	25,969	23,828 (91.76%)	2,141 (8.24%)
Economic status			
Impoverished	6,788	6,281 (92.53%)	507 (7.47%)
Non-impoverished	21,189	19,463 (91.85%)	1,726 (8.15%)
Social welfare status			
Yes	4,858	4,556 (93.78%)	302 (6.22%)
No	23,119	21,188 (91.65%)	1,931 (8.35%)
Disability certificate status			
Yes	15,368	13,631 (88.70%)	1,737 (11.30)
Mental disability certificate	8,266	7,881 (95.34%)	385 (4.66%)
Physical disability certificate	4,251	4,141 (97.41%)	110 (2.59%)

(Continued)

10.3389/fpubh.2025.1424399

TABLE 2 (Continued)

Factors	Total number	Agreed to participate ($n = 25,744$)	Declined to participate ($n = 2,233$)
Participation in community rehabilitation activities			
No	1,240	1,225 (98.79%)	15 (1.21%)
Yes	26,737	24,519 (91.70%)	2,218 (8.30%)
Disease duration (years)	27,977	15.02 ± 5.24	16.01 ± 3.99
Medication duration (years)	27,973	14.23 ± 3.81	15.10 ± 4.20

3.3 Influencing factors of the participation of patients with severe mental disorders in community health service management

The variables with statistical significance in the stratified analysis were included in a multivariate logistic regression model. The results indicated that the main factors influencing participation in community health service management among patients with severe mental disorders include age, duration of illness, marital status, education level, presence of social welfare benefits, occupation, history of violent or harmful behavior, and participation in community rehabilitation activities. Compared with the <18-year-old group, patients in the 31–40, 41–50, 51–60, and >60 age groups were more likely to refuse participation in community health service management. Compared with the group with a duration of illness of 0–5 years, patients with a duration of 6–10 years, 11–15 years, 16–20 years, and >20 years were more likely to refuse participation. Patients with a college education or above, students, those without social welfare benefits, those with a history of violent or harmful behavior, and those who do not participate in community rehabilitation activities were negative factors for participation in community health service management. On the other hand, being a farmer, widowed, or divorced were positive factors for participation (see Table 4).

3.4 Qualitative study on patients who declined community management

Based on preliminary telephone and in-home interviews conducted for this study, we investigated 286 patients who declined community management. Among them, 102 patients were interviewed in person during home visits, and 184 patients were surveyed via telephone. The primary characteristics of these patients included high educational attainment and being part of a mobile population. The reasons for refusing community management were mainly composed of stigma associated with the illness, concerns about information disclosure, lack of social support, impacts on family harmony, hindrances to young people's education and marriage, dissatisfaction with the perceived outcomes of community services, lack of understanding about

TABLE 3 Stratified analysis of factors affecting community management participation.

Factors	Total number	Participants	Rate (%)	χ^2	P
Gender					
Male	13,202	12,159	92.10	0.23	0.64
Female	14,775	13,585	91.95		
Age					
≤18	368	344	93.48	260.74	<0.05
19 30	2,780	2,392	86.04		
31 40	4,352	3,873	88.99		
41 50	5,820	5,386	92.54		
51 60	6,494	6,068	93.44		
>60	8,155	7,677	94.14		
Education level					
Primary school and below	12,332	11,543	93.60	287.67	<0.05
Junior school	9,597	8,894	92.67		
High/vocational school	3,825	3,437	89.86		
College and above	2,016	1,682	83.43		
Occupation					
Unemployed or jobless	9,020	8,308	92.11	229.82	<0.05
Employed	3,560	3,194	89.72		
Farmer	7,319	6,887	94.10		
Student	459	366	79.74		
Retired	3,153	2,965	94.04		
Professional/technical personnel	328	271	82.62		
Registered residence					
Local	27,808	25,606	92.08	24.86	<0.05
Non-local	169	138	81.66		
Marital status					
Unmarried	9,234	8,485	91.89	70.01	<0.05
Married	15,423	14,200	92.07		
Widowed	1,055	984	93.27		
Divorced	1,919	1,796	93.59		
Violent or harmful behavior					
Yes	2,008	1,916	95.42	34.05	<0.05
No	25,969	23,828	91.76		
Economic status					
Impoverished	6,788	6,281	92.53	3.21	0.07
Non-impoverished	21,189	19,463	91.85		

(Continued)

TABLE 3 (Continued)

Factors	Total number	Participants	Rate (%)	χ^2	*P*
Social welfare status					
Yes	4,858	4,556	93.78	24.94	<0.05
No	23,119	21,188	91.65		
Disease duration (years)					
0 5	2,730	2,322	85.05	435.88	<0.05
6 10	4,184	3,666	87.62		
11 15	3,922	3,574	91.13		
16 20	3,570	3,329	93.25		
>20	13,571	12,853	94.71		
Medication duration (years)					
0 5	9,136	8,230	90.08	249.09	<0.05
6 10	4,373	3,875	88.61		
11 15	3,449	3,177	92.11		
16 20	2,976	2,797	93.99		
>20	8,039	7,661	95.30		
Disability certificate status					
Yes	15,368	13,631	88.70	529.50	<0.05
Mental disability certificate	8,266	7,881	95.34		
Physical disability certificate	4,251	4,141	97.41		
Participation in community rehabilitation activities					
No	1,240	1,225	98.79	81.02	<0.05
Yes	26,737	24,519	91.70		

community health services, and the belief that services or medication were unnecessary. See Table 5 for details.

4 Discussion

Patients with severe mental disorders often experience relapses and have long-term illness durations. The majority of their recovery time is spent in the community, making community health service management particularly important for these patients. It plays a crucial role in promoting the long-term stability of patients with severe mental disorders. In China, the government has included the management and treatment of severe mental disorders in the national basic public health service program (1).

This study found that the rate of community health service management among patients with severe mental disorders in Wuxi was 92.02%, which is lower than the national rate of 95.12% (8). The level of economic development, cultural background, and assistance policies in different regions influence the community health service management of patients with severe mental disorders. There are often regional disparities in development and significant differences in the utilization of public health services (10, 11). This study provides scientific evidence to improve the management rate in the local area by analyzing the participation of patients with severe mental disorders in community health service management and its influencing factors.

Effective management of patients with severe mental disorders not only helps alleviate the economic and family burden for patients and their families but also reduces the social burden through increased social support and basic public health services (12). This study found that older patients are less willing to participate in community health service management compared to younger patients. This may be due to older patients being less aware of community health service management policies and having difficulty understanding the meaning of basic public health services, making it more challenging for them to accept such services. We also found that longer duration of illness is a negative factor for participating in community health service management. This may be because patients with longer illness durations experience repeated episodes, long-term medication, and lose hope in the treatment of their illness, leading to a negative attitude toward the disease and a lack of confidence in primary community health services (13). Patients with higher education levels, particularly those with college and above education, are also less likely to accept community health service management. This could be attributed to increased awareness and understanding of mental illnesses with higher levels of education, as well as concerns about privacy, making it more challenging for them to participate in community health service management (14). Compared to unemployed individuals, students show a negative association with participating in community health service management. This could be because students may feel protected in their school environment and may be reluctant to disclose their mental illnesses, experiencing stigma and avoiding community health service management (15). Patients who do not receive social welfare support also show a negative association with participating in community health service management. Patients who do not qualify for social welfare support often have better financial conditions and more ability and experience in taking care of themselves, making them less inclined to participate in free community health service management programs. Patients who do not participate in community rehabilitation activities also show a negative association with participating in community health service management. Compared to patients who participate in community rehabilitation activities, those who do not receive the same level of social support, including care from the neighborhood or community, and planned rehabilitation activities from mental health professionals. These factors can promote patient recovery, improve their community functioning, reduce self-stigma, alleviate the burden on families, and facilitate the acceptance of basic public health services (16, 17).

Furthermore, this study found that patients with occupations as farmers are more likely to participate in community-based health service management. This could be attributed to their limited knowledge of mental health and reliance on primary community health services, leading to better compliance with

10.3389/fpubh.2025.1424399

TABLE 4 Multivariate logistic regression analysis of factors influencing the participation of patients with severe mental disorders in community health service management.

Factors	β	Wald χ^2	P	OR	95% CI	
					Lower	Upper
Age						
≤18				1.000		
19 30	0.364	2.119	0.145	1.439	0.881	2.350
31 40	−0.631	36.687	<0.05	0.532	0.434	0.653
41 50	−0.585	43.011	<0.05	0.557	0.468	0.663
51 60	−0.293	12.547	<0.05	0.746	0.635	0.877
>60	−0.180	5.640	0.018	0.835	0.719	0.969
Disease duration (years)						
0 5				1.000		
6 10	−0.978	88.491	<0.05	0.376	0.307	0.461
11 15	−1.166	102.53	<0.05	0.312	0.249	0.390
16 20	−0.354	6.000	0.014	0.702	0.529	0.932
>20	−0.355	4.994	0.025	0.701	0.514	0.957
Education level						
Primary school and below				1.000		
Junior school	0.088	1.854	0.173	1.092	0.962	1.240
High/vocational school	0.020	0.051	0.821	1.020	0.860	1.209
College and above	−0.330	6.691	0.010	0.719	0.560	0.923
Occupation						
Unemployed or jobless				1.000		
Employed	0.048	0.335	0.563	1.049	0.892	1.233
Farmer	0.352	19.260	<0.05	1.423	1.215	1.665
Student	−0.572	14.187	<0.05	0.565	0.419	0.760
Retired	0.415	1.506	0.264	1.515	1.232	1.862
Professional/technical personnel	−0.069	0.167	0.683	0.933	0.671	1.299
Marital status						
Unmarried				1.000		
Married	0.884	2.537	0.846	2.420	1.778	3.294
Widowed	0.857	17.888	<0.05	2.355	1.583	3.503
Divorced	1.096	36.098	<0.05	2.992	2.093	4.278
Social welfare status						
Yes				1.000		
No	−0.441	54.660	<0.05	0.643	0.572	0.723
Violent or harmful behavior						
No				1.000		
Yes	−0.592	27.022	<0.05	0.553	0.442	0.692
Participation in community rehabilitation activities						
Yes				1.000		
No	−1.775	45.645	<0.05	0.170	0.101	0.284

TABLE 5 Analysis of reasons for not participating in community management.

Factors	Number of patients	Proportion (%)
Stigma associated with the illness	215	75.26%
Concerns about information disclosure, impact on family harmony, and lack of social support	203	71.15%
Dissatisfaction with expected outcomes	178	62.11%
Hindrances to young people's education and marriage	165	57.85%
Guardians' lack of understanding about community service management	158	55.24%
Belief that medication or visits are unnecessary	147	51.48%

community health service management. In contrast, compared to unmarried patients, those who are widowed or divorced are more likely to participate in community health service management. This may be because patients rely more on social support after marital failure and tend to have greater trust in community health workers (18). This can help them effectively manage their mental illness, prevent relapses, and reduce the occurrence of harmful behaviors. Several studies have shown that comprehensive community management interventions for patients with severe mental disorders have positive effects, reducing relapses and harmful behaviors, and alleviating the burden on both society and patients (19, 20). Therefore, it is essential to encourage the participation of patients with severe mental disorders in basic public health service programs, promote their social functioning, and integrate them into society.

In the qualitative interviews targeting patients less likely to participate in community management, we found that 50% of individuals cited stigma, concerns about information disclosure, worries about the impact of their illness on family finances, education, and social interactions, as well as insufficient awareness of community health services, as the main reasons for not participating. It is not difficult to imagine that discrimination against mental illness is still prevalent in society. Many parents teach their children to avoid mental illness patients, highlighting the challenges of integrating patients with mental disorders into society. Furthermore, the confidentiality concerns raised by some patients and families stem from community staff collecting patient information and conducting home visits or telephone follow-ups according to guidelines, which can cause distress. Some patients also reported that receiving community health services did not improve their condition, leading to a gradual loss of interest in these services and their refusal to participate in follow-up management. Additionally, there are patients who believe their condition is stable and that reducing or discontinuing medication has no impact on their health, making them less reliant on community management.

The strengths of this study lie in its large sample size, which investigated whether patients with severe mental disorders participate in community health service management and explored the influencing factors. Additionally, qualitative interviews with patients who declined community management were conducted to understand their subjective perceptions, providing valuable insights for future mental health work. However, this study has certain limitations. First, the data were sourced from Wuxi City, making the data source singular. The exclusion of patients with incomplete information and those without a confirmed diagnosis also impacts the results, limiting the generalizability of the findings across other regions in China. Furthermore, the lack of information about patient caregivers, as well as details regarding patient satisfaction, relapse rates, and the efficiency of basic public health services after participating in community health service management, requires further exploration. Future research will adopt longitudinal designs, more detailed variable definitions, advanced statistical analyses, and additional data sources to further investigate related topics.

In conclusion, patients with severe mental disorders should be encouraged to participate in basic public health service programs to promote their recovery of social functioning and reintegration into society, while providing adequate social support. Policies supporting free medication for impoverished patients, increasing the frequency and amount of medical assistance (21), and reducing societal discrimination against patients and their families should be implemented. For patients who decline participation in community health service management, targeted health education and policy promotion should be conducted to improve the management rate of community health services for patients with severe mental disorders.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Ethics statement

The studies involving humans were approved by Ethics Committee of Wuxi Mental Health Centre. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SL: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. YJ: Data curation, Formal analysis, Investigation, Methodology, Writing – original draft. QY: Data curation, Investigation, Methodology, Writing – original draft. JY: Data curation, Investigation, Methodology, Project administration, Validation, Writing – original draft. QY: Data curation, Formal analysis, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. ZH: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project

administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. The work was supported by the National Natural Science Foundation of China (82104244), Wuxi Municipal Science and Technology Bureau (K20231039 and K20231049), Top Talent Support Program for young and middle-aged people of Wuxi Health Committee (HB2023088), Scientific Research Program of Wuxi Health Commission (M202211, Q202457), Wuxi Taihu Talent Project (WXTTP2021), and Wuxi Medical Development Discipline Project (FZXK2021012).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

1. Notice of the National Health Commission on the issuance of the "Management and Treatment Work Specification for Severe Mental Disorders (2018 Edition)." *Gazette of the State Council of the People's Republic of China*. China Government Net (2018).

2. Notice of the National Health and Family Planning Commission on the issuance of the "National Basic Public Health Service Specification (Third Edition)." *Bulletin of the National Health and Family Planning Commission of the People's Republic of China*. National Health and Family Planning Commission (2017).

3. Xu F, He H, Pan W, Xue L, Li K. Analysis of the management status of patients with severe mental disorders in Gansu Province from 2019 to 2020. *Chin J Public Health Manage*. (2022) 38:633–5+639.

4. Liu J, Ma H, He YL, Xie B, Xu YF, Tang HY, et al. Mental health system in China: history, recent service reform and future challenges. *World Psychiatry*. (2011) 10:210–6. doi: 10.1002/j.2051-5545.2011.tb00059.x

5. Ma Z, Huang H, Chen Q, Chen F, Abdullah AS, Nie G, et al. Mental health services in rural China: a qualitative study of primary health care providers. *Biomed Res Int*. (2015) 2015:151053. doi: 10.1155/2015/151053

6. Ma H, Liu J, He YL, Xie B, Xu Y, Hao W, et al. An important direction for reforming China's mental health service model: the 686 program. Chinese Mental Health Journal. (2011) 25:725–8.

7. Zhang WF, Ma N, Wang X, Wu X, Zhao M, Chen R, et al. Analysis of the current situation of management and treatment of patients with severe mental disorders in China in 2020. *Chin J Psychiatry*. (2022) 55:122–8.

8. Pennington M, McCrone P. The cost of relapse in schizophrenia. *Pharmacoeconomics*. (2017) 35:921–36. doi: 10.1007/s40273-017-0515-3

9. Jiang F, Yan G. Analysis of factors influencing the occurrence of harmful behaviors in severely mentally ill patients managed in the community in Chengdu. *Modern Prevent Med*. (2019) 14:2584–7.

10. Zhang W, Hou H, Li X, Ma Q, Zhang Q, Ren Q. Analysis of the utilization of public health services and influencing factors among severely mentally ill patients in rural areas of Wenchang Lake District. *J Chron Dis*. (2022) 23:1281–5+1289. doi: 10.16440/J.CNKI.1674-8166.2022.09.01

11. Sun S, Bai J, Yun Q, Li Y, Chang C. Analysis of the management and treatment services for severe mental disorders in China from 2014 to 2017 and its equity. *Chin J Mental Health*. (2022) 36:185–90.

12. Lu C, Cheng J, Qing L, Liu C, Su H, Lin W. Characteristics and community management status of severe mental disorder patients in Bao'an District, Shenzhen. *Chin J General Pract*. (2022) 20:1901–4. doi: 10.16766/j.cnki.issn.1674-4152.002731

13. Guo Z, Wang Y, Wang C, Wang H, Zhang R, Yao F. Medication compliance and its influencing factors in patients with severe mental disorders in Henan Province. *Chin J Psychiatry*. (2020) 53:321–7. doi: 10.3760/cma.j.cn113661-20190731-00254

14. Xie F, Li H, Cao N. Investigation of the knowledge and attitudes toward mental health among family members of patients with severe mental disorders. *South China J Prevent Med*. (2022) 48:1029–32.

15. Zhang Q, Tao H, Ju K. Analysis of the current situation of illness stigma among patients with mental disorders in a certain district of Shanghai. *Shanghai J Prevent Med*. (2022) 34:168–72. doi: 10.19428/j.cnki.sjpm.2022.21439

16. Zhao W, Zhu Y, Luo X, Liu S, Ma X, Wang X. Proactive community treatment models for the management and treatment of severe mental disorders (review). *Chin J Mental Health*. (2014) 28: 89–96.

17. Lin H, Liang Z, Liang P, Liu C, Li Q, Liu Z, et al. Investigation and intervention of illness stigma among patients with severe mental disorders and their family members. *Chin J General Pract*. (2014) 2014:1551–3.

18. Wang R, Song S, Zhou Y, Liu Y. Analysis of the current status of social support and its influencing factors among family caregivers of severe mental disorder patients. *Chin J General Pract*. (2022) 25:480–8.

19. Xu Y, Li Y, Jiang B. Meta-analysis of the effect of comprehensive management interventions on harmful behaviors of severe mental illness patients in the community. *Chin J Public Health*. (2015) 31:1091–4.

20. Zhang P, Zhang B. Evaluation of the effect of continuous "specialized and comprehensive" management model for severe mental disorder patients. *Chin J Neurol Psychiatry*. (2022) 48:360–4.

21. Gao Y, Wang H, Zhai Z, Lu W, Tian Z, Sha J, et al. Research on rescue and assistance strategies for severe mental disorder patients in China. *Health Soft Sci*. (2022) 36:16–21.

frontiers | Frontiers in Psychiatry

TYPE Original Research
PUBLISHED 29 January 2025
DOI 10.3389/fpsyt.2024.1448487

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Isain Zapata,
Rocky Vista University, United States
Marie Von Lilienfeld-Toal,
Ruhr University Bochum, Germany

*CORRESPONDENCE
Nora M. Laskowski
nora.laskowski@rub.de

RECEIVED 13 June 2024
ACCEPTED 25 November 2024
PUBLISHED 29 January 2025

CITATION
Hambruch HR, Laskowski NM, Juster R-P, Halbeisen G and Paslakis G (2025) An expert perspective on diversity-oriented standards for assessing sex and gender in clinical research.
Front. Psychiatry 15:1448487.
doi: 10.3389/fpsyt.2024.1448487

An expert perspective on diversity-oriented standards for assessing sex and gender in clinical research

Hannah R. Hambruch[1], Nora M. Laskowski[1]*, Robert-Paul Juster[2], Georg Halbeisen[1] and Georgios Paslakis[1]

[1]University Clinic for Psychosomatic Medicine and Psychotherapy, Medical Faculty, Ruhr-University Bochum, Luebbecke, Germany, [2]Research Center of the Institut Universitaire en Santé Mentale de Montréal, Department of Psychiatry and Addiction, Université de Montréal, Montréal, QC, Canada

Introduction: Randomized controlled trials require diverse patient groups to ensure broad applicability of results. However, gender minorities are often not included, which affects the generalizability and equity of healthcare outcomes. Inclusive research must consider the diversity of sex and gender to eliminate inequalities and improve health outcomes.

Methods: A two-stage expert survey was conducted using a self-developed questionnaire in which the constructs of sex, gender, and gender expression were considered. Experts rated the importance and practicality of assessing these concepts in clinical trials and evaluated terms for suitability and comprehension. In addition, existing definitions were refined. Consensus was defined as 70% agreement or disagreement.

Results: 14 out of 17 participating experts agreed on the importance to independently assess sex assigned at birth, and 9 out of 16 emphasized this for gender identity in clinical trials. Sex should be assessed with "Please specify your sex assigned at birth" and the answer categories "female", "male", "intersex". Gender identity should be assessed with "I identify as..." and the answer categories "woman", "man", "nonbinary", "trans woman", "trans man", "genderqueer", "genderfluid", "agender", "two spirit". Assessment of gender expression depends on the research question and may not be relevant for every study.

Discussion: Our findings emphasize inclusivity by providing multiple gender options and improve data accuracy by allowing individuals to accurately report their gender identity. The results emphasize the importance of distinguishing between sex assigned at birth, gender identity, and gender expression in research. This ensures that gender diversity is accurately represented and considered, improving the relevance and inclusivity of clinical trials.

KEYWORDS

expert study, diversity, guidelines, LGTB+, LGBTQ+, gender, survey

1 Introduction

Randomized controlled trials (RCTs) are considered the gold standard in clinical research for investigating the course and progression of diseases and establishing treatment efficacy (1, 2). They represent an opportunity to improve both the health and healthcare of people worldwide. In each clinical study, data are collected from a particular group of patients with a specific focus on interventions. The patient selection significantly impacts the quality of the data obtained. For clinical studies to be as broadly applicable as possible to a large patient population, studies must be designed in a manner that allows their results to be extrapolated to a diverse patient cohort (3).

There is increasing evidence indicating that different subgroups of patients respond differently to treatment. Moreover, disease courses may vary among distinct patient groups due to factors such as sex, genetic background, age, and race (4, 5) to name but a few factors. Examples of such varying treatment responses and disease occurrences include the observation of higher levels of some of the commonly used antiretroviral agents in the treatment of the human immunodeficiency virus (HIV) in diverse groups, which can lead to higher concentrations and thus improved efficacy, but in other cases be linked to increased adverse events (6). Another example is the evidence showing that transgender adolescents have a higher risk of suicidality compared to cisgender adolescents (7–9).

If medical research aims to produce results that can foster efficient, equitable, and safe healthcare for all, underrepresented groups, such as sexual and/or gender minorities (SGM), must also be represented in clinical studies. On the one hand, awareness concerning the importance of various social and diversity-related determinants of health is increasing in global research (10, 11). At the same time, research shows that certain groups are still underrepresented in clinical studies (12–15). For instance, disparities in the occurrence and distribution of brain tumors among various ethnic groups suggests distinct genetic and hereditary influences on tumor development that clinical trials often fail to include by not treating race as a reported factor. As shown by Taha et al. (15), only 27% of published drug- and biological-based clinical trials reported on race and/or ethnicity in an analysis of North American brain tumor studies. Moreover, clinical drug trials continue to lack female research participants, who account for only one third of participants in clinical trials published (16). This highlights that current issues in diversity-sensitive research that not only lacks of representation of certain cohorts but also uses inconsistent assessment of diversity-specific characteristics.

There has been some progress in designing more inclusive trials regarding characteristics such as race and ethnicity (17, 18). Concerning health determinants such as sex and gender, the launch of the "Sex and Gender Equity in Research" (SAGER) guidelines in 2016 was a significant step in encouraging the systematic reporting of sex and gender in health research (19). Sex is defined as "based on external genitalia, with consideration given to other factors in cases of ambiguity" (20), while gender refers to "a person's internal sense of their identity of being a boy, a man, or male, a girl, a woman, or female, or an alternative gender such as genderqueer, gender nonconforming, gender neutral, that may or may not align with the sex assigned at birth or secondary sex characteristics" (20). Today, it is recommended to use "male/female/intersex" in reference to sex and boy/girl or man/woman or gender diverse person in reference to gender. While there is some evidence regarding differences in disease pathomechanisms, disease manifestation, and treatment responses that may be attributed to sex (assigned at birth), the incorporation of aspects around gender may add an important complementary dimension to understanding variability in clinical presentation and therapy outcomes – especially in social sciences, thus in areas addressing psychological and socio-cultural influences on health and disease.

Most scientific journals still lack reporting guidelines regarding sex and gender diversity (21). In addition, sex and gender-based analyses are inadequately investigated in medical research, as evidenced by a text-mining analysis of 8,836 articles across nine clinical subspecialties where all disciplines – with the exception of cardiology – demonstrated an underrepresentation (less than 20% distribution) of research about gender differences in clinical management (22). Despite increasing awareness of the importance of implementing sex and gender into health research, uncertainty persists regarding the definition and use for these concepts. Sex and gender are often used interchangeably in scientific papers (23–25), although they are distinct and non-interchangeable terms (26). Conventional approaches describing clinical trial populations solely based on sex assigned at birth may overlook factors linked to disease risk.

Beyond sex and gender considerations, members of the LGBTQIA+ (lesbian, gay, bisexual, transgender, queer, intersex, asexual) community continue to be overlooked in trial designs. Consider the following: transgender patients have four times higher rates of receiving a mental health diagnosis than cisgender patients (27). Due to the higher exposure to stigma and prevalence of mental health concerns compared to cisgender individuals (27–29), transgender individuals represent a population susceptible to adverse mental health. The perceived or actual social stigma and discrimination these individuals experience may significantly impact their willingness and ability to access appropriate medical care, constituting a critical barrier to healthcare (30, 31). Additionally, their experienced social stigma is associated with psychological distress (28). Therefore, a binary measurement of sex or gender excludes transgender and intersex individuals and misses the opportunity to develop health measures for a gender-diverse patient group (29) with unique health and wellness needs.

Notably, there are variations in the dimensions of sex, gender, and sexual orientation that different sex/gender measures are able to capture. Existing measures, such as the two-step method (32), capture three dimensions of sex and gender: sex assigned at birth, current gender identity, and transgender status (through cross-classification), and have been rated as effective and easy to identify transgender participants in population studies (32–36). Despite this, when employing two-step gender measures, several challenges may arise, including the lack of collecting additional dimensions of

gender [e.g., gender expression, which "refers to how an individual communicates their gender through behaviors, attire, communication styles, and interests, within the context of their culture" (37)] and/or inadequate response options for adolescents who are gender nonconforming or questioning (36) as well as sexual orientation variables.

Growing evidence underscores the relevance of gender expression as a health determinant; however, data on this topic remain scarce, representing untapped potential for advancing population health (38). Researchers emphasize that incorporating measures of gender expression into surveys is essential for capturing the diverse ways people experience gender and for understanding how gender inequality influences life opportunities and health outcomes (39, 40). Gender expression can vary over time and context and is especially critical as an emerging health determinant for children (38, 41, 42). For example, Gordon et al. (43) identified gender expression as a risk indicator for disordered weight control behaviors, particularly among adolescent boys perceived as more feminine, who may face stigma for defying societal gender norms. Some studies link feminine behaviors to better health outcomes and masculine behaviors to poorer health (44). The intersection of gender expression and identity is vital for health; masculinity has been associated with better self-rated health in cisgender men, while femininity has been linked to better self-rated health in cisgender women (40). As another example, Samulowitz et al. (45) demonstrated that gendered norms shape not only how men and women experience and express pain but also how healthcare providers respond to it. Thus, to enhance understanding of the health implications tied to gender expression and identity, inclusive and comprehensive measures are essential in research.

One solution involves incorporating additional response options such as genderqueer and other relevant categories, or using multidimensional measures of sex and gender (46). Stadler et al. (47) suggest incorporating a "prefer not to answer" choice to offer respondents more flexibility in their responses, refrain from using the term "other", and to include an open-ended option for individuals to self-identify as they please. Additionally, they suggest utilizing a list containing multiple categories (e.g., nonbinary) to achieve a balance between recognition, inclusivity, and practicality. The remaining challenges when measuring sex, gender, and sexual orientation include determining the number of categories, deciding whether categorical versus dimensional assessments are preferable, and ensuring that the terms used are not only comprehensible to patients but also broadly accepted by the respective individuals identifying as such.

The current inadequacy in the representation of sex, gender, and sexual orientation along with the methods for assessing these parameters highlights the need for further research in this field. The present study aims to examine the understanding and usability of existing definitions through a two-staged online survey involving international experts in the field of sex and gender diversity research. Based on this survey, we present insights on assessing sex, gender, and gender expression in clinical studies that may inform future research and practice, regardless of the specific research question.

2 Material and methods

2.1 Search strategy and eligibility criteria for experts

As this is a survey of experts, the study was exempted from ethics approval on January 3rd, 2022, by the Ethics Committee of the Medical Faculty of the Ruhr-University Bochum (AZ 2022-883). The study was prospectively registered with AsPredicted under application #12423.

A search of published literature was conducted in PubMed using the keywords "gender" or "sex" or "measure(-ment)" and "operationalization" to identify experts in the field. No restrictions were applied regarding journal, time period, or geographic origin of the publication. Ultimately, articles published between 2003 and 2021 were included. The reference lists of included articles were also hand-searched for additional relevant literature, and experts were asked to recommend additional experts who were invited to participate in the survey. In total, 45 experts were initially chosen based on the literature search, and an additional 55 were included (see Figure 1). As both the first and last authors were assumed to possess expertise – with the first author leading e.g., data collection and analysis, and the last author guiding e.g., study design, and providing insights as regards contents –the first and last authors of publications on sex and gender diversity in medical research were identified through literature search and invited to participate in the survey.

2.2 Questionnaire

The questionnaire used in the survey was developed based on the clinical and scientific expertise of the study team (30, 48, 49), a review of the literature, and the definitions of the American Psychological Association regarding the different concepts under investigation (20). Initially, the first author designed the questionnaire, which was then revised and consented to by the entire study team. This process involved evaluating the strengths and weaknesses of items, and ensuring that instructions, questions, and response options were presented in an inclusive manner.

The questionnaire used in the first survey consisted of five sections, three of them focusing on the concepts of 1) sex, 2) gender, and 3) gender expression. Each part was designed equally and comprised a total of 42 items, resulting in a total of 138 items for the entire questionnaire. The fourth part consisted of a presentation of existing measures, and experts were asked to specify their familiarity with them. The fifth part was used to collect socio-demographic information about the experts.

The definitions, which were first presented for each construct, were sourced from the American Psychological Association (APA) "Guidelines for Psychological Practice with Transgender and Gender Nonconforming People" (20). Experts were asked to indicate their level of agreement with these definitions ("strongly disagree", "moderately disagree", "moderately agree", "strongly agree") and to suggest any changes or additions. Their feedback was considered and incorporated into the re-evaluated definitions in the second round of the survey. According to the APA guidelines, sex is typically determined at birth based on the external genitalia

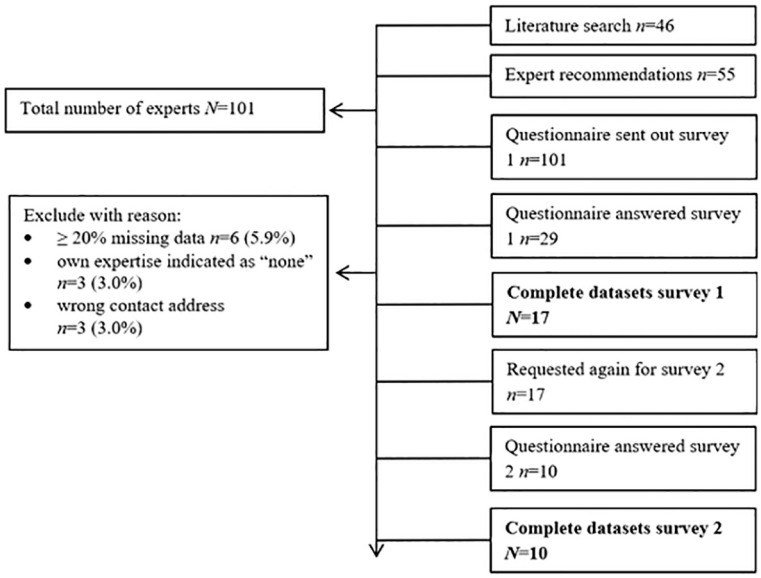


FIGURE 1
Flow Chart.

and may involve other factors in cases of ambiguity. It acknowledges that for transgender and gender nonconforming individuals, there may be discrepancies between biological sex and gender identity. Gender identity is defined as an individual's internal, deeply felt sense of being boy/man, girl/woman, or another gender identity, which may not be outwardly apparent to others. Gender expression is described as encompassing how an individual communicates their gender through actions and behaviors, such as clothing choices, communication styles, and interests.

After establishing these definitions, experts were tasked with rating the importance and practicality of assessing these concepts in clinical trials using a rating scale ("not at all", "slightly", "mostly", "extremely"). Additionally, they were asked to evaluate the suitability of various terms (e.g., "female", "trans man", and "nonbinary") for assessing these concepts, using a scale ranging from "not suitable" to "very suitable". Furthermore, experts were prompted to assess the ease of understanding these terms, ranging from "very difficult" to "very easy".

In the subsequent section of the questionnaire, experts were prompted to specify their familiarity with existing gender assessment tools, categorizing their knowledge as either "known and used", "known but not used", or "not known". These measures included the "two-step method" (32), the "Multidimensional Test Measure" (46), and the "Gender Identity Scale" (50). Following this, the experts were asked to assess the consideration of additional concepts such as "sexual orientation", "romantic orientation", and "sexual behaviors" in clinical studies that evaluate sex, gender, and/or gender expression.

To allow experts to identify any overlooked aspects, open-ended questions were incorporated into various sections of the survey (e.g., "please indicate whether you would add any term that describes gender that has not been listed here but should be included"). Additionally, the survey concluded by gathering information on the sociodemographic characteristics of the experts, their proficiency in the English language, and their level of (clinical) experience with gender and sex related research, with response options ranging from "none" (those participants were then excluded) to "a great deal".

The second round of the questionnaire incorporated questions from the first version of the questionnaire that did not achieve consensus (see section 2.3), along with new questions derived from the feedback and comments provided by the experts (e.g., "I am not Indigenous myself, but I have seen lists that include Two Spirit"), resulting in a total of 115 items. The second questionnaire did not re-query sociodemographic information.

2.3 Consensus and multi-step survey

The first questionnaire was sent to 101 experts on March 20th, 2023, via an invitation email that included a link to the online survey. A reminder was sent on April 21st. A total of 29 questionnaires were answered in the first survey (response rate: 28.7%), which was closed on May 24th. We included 17 complete datasets for survey 1 (see Figure 1 for reasons). The second questionnaire was then revised based on the experts' comments and consensus analyses and was distributed on July 17th, 2023, to all 17 experts with complete datasets. Reminders were sent after four weeks. The second survey was closed on September 8th. The response rate in the second survey was 58.8%.

Aligned with other expert studies (e.g., 51–53), the consensus criteria were established at 70% agreement or disagreement for dichotomized responses (e.g., very suitable/suitable and less suitable/not suitable). Items that reached consensus (agreement ≥70%) in the first survey were not included in the second survey and were implemented in the final results. Items that were rejected (disagreement ≥70%) were also removed and not included in the final recommendations. Alongside each item lacking consensus (<70%

10.3389/fpsyt.2024.1448487

agreement/>70% disagreement), anonymized group responses from the first survey were provided (e.g., "5.9% answered very suitable, 17.6% suitable, 35.3% less suitable, 41.2% not suitable in the first survey"). Based on these group responses, every expert was asked to re-rate questions that did not reach consensus again and give their opinion on additional questions marked as new (e.g., "New question: Which of the pairs of terms would you prefer when asking about sex assigned at birth?") that were added based on the experts' comments.

3 Results

3.1 Experts

Figure 1 depicts the expert flow of both survey rounds. The sociodemographic characteristics of the experts (assessed in survey 1) are shown in Table 1.

3.2 Sex assigned at birth

Fourteen out of 17 experts (82.4%) agreed on the importance of independently assessing the sex assigned at birth in clinical trials, regardless of the research question (out of 17 experts: 41.2%, n=7 answered "extremely"; 41.2%, n=7 answered "mostly"; 11.8%, n=2 answered "slightly", 5.9%, n=1 answered "not at all").

TABLE 1 Sociodemographic variables.

Variables	*N* = 17 *n* (%)
English skills	
Native/Bilingual	9 (52.9)
Full professional proficiency	3 (17.6)
Professional working proficiency	5 (29.4)
Level of expertise/knowledge to gender/sex related research	
A great deal	8 (47.1)
Quite a bit	6 (35.3)
A moderate amount	3 (17.3)
Age; mean *(SD)*	40.1 (10.9)
Community Member	
Yes	11 (68.8)
No	5 (31.3)
Gender (multiple answers possible)	
Ciswoman/Female/Woman	8 (40.0)
Male/Man	5 (25.0)
Genderqueer/Queer	2 (15.0)
Nonbinary	2 (10.0)
No category	1 (5.0)
Two Spirit	1 (5.0)
Area of profession	
Psychology	5 (29.4)
Medicine	2 (11.8)
Public health	3 (17.6)
Other (no specification)	7 (41.2)
Concrete field of work (multiple answers possible)	
Addiction and mental health	1 (5.6)
(Affective) neuroscience/ neuroendocrinology/biopsychology	3 (16.7)
Clinical psychology	1 (5.6)
Gender/sexuality/social psychology	3 (16.7)
Sociology	1 (5.6)
Pediatrics	1 (5.6)
Psychiatry	1 (5.6)
(Health equity) research (funding, methods, data)	4 (22.2)
Teaching/Health science education	2 (11.1)
Knowledge translation	1 (5.6)
Country of work	
Canada	9 (52.9)
Germany	1 (5.9)
Switzerland	1 (5.9)
USA	6 (35.3)

The definition of the APA (20) underwent adjustments in the first step based on comments received and was then re-evaluated in the second survey. Consensus was reached by eight out of ten experts (80%) on the acceptability of the revised definition for sex assigned at birth:

> "Sex assigned at birth may be seen as an epistemological construction and a form of classification that assumes a binary since it is mostly based on the appearance of the external genitalia. The term "sex assigned at birth" may also be misleading, as sex is often identified during pregnancy, recognized at birth and then entered accordingly as legal sex in legal documents (e.g., birth certificate). A recognition of sex at birth that is based on the appearance of the external genitalia only, disregards the fact that sex is multifaceted and that next to organ-based sex (internal and external organ development), also chromosome-based sex (presence or absence of the SRY region) and endocrinological sex (relative proportion of sex hormones levels) and other biological sex-based factors may depict categories to categorize sex beyond the binary. When the external genitalia appear ambiguous in regard to the usual binary phenotypes of male or female and/or there is an incongruence between the recognition of external genitalia and other sex-related aspects (e.g., internal genitalia,

> chromosomes), individuals are considered intersex or people with variations in sexual characteristics. For most individuals, sex determination based on the external genitalia and the binary male/female distinction is in congruence with gender identity later in life. Still, it is important to acknowledge intersex conditions, as well as trans* and non-binary/gender non-conforming individuals whose gender identity varies from the sex attributed to them at birth."

At this juncture, it is important to note that some experts have remarked, in response to the revised definition, that it remains too complex and may need further simplification, if deemed necessary.

There was no consensus on how sex assigned at birth should be assessed in either the first survey (out of 16 experts: 43.8%, n=7 answered "categorically"; 37.5%, n=6 answered "dimensionally"; 18.8%, n=3 answered "other") or the second survey (out of ten experts: 50.0%, n=5 answered "categorically"; 30.0%, n=3 answered "multi-dimensionally"; 20.0%, n=2 answered "with an open field"). However, there was a consensus that sex assigned at birth should be collected with the statement "Please specify your sex" (nine out of ten experts; 90.0% consensus in the second survey). Table 2 presents the results on the suitability and understandability of terms for the assessment of sex assigned at birth.

3.3 Gender (identity)

The experts agreed in their majority (14 out of 16 experts, 87.6%) that it is important to assess the gender (identity) of participants in clinical trials independently of the research question (out of 16 experts: 56.3%, n=9 answered "extremely"; 31.3%, n=5 answered "mostly"; 12.5%, n=2 answered "slightly"). The revision of the definition of gender (identity) of the APA (20) received approval from nine out of ten experts (90%):

> "Gender identity may be seen as a social construct describing a person's internal sense of self that is not necessarily visible to others, may be subject to change over time and lie beyond the man/woman binary, thus corresponding or not to an individual's sex at birth. Cisgender refers to people for whom their sex assigned at birth corresponds with their gender identity. Transgender or trans* and/or nonbinary people refer to those for whom sex assigned at birth does not correspond with their gender identity or a binary conceptualization of gender identity. Gender is a broader social and cultural construct that does not only include gender identity (self-identification) but also other aspects such as gender norms, gender relations, gender roles, and gender stereotypes operate across society at the intersection of other systems of hierarchical power such as race and class."

There was no agreement on the question of how gender (identity) should be assessed in either the first (out of 16 experts: 25.0%, n=4 answered "categorically"; 43.8%, n=7 answered "dimensionally"; 31.3%, n=5 answered "other") or the second survey (out of ten experts: 10.0%, n=1 answered "categorically"; 20.0%, n=2 answered "multi-dimensionally"; 20.0%, n=2 answered "with an open field"; 40.0%, n=4 answered "multiple-step questions"; 10.0%, n=1 answered "with a mix of categories"). However, there was a consensus that gender should be collected with the statement "I identify as…?" (seven out of ten experts, 70.0% consensus in the second survey). Table 3 shows the results on the suitability and understandability of terms for the assessment of gender (identity).

In an effort to potentially streamline the numerous suitable terms, umbrella terms were also explored in the second survey, but none achieved consensus as suitable (see Supplementary Table S1).

There was agreement that gender ("a person's internal sense of their identity of being a boy, a man, or male, a girl, a woman, or female, or an alternative gender" (20);) and gender identity (as a social construct describing a person's internal sense of self that is not necessarily visible to others, may be subject to change over time and lie beyond the man/woman binary) should be regarded as distinct constructs (eight out of ten experts, 80.0% in the second survey). Additionally, nine out of ten experts (90%) concurred that the terms "woman/man" are more fitting than "female/male", but there was no consensus on whether "cis woman/cis man" are preferable to "women/men" (five out of ten experts, 50.0%, respectively). The experts expressed the view that "trans woman/trans man" (seven out of nine experts, 77.8%) should be employed instead of the term "transgender" in general (two out of nine experts, 22.2%).

3.4 Gender expression

The experts were unsure whether the assessment of gender expression of participants in clinical trials is important regardless of the research question (out of 16 experts: 43.8%, n=7 answered "mostly"; 37.5%, n=6 answered "slightly"; 18.8%, n=3 answered "not at all"). The refined definition of gender expression from the APA (20) received 100% approval by all of the ten experts:

> "Gender expression refers to the way an individual, intentionally or not, communicates or is perceived as communicating their gender within a given culture, for example, in terms of clothing, communication patterns, and interests. Gender expression implies cultural norms and thus differs across the world. An individual's gender expression may or may not reflect their gender identity. In addition, gender expression may or may not be consistent with socially specified gender constructs – the latter possibly depicting a factor of stress for the individual who expresses themselves in a gender non-confirming way."

There was no agreement on how gender expression should be assessed in either the first (out of 16 experts: 12.5%, n=2 answered "categorically"; 56.3%, n=9 answered "dimensionally"; 31.3%, n=5 answered "other") or the second survey (out of ten experts: 40.0%, n=4 answered "categorically"; 40.0%, n=4 answered "multi-dimensionally"; 20.0%, n=2 answered "with an open field"). Additionally, there was no consensus on how gender expression

TABLE 2 Suitability and understandability of terms for the assessment of sex assigned at birth.

How suitable are the following terms to assess the sex of patients or participants in clinical and other research studies?								
Terms	First survey				Second survey			
	Answer Scale							
	Very suitable n (%)	Suitable n (%)	Less suitable n (%)	Not suitable n (%)	Very suitable n (%)	Suitable n (%)	Less suitable n (%)	Not suitable n (%)
Female[a]	13 (76.6)	4 (23.5)	–	–	–	–	–	–
Male[a]	13 (76.6)	4 (23.5)	–	–	–	–	–	–
Intersex[a]	11 (64.7)	4 (23.5)	2 (11.8)	–	–	–	–	–
Diverse[a]	3 (17.6)	1 (5.9)	4 (23.5)	9 (52.9)	–	–	–	–
Woman[b]	1 (5.9)	6 (35.3)	2 (11.8)	8 (47.1)	1 (10.0)	–	1 (10.0)	8 (80.0)
Man[b]	1 (5.9)	6 (35.3)	2 (11.8)	8 (47.1)	1 (10.0)	–	1 (10.0)	8 (80.0)
Transgender[a]	2 (11.8)	1 (5.9)	4 (23.5)	10 (58.8)	–	–	–	–
Trans woman[a]	2 (11.8)	1 (5.9)	4 (23.5)	10 (58.8)	–	–	–	–
Trans man[a]	2 (11.8)	1 (5.9)	4 (23.5)	10 (58.8)	–	–	–	–
Trans-masculine[a]	2 (11.8)	2 (11.8)	2 (11.8)	11 (64.7)	–	–	–	–
Trans-feminine[a]	2 (11.8)	2 (11.8)	2 (11.8)	11 (64.7)	–	–	–	–
Nonbinary[a]	3 (17.6)	2 (11.8)	2 (11.8)	10 (58.8)	–	–	–	–
Genderqueer[a]	2 (11.8)	1 (5.9)	3 (17.6)	11 (64.7)	–	–	–	–
Genderfluid[a]	2 (11.8)	1 (5.9)	3 (17.6)	11 (64.7)	–	–	–	–
Agender[a]	2 (11.8)	1 (5.9)	3 (17.6)	11 (64.7)	–	–	–	–
Something other than male or female[b]	2 (11.8)	4 (23.5)	3 (17.6)	8 (47.1)	–	1 (10.0)	2 (20.0)	7 (70.0)
Sometimes male, sometimes female[a]	1 (5.9)	–	3 (17.6)	13 (76.5)	–	–	–	–
Person with vagina[b,c]	–	–	–	–	3 (30.0)	1 (10.0)	1 (10.0)	5 (50.0)
Person with uterus[b,c]	–	–	–	–	3 (30.0)	2 (20.0)	–	5 (50.0)
Person with penis[b,c]	–	–	–	–	3 (30.0)	1 (10.0)	1 (10.0)	5 (50.0)
How easy to understand are the following terms when assessing sex?								
	Answer Scale							
	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)
Female[a]	15 (88.2)	1 (5.9)	1 (5.9)	–	–	–	–	–
Male[a]	15 (88.2)	1 (5.9)	1 (5.9)	–	–	–	–	–
Intersex[b]	4 (23.5)	6 (35.3)	6 (35.3)	1 (5.9)	4 (40.0)	3 (30.0)	3 (30.0)	–
Diverse[a]	–	2 (11.8)	7 (41.2)	8 (47.1)	–	–	–	–
Woman[a]	8 (47.1)	4 (23.5)	3 (17.6)	2 (11.8)	–	–	–	–
Man[a]	8 (47.1)	4 (23.5)	3 (17.6)	2 (11.8)	–	–	–	–
Transgender	3 (17.6)	5 (29.4)	6 (35.3)	3 (17.6)	1 (10.0)	4 (40.0)	1 (10.0)	4 (40.0)
Trans woman[b]	2 (11.8)	4 (23.5)	8 (47.1)	3 (17.6)	1 (10.0)	6 (60.0)	2 (20.0)	1 (10.0)
Trans man[a]	2 (11.8)	3 (17.6)	9 (52.9)	3 (17.6)	–	–	–	–

(Continued)

TABLE 2 Continued

How easy to understand are the following terms when assessing sex?								
	Answer Scale							
	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)
Trans-masculine[a]	1 (5.9)	1 (5.9)	11 (64.7)	4 (23.5)	–	–	–	–
Trans-feminine[a]	1 (5.9)	1 (5.9)	11 (64.7)	4 (23.5)	–	–	–	–
Nonbinary[b]	–	6 (35.3)	6 (35.3)	5 (29.4)	1 (10.0)	1 (10.0)	4 (40.0)	4 (40.0)
Genderqueer[a]	–	1 (5.9)	9 (52.9)	7 (41.2)	–	–	–	–
Genderfluid[a]	–	–	9 (52.9)	8 (47.1)	–	–	–	–
Agender[a]	–	1 (5.9)	8 (47.1)	8 (47.1)	–	–	–	–
Something other than male or female	2 (11.8)	5 (29.4)	5 (29.4)	5 (29.4)	2 (20.0)	3 (30.0)	4 (40.0)	1 (10.0)
Sometimes male, sometimes female[a]	1 (6.3)	2 (12.5)	7 (43.8)	6 (37.5)	–	–	–	–

Terms in bold achieved a consensus of ≥70% in one of the two surveys, [a]terms reached a consensus in survey 1 and were not queried again, [b]terms reached a consensus in survey 2, [c]terms were requested by the experts and were newly introduced in the 2nd survey.

should be assessed, neither in the first (out of 17 experts: 11.8%, n=2 answered "I identify as…?"; 11.8%, n=2 answered "I describe myself as…"; 35.3%, n=6 answered "I live as…"; 41.2%, n=7 answered "open text field") nor in the second survey (out of ten experts: 10.0%, n=1 answered "I describe myself as…"; 40.0%, n=4 answered "I express myself as…"; 50.0%, n=5 answered "open text field"). Table 4 presents the results on the suitability and understandability of terms for the assessment of gender expression.

3.5 Other dimensions and measures

The experts agreed that studies that assess sex assigned at birth, gender (identity) and/or gender expression should also consider sexual orientation and sexual behavior (out of 15, eleven experts [73.3%] answered "yes" in the first survey, respectively) as well as romantic orientation (out of ten, seven experts [70%] answered "yes" in the second survey).

There was no consensus regarding the degree of familiarity or recommended use of the measures presented (see Supplementary Table 2).

3.6 Diversity-oriented recommendations for clinical studies

The following provides a summary of the diversity-oriented recommendations for assessing sex, gender, and gender expression in clinical trials based on insights gathered from 17 international experts. While only aspects that reached a consensus are included, it is important to note that those that did not achieve consensus are not featured in this summary. Experts also indicated that studies surveying the constructs of sex (assigned at birth), gender (identity), and/or gender expression should include assessments of sexual orientation, romantic orientation, and sexual behaviors.

3.6.1 Sex (assigned at birth)

In clinical research, experts recommend assessing sex assigned at birth regardless of the research question. Participants should be prompted with the statement "Please specify your sex (assigned at birth)", followed by the options: "Female", "Male", and "Intersex".

3.6.2 Gender (identity)

In clinical research, experts also recommend assessing gender (identity) irrespective of the research question. Participants should be prompted with the statement "I identify as…", followed by the options: "Woman", "man", "Nonbinary", "Trans woman", "Trans man", "Genderqueer", "Genderfluid", "Agender", and "Two Spirit".

3.6.3 Gender expression

Based on the experts' ratings, the assessment of gender expression depends on the research question and may not be relevant for every study. While no specific statement is recommended for assessing gender expression, the following options should be provided, if a categorical assessment is chosen: "Genderfluid", "Androgynous", "Mostly masculine", "Mostly feminine", "Somewhat masculine", "Somewhat feminine", and "Neither feminine nor masculine". As noted by the experts, gender expression may also be assessed dimensionally, with the opposite poles labeled as "feminine" and "masculine".

4 Discussion

4.1 Discussion of main findings

The aim of this study was to refine current definitions and gather insights on assessing sex assigned at birth, gender (identity), and gender expression in clinical studies independently of the

TABLE 3 Suitability and understandability of terms for the assessment of gender (identity).

How important is assessing the gender of patients or participants in clinical research independent of the research questions?								
Terms	First survey				Second survey			
	Answer Scale							
	Very suitable n (%)	Suitable n (%)	Less suitable n (%)	Not suitable n (%)	Very suitable n (%)	Suitable n (%)	Less suitable n (%)	Not suitable n (%)
Female[a]	1 (5.9)	3 (17.6)	6 (35.3)	7 (41.2)	–	–	–	–
Male[a]	1 (5.9)	3 (17.6)	6 (35.3)	7 (41.2)	–	–	–	–
Intersex[a]	1 (5.9)	1 (5.9)	4 (23.5)	11 (64.7)	–	–	–	–
Diverse	5 (29.4)	4 (23.5)	4 (23.5)	4 (23.5)	1 (10.0)	4 (40.0)	2 (20.0)	3 (30.0)
Woman[a]	12 (70.6)	5 (29.4)	–	–	–	–	–	–
Man[a]	12 (70.6)	5 (29.4)	–	–	–	–	–	–
Transgender[b]	8 (47.1)	3 (17.6)	4 (23.5)	2 (11.8)	3 (30.0)	4 (40.0)	1 (10.0)	2 (20.0)
Trans woman[a]	8 (47.1)	9 (52.9)	–	–	–	–	–	–
Trans man[a]	8 (47.1)	9 (52.9)	–	–	–	–	–	–
Trans-masculine[a]	5 (29.4)	8 (47.1)	4 (23.5)	–	–	–	–	–
Trans-feminine[a]	5 (29.4)	8 (47.1)	4 (23.5)	–	–	–	–	–
Nonbinary[a]	11 (64.7)	4 (23.5)	2 (11.8)	–	–	–	–	–
Genderqueer[a]	10 (58.8)	5 (29.4)	2 (11.8)	–	–	–	–	–
Genderfluid[a]	10 (58.8)	5 (29.4)	2 (11.8)	–	–	–	–	–
Agender[a]	10 (58.8)	4 (23.5)	3 (17.6)	–	–	–	–	–
Something other than male or female[a]	1 (5.9)	2 (11.8)	6 (35.3)	8 (47.1)	–	–	–	–
Sometimes male, sometimes female[a]	1 (5.9)	4 (23.5)	5 (29.4)	7 (41.2)	–	–	–	–
Two spirit[b,c]	–	–	–	–	6 (60.0)	2 (20.0)	–	2 (20.0)
Cis man[c]	–	–	–	–	4 (40.0)	2 (20.0)	3 (30.0)	1 (10.0)
Cis woman[c]	–	–	–	–	4 (40.0)	2 (20.0)	3 (30.0)	1 (10.0)
No identification[c]	–	–	–	–	3 (30.0)	3 (30.0)	2 (20.0)	2 (20.0)
How easy to understand are the following terms when assessing gender?								
	Answer Scale							
	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)
Female	3 (17.6)	7 (41.2)	3 (17.6)	4 (23.5)	2 (20.0)	3 (30.0)	3 (30.0)	2 (20.0)
Male	3 (17.6)	7 (41.2)	3 (17.6)	4 (23.5)	2 (20.0)	3 (30.0)	3 (30.0)	2 (20.0)
Intersex[a]	–	4 (23.5)	6 (35.3)	7 (41.2)	–	–	–	–
Diverse	2 (11.8)	5 (29.4)	5 (29.4)	5 (29.4)	–	5 (50.0)	2 (20.0)	3 (30.0)
Woman[a]	12 (70.6)	4 (23.5)	1 (5.9)	–	–	–	–	–
Man[a]	12 (70.6)	4 (23.5)	1 (5.9)	–	–	–	–	–
Transgender[b]	4 (23.5)	5 (29.4)	7 (41.2)	1 (5.9)	2 (20.0)	5 (50.0)	2 (20.0)	1 (10.0)

(Continued)

TABLE 3 Continued

How easy to understand are the following terms when assessing gender?								
	Answer Scale							
	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)
Trans woman[a]	7 (41.2)	7 (41.2)	2 (11.8)	1 (5.9)	–	–	–	–
Trans man[a]	7 (41.2)	7 (41.2)	2 (11.8)	1 (5.9)	–	–	–	–
Trans-masculine[b]	3 (17.6)	3 (17.6)	9 (52.9)	2 (11.8)	5 (50.0)	3 (30.0)	1 (10.0)	1 (10.0)
Trans-feminine[b]	3 (17.6)	3 (17.6)	9 (52.9)	2 (11.8)	5 (50.0)	3 (30.0)	1 (10.0)	1 (10.0)
Nonbinary[a]	6 (35.3)	6 (35.3)	4 (23.5)	1 (5.9)	–	–	–	–
Genderqueer[b]	3 (17.6)	5 (29.4)	8 (47.1)	1 (5.9)	4 (40.0)	3 (30.0)	3 (30.0)	–
Genderfluid	4 (23.5)	3 (17.6)	9 (52.9)	1 (5.9)	4 (40.0)	2 (20.0)	4 (40.0)	–
Agender	4 (23.5)	3 (17.6)	6 (35.3)	4 (23.5)	3 (30.0)	1 (10.0)	5 (50.0)	1 (10.0)
Something other than male or female[a]	1 (5.9)	3 (17.6)	5 (29.4)	8 (47.1)	–	–	–	–
Sometimes male, sometimes female[a]	2 (11.8)	3 (17.6)	4 (23.5)	8 (47.1)	–	–	–	–

Terms in bold achieved a consensus of >70% in one of the two surveys, [a]terms reached a consensus in survey 1 and were not queried again, [b]terms reached a consensus in survey 2, [c]terms were requested by the experts and newly introduced in the 2nd survey.

research question. Through an expert survey, we sought to formulate recommendations for these diversity-related assessments. To achieve this, a two-staged online survey was conducted with 17 international experts in the field of sex and gender diversity research. The results of the first survey were evaluated based on a consensus criterion (70% as the threshold for agreement/disagreement), and items without consensus were queried again in a second survey that provided the group responses of survey 1. In addition, the second survey included further, new aspects that the experts were able to add in the first survey to ensure that no aspect was left out.

The experts agreed that it is essential to evaluate both sex assigned at birth and gender (identity), regardless of the research question. There was also a consensus that sex assigned at birth should be assessed by asking participants "please specify your sex" using the following categories: "male", "female" and "intersex". Furthermore, there was a consensus that gender (identity) should be assessed by using the statement "I identify as…" in combination with these categories: "woman", "man", "nonbinary", "trans woman", "trans man", "genderqueer", "genderfluid", "agender" and "Two Spirit". In addition, there was agreement that gender and gender identity should be regarded as separate entities.

These results, similar to previous studies (36, 47), highlight that providing gender diverse options in surveys allows for a more inclusive approach, acknowledging the existence and experiences of gender minorities. By offering categories beyond binary options, such as including non binary identities, surveys demonstrate inclusivity and enhance the accuracy of data collection by enabling individuals to state their gender identity more accurately. In addition, our results to assess both sex assigned at birth and gender (identity) regardless of the research question and as independent constructs, align with previous research such as the use of a two-item approach (32, 34) rather than a single, stand-alone sex and/or gender (identity) item (35).

Experts indicated that whether gender expression should be assessed depends on the research question. Consequently, unlike sex assigned at birth and gender (identity), gender expression may not always be relevant. There was no consensus on whether gender expression should be assessed categorically or dimensionally. However, if a dimensional assessment was preferred, there was a consensus to label the poles as feminine/masculine. Unfortunately, there was no consensus on which statement should be used to assess gender expression as the experts expressed varied preferences regarding a specific statement in both the first and second surveys with options such as "I identify as", "I describe myself as", and "I live as". It was therefore only possible to provide recommendations for the answer categories ("genderfluid", "androgynous", "mostly masculine", "mostly feminine", "somewhat masculine", "somewhat feminine", "neither feminine nor masculine").

The difficulties experienced by the authors in reaching a consensus regarding aspects of gender expression could have been due to several reasons: on the one hand, the lack of power from only 17 experts, and on the other hand, the relatively limited attention towards the measurement of gender expression in current research, which predominantly concentrates on surveying gender (identity) (39). In addition, the existing APA definitions do not seem to have been comprehensible and/or appropriate, as we were able to achieve a high level of consensus after revising these definitions. Consensus

TABLE 4 Suitability and understandability of terms for the assessment of gender expression.

How important is assessing the gender of patients or participants in clinical research independent of the research questions?								
Terms	First survey				Second survey			
	Answer Scale							
	Very suitable n (%)	Suitable n (%)	Less suitable n (%)	Not suitable n (%)	Very suitable n (%)	Suitable n (%)	Less suitable n (%)	Not suitable n (%)
Female[a]	1 (5.9)	3 (17.6)	3 (17.6)	10 (58.8)	–	–	–	–
Male[a]	1 (5.9)	3 (17.6)	3 (17.6)	10 (58.8)	–	–	–	–
Intersex[a]	1 (5.9)	1 (5.9)	1 (5.9)	14 (82.4)	–	–	–	–
Diverse[b]	2 (12.5)	4 (25.0)	4 (25.0)	6 (37.5)	2 (20.0)	1 (10.0)	3 (30.0)	4 (40.0)
Woman[b]	5 (29.4)	6 (35.3)	2 (11.8)	4 (23.5)	2 (20.0)	1 (10.0)	2 (20.0)	5 (50.0)
Man[b]	5 (29.4)	6 (35.3)	2 (11.8)	4 (23.5)	2 (20.0)	1 (10.0)	2 (20.0)	5 (50.0)
Transgender[b]	2 (11.8)	5 (29.4)	4 (23.5)	6 (35.3)	–	–	4 (40.0)	6 (60.0)
Trans woman[b]	2 (11.8)	8 (47.1)	2 (11.8)	5 (29.4)	1 (10.0)	–	3 (30.0)	6 (60.0)
Trans man[b]	2 (11.8)	8 (47.1)	2 (11.8)	5 (29.4)	1 (10.0)	–	3 (30.0)	6 (60.0)
Trans-masculine	2 (11.8)	7 (41.2)	4 (23.5)	4 (23.5)	2 (20.0)	2 (20.0)	2 (20.0)	4 (40.0)
Trans-feminine	2 (11.8)	7 (41.2)	4 (23.5)	4 (23.5)	2 (20.0)	2 (20.0)	2 (20.0)	4 (40.0)
Nonbinary	3 (17.6)	5 (29.4)	6 (35.3)	3 (17.6)	4 (40.0)	3 (30.0)	–	3 (30.0)
Genderqueer	3 (17.6)	7 (41.2)	3 (17.6)	4 (23.5)	–	6 (60.0)	2 (20.0)	2 (20.0)
Genderfluid [b]	3 (17.6)	7 (41.2)	2 (11.8)	5 (29.4)	–	7 (70.0)	1 (10.0)	2 (20.0)
Agender[b]	3 (17.6)	5 (29.4)	3 (17.6)	6 (35.3)	1 (10.0)	2 (20.0)	4 (40.0)	3 (30.0)
Something other than male or female[a]	2 (11.8)	3 (17.6)	1 (5.9)	11 (64.7)	–	–	–	–
Sometimes male, sometimes female[a]	3 (17.6)	2 (11.8)	3 (17.6)	9 (52.9)	–	–	–	–
Androgynous[b,c]	–	–	–	–	6 (60.0)	3 (30.0)	–	1 (10.0)
Mostly feminine[b,c]	–	–	–	–	7 (70.0)	2 (20.0)	1 (10.0)	–
Mostly masculine[b,c]	–	–	–	–	7 (70.0)	2 (20.0)	1 (10.0)	–
Somewhat feminine[b,c]	–	–	–	–	7 (70.0)	2 (20.0)	1 (10.0)	–
Somewhat masculine[b,c]	–	–	–	–	7 (70.0)	2 (20.0)	1 (10.0)	–
Neither feminine nor masculine[b,c]	–	–	–	–	6 (60.0)	2 (20.0)	2 (20.0)	–
How easy to understand are the following terms when assessing gender?								
	Answer Scale							
	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)
Female[a]	2 (13.3)	2 (13.3)	4 (26.7)	7 (46.7)	–	–	–	–
Male[a]	2 (13.3)	2 (13.3)	4 (26.7)	7 (46.7)	–	–	–	–
Intersex[a]	–	2 (13.3)	1 (6.7)	12 (80.0)	–	–	–	–

(Continued)

TABLE 4 Continued

How easy to understand are the following terms when assessing gender?								
	Answer Scale							
	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)	Very easy n (%)	Moderately easy n (%)	Moderately difficult n (%)	Very difficult n (%)
Diverse[b]	1 (6.7)	4 (26.7)	3 (20.0)	7 (46.7)	–	2 (20.0)	3 (30.0)	5 (50.0)
Woman[a]	6 (40.0)	5 (33.3)	1 (6.7)	3 (20.0)	–	–	–	–
Man[a]	6 (40.0)	5 (33.3)	1 (6.7)	3 (20.0)	–	–	–	–
Transgender[b]	1 (6.7)	6 (40.0)	1 (6.7)	7 (46.7)	–	1 (10.0)	4 (40.0)	5 (50.0)
Trans woman[b]	3 (20.0)	4 (26.7)	4 (26.7)	4 (26.7)	1 (10.0)	1 (10.0)	5 (50.0)	3 (30.0)
Trans man[b]	3 (20.0)	4 (26.7)	4 (26.7)	4 (26.7)	1 (10.0)	1 (10.0)	5 (50.0)	3 (30.0)
Trans-masculine	1 (6.7)	5 (33.3)	6 (40.0)	3 (20.0)	1 (10.0)	4 (40.0)	3 (30.0)	2 (20.0)
Trans-feminine	1 (6.7)	5 (33.3)	6 (40.0)	3 (20.0)	1 (10.0)	4 (40.0)	3 (30.0)	2 (20.0)
Nonbinary	2 (13.3)	4 (26.7)	5 (33.3)	4 (26.7)	1 (10.0)	3 (30.0)	5 (50.0)	1 (10.0)
Genderqueer	–	5 (33.3)	6 (40.0)	4 (26.7)	1 (10.0)	4 (40.0)	4 (40.0)	1 (10.0)
Genderfluid	2 (13.3)	4 (26.7)	5 (33.3)	4 (26.7)	1 (10.0)	5 (50.0)	3 (30.0)	1 (10.0)
Agender[b]	–	5 (33.3)	3 (20.0)	7 (46.7)	–	2 (20.0)	5 (50.0)	3 (30.0)
Something other than male or female[a]	1 (6.7)	2 (13.3)	4 (26.7)	8 (53.3)	–	–	–	–
Sometimes male, sometimes female	1 (6.7)	4 (26.7)	2 (13.3)	(53.3)	1 (10.0)	4 (40.0)	4 (40.0)	1 (10.0)

Terms in bold achieved a consensus of >70% in one of the two surveys, [a]terms reached a consensus in survey 1 and were not queried again, [b]terms reached a consensus in survey 2, [c]terms were requested by the experts and newly introduced in the 2nd survey.

on the more tangible construct of sex assigned at birth was significantly higher than for gender (identity) and gender expression. We believe that this could indicate uncertainties with these constructs and highlight the need to formulate recommendations for data collection. Moreover, we found that studies that encompass the concepts of sex assigned at birth and gender (identity) should also survey sexual orientation, romantic orientation, and sexual behaviors. At the same time, while the representation of diversity aspects is important, we must acknowledge that assessments for research purposes need to be manageable (i.e., feasible in terms of study procedures) and to allow solid analyses (in terms of adequate statistical power for the groups under investigation). This could be another reason why aspects other than sex assigned at birth have not been included in a far-reaching manner in research so far.

It might also be relevant to include other aspects in the survey of gender expression such as the perception by others. For example, Wylie et al. (54) and The GenIUSS Group (36) suggested a two-item measure and included the question of how others would rate appearance, style, or clothing. Furthermore, there are suggestions for an additional extension with unipolar response scales (36, 39), which is consistent with our recommendations. Future research should aim to describe evidence gaps and ensure better representativeness of results by including gender specific populations. However, as already emphasized, it is also important to consider gender conformity/non conformity.

In terms of intersectionality, there are also several other aspects besides sex and/or gender impacting study applicability and results (3, 5, 14–16, 55, 56) most likely in a potentized, not always disambiguate way. These aspects, such as cultural background or ethnicity (e.g., 57, 58), significantly impact the mental health and well-being of individuals and should therefore be considered in research independently of the results presented here.

In contrast to other recommendations, such as the "Sex and Gender Equity in Research" (SAGER) guidelines (19), which primarily serve to standardize the reporting of sex and gender in research articles, our study addressed the preceding issue by focusing on the comprehensive assessment of these concepts. Recently, Stadler et al. (47) proposed a "Diversity Minimal Item Set" (DiMIS) to help close the diversity and gender gap. Concerning the concepts of sex assigned at birth and gender identity, the authors recommended using a single item which they adapted from the NHS England and LGBT Foundation (59), offering a range of gender diverse options, such as "nonbinary", "trans" and "questioning", consistent with our recommendations. In addition, the authors recommended to always provide the opportunity to self-identify; the possibility to opt out by including an option like "prefer not to answer" should also be considered.

In contrast to our study, existing guidelines did not include a recommendation for the assessment of gender expression. As such, we were also able to present consented definitions of the constructs. Additionally, our research emphasizes the integration of gender diverse populations into studies, a dimension that the "Sex and Gender Equity in Research" (SAGER) guidelines do not explicitly address. Therefore, our work adds a new perspective on including and assessing gender diverse populations. This aligns with other research that contends that including measures of gender expression in survey research is crucial for capturing the diverse ways in which gender is understood and experienced and in which gender inequality affects opportunities in life (40).

4.2 Limitations

Although this was the first project questioning international experts in the field of gender diversity on the assessment of sex, gender, and gender expression, we could only reach 17 experts from a total of four countries. The response rate in survey one was 26%, in survey two 50%. Although this may not seem like a large number at first, other expert studies show a similar number of participants (e.g., 53, 60). Nonetheless, the results should be interpreted with caution in view of the relatively small sample.

Another limitation concerns the background diversity of experts, as most were from either Canada or the United States of America. This is the result of our expert selection method, as only first and last authors mentioned in thematically relevant publications were included, in addition to the fact that not all experts accepted the invitation to participate in the study. As a result, it has not been possible to include the perspective of other countries in a sizeable part of the world, even though their perspectives would have most certainly been enriching. Therefore, our findings may not necessarily be suitable for all/further cultures and continental contexts. Also, vocabulary and use of the concepts under investigation may differ in diverse cultures or languages and may not be transferable, but experts were asked to give examples of alternative vocabulary in their respective native language – although no answers were given here. The 70% consensus threshold was determined arbitrarily; nevertheless, other studies have successfully employed the same cut-off point (51–53).

Of course, it is also a limitation that the suggestions presented here derived from researchers and have not yet been harmonized with LGBTQI+ community members, patients, or other key stakeholders, which would have provided valuable input for the formulation of practical recommendations. However, it is particularly important to emphasize that eleven out of 16 experts stated that they were part of diverse communities themselves.

5 Conclusion

This study offers definitions for sex assigned at birth, gender (identity), and gender expression that have been refined with input from experts, along with new diversity-oriented recommendations for clinical studies. By clarifying the definitions of the constructs, we aim to promote their more precise use in future clinical research. Standardized surveys could facilitate better comparisons of results and ensure that gender is recognized beyond binary expressions in clinical trials to improve the healthcare of SGM individuals.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics statement

The study was exempted from ethics approval by the Ethics Committee of the Medical Faculty of the Ruhr-University Bochum. The study were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

HH: Conceptualization, Data curation, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. NL: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Visualization, Writing – original draft, Writing – review & editing. R-PJ: Methodology, Resources, Validation, Writing – original draft, Writing – review & editing. GH: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. GP: Conceptualization, Methodology, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The reviewer MVLT declared a shared parent affiliation with the author(s) HRH, NML, GH, GP to the handling editor at the time of review.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2024.1448487/full#supplementary-material

References

1. Sackett DL, Rosenberg WMC, Gray JAM, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. (1996) 312:71–2. doi: 10.1136/bmj.312.7023.71

2. Umscheid CA, Margolis DJ, Grossman CE. Key concepts of clinical trials: A narrative review. *Postgrad Med*. (2011) 123:194–204. doi: 10.3810/pgm.2011.09.2475

3. Oh SS, Galanter J, Thakur N, Pino-Yanes M, Barcelo NE, White MJ, et al. Diversity in clinical and biomedical research: A promise yet to be fulfilled. *PloS Med*. (2015) 12. doi: 10.1371/journal.pmed.1001918

4. Westerman S, Wenger N. Gender differences in atrial fibrillation: A review of epidemiology, management, and outcomes. *Curr Cardiol Rev*. (2018) 15:136–44. doi: 10.2174/1573403x15666181205110624

5. Yang AI, Mensah-Brown KG, Rinehart C, Fathy R, Hitti FL, Brant J, et al. Inequalities in meningioma survival: results from the national cancer database. *Cureus*. (2020) (3). doi: 10.7759/cureus.7304

6. Umeh OC, Currier JS. Sex differences in pharmacokinetics and toxicity of antiretroviral therapy. *Expert Opin Drug Metab Toxicol*. (2006) 2:273–83. doi: 10.1517/17425255.2.2.273

7. Becerra-Culqui TA, Liu Y, Nash R, Cromwell L, Dana Flanders W, Getahun D, et al. Mental health of transgender and gender nonconforming youth compared with their peers. *Pediatrics*. (2018) 141. doi: 10.1542/peds.2017-3845

8. Thoma BC, Salk RH, Choukas-Bradley S, Goldstein TR, Levine MD, Marshal MP. Suicidality disparities between transgender and cisgender adolescents. *Pediatrics*. (2019) 144. doi: 10.1542/peds.2019-1183

9. Toomey RB, Syvertsen AK, Shramko M. Transgender adolescent suicide behavior. *Int J Environ Res Public Health*. (2018) 142:20174218. doi: 10.1542/peds.2017-4218

10. Kim AM, Tingen CM, Woodruff TK. Sex bias in trials and treatment must end. *Nature*. (2010) 465:688–9. doi: 10.1038/465688a

11. National Institutes of Health. NIH Guideline on the Inclusion of Women and Minorities as Subjects in Clinical Research (2000). Available online at: https://grants.nih.gov/grants/funding/women_min/guidelines_update.htm:~:text=It%20is%20the%20policy%20of,satisfaction%20of%20the%20relevant%20Institute%2F (Accessed March 5, 2024).

12. Khan MS, Shahid I, Siddiqi TJ, Khan SU, Warraich HJ, Greene SJ, et al. Ten-year trends in enrollment of women and minorities in pivotal trials supporting recent us food and drug administration approval of novel cardiometabolic drugs. *J Am Heart Assoc*. (2020) 9. doi: 10.1161/JAHA.119.015594

13. Melloni C, Berger JS, Wang TY, Gunes F, Stebbins A, Pieper KS, et al. Representation of women in randomized clinical trials of cardiovascular disease prevention. *Circ Cardiovasc Qual Outcomes*. (2010) 3:135–42. doi: 10.1161/CIRCOUTCOMES.110.868307

14. Michos ED, Van Spall HGC. Increasing representation and diversity in cardiovascular clinical trial populations. *Nat Rev Cardiol*. (2021) 18:537–8. doi: 10.1038/s41569-021-00583-8

15. Taha B, Winston G, Tosi U, Hartley B, Hoffman C, Dahmane N, et al. Missing diversity in brain tumor trials. *Neurooncol Adv*. (2020) 2. doi: 10.1093/noajnl/vdaa059

16. Bøttern J, Stage TB, Dunvald ACD. Sex, racial, and ethnic diversity in clinical trials. *Clin Transl Sci*. (2023) 16:937–45. doi: 10.1111/cts.13513

17. Bodicoat DH, Routen AC, Willis A, Ekezie W, Gillies C, Lawson C, et al. Promoting inclusion in clinical trials—a rapid review of the literature and recommendations for action. *Trials*. (2021) 22. doi: 10.1186/s13063-021-05849-7

18. Treweek S, Banister K, Bower P, Cotton S, Devane D, Gardner HR, et al. Developing the INCLUDE Ethnicity Framework—a tool to help trialists design trials that better reflect the communities they serve. *Trials*. (2021) 22. doi: 10.1186/s13063-021-05276-8

19. Heidari S, Babor TF, De Castro P, Tort S, Curno M. Sex and Gender Equity in Research: rationale for the SAGER guidelines and recommended use. *Res Integr Peer Rev*. (2016) 1. doi: 10.1186/s41073-016-0007-6

20. American Psychological Association. Guidelines for psychological practice with transgender and gender nonconforming people. *Am Psychol*. (2015) 70:832–64. doi: 10.1037/a0039906

21. Hankivsky O, Springer KW, Hunting G. Beyond sex and gender difference in funding and reporting of health research. *Res Integr Peer Rev*. (2018) 3. doi: 10.1186/s41073-018-0050-6

22. Oertelt-Prigione S, Parol R, Krohn S, Preißner R, Regitz-Zagrosek V. Analysis of sex and gender-specific research reveals a common increase in publications and marked differences between disciplines. *BMC Med*. (2010) 8. doi: 10.1186/1741-7015-8-70

23. Gahagan J, Gray K, Whynacht A. Sex and gender matter in health research: Addressing health inequities in health research reporting. *Int J Equity Health*. (2015) 14. doi: 10.1186/s12939-015-0144-4

24. Hammarström A, Johansson K, Annandale E, Ahlgren C, Aléx L, Christianson M, et al. Central gender theoretical concepts in health research: the state of the art. *J Epidemiol Community Health (1978)*. (2014) 68:185–90. doi: 10.1136/jech-2013-202572

25. Johnson JL, Greaves L, Repta R. Better science with sex and gender: Facilitating the use of a sex and gender-based analysis in health research. *Int J Equity Health*. (2009) 8. doi: 10.1186/1475-9276-8-14

26. Krieger N. Genders, sexes, and health: What are the connections - And why does it matter? *Int J Epidemiol*. (2003) 32:652–7. doi: 10.1093/ije/dyg156

27. Wanta JW, Niforatos JD, Durbak E, Viguera A, Altinay M. Mental health diagnoses among transgender patients in the clinical setting: an all-payer electronic health record study. *Transgend Health*. (2019) 4:313–5. doi: 10.1089/trgh.2019.0029

28. Bockting WO, Miner MH, Swinburne Romine RE, Hamilton A, Coleman E. Stigma, mental health, and resilience in an online sample of the US transgender population. *Am J Public Health*. (2013) 103:943–51. doi: 10.2105/AJPH.2013.301241

29. Downing JM, Przedworski JM. Health of transgender adults in the U.S., 2014–2016. *Am J Prev Med*. (2018) 55:336–44. doi: 10.1016/j.amepre.2018.04.045

30. Brandt G, Prüll L, Paslakis G. Gesundheitliche Themen von LSBTIQ+Personen in der ärztlichen Ausbildung in Deutschland. *PPmP Psychotherapie Psychosomatik Medizinische Psychol*. (2022) (09/10):397–409. doi: 10.1055/a-1758-0366

31. Carlström R, Ek S, Gabrielsson S. [amp]]lsquo;Treat me with respect': transgender persons' experiences of encounters with healthcare staff. *Scand J Caring Sci*. (2021) 35:600–7. doi: 10.1111/scs.12876

32. Reisner SL, Biello K, Rosenberger JG, Austin SB, Haneuse S, Perez-Brumer A, et al. Using a two-step method to measure transgender identity in Latin America/the Caribbean, Portugal, and Spain. *Arch Sex Behav*. (2014) 43:1503–14. doi: 10.1007/s10508-014-0314-2

33. Lagos D, Compton D. Evaluating the use of a two-step gender identity measure in the 2018 general social survey. *Demography*. (2021) 58:763–72. doi: 10.1215/00703370-8976151

34. Lombardi E, Banik S. The utility of the two-step gender measure within Trans and Cis populations. *Sexuality Res Soc Policy*. (2016) 13:288–96. doi: 10.1007/s13178-016-0220-6

35. Tate CC, Ledbetter JN, Youssef CP. A two-question method for assessing gender categories in the social and medical sciences. *J Sex Res*. (2013) 50:767–76. doi: 10.1080/00224499.2012.690110

36. The GenIUSS Group. Best Practices for Asking Questions to Identify Tand Other Gender Minority Respondents on Population-Based Surveys. Los Angeles, CA: Williams Institute (2014). Available at: www.williaminstitute.law.ucla.edu (accessed June 13, 2024).

37. American Psychological Association. Guidelines for psychological practice with lesbian, gay, and bisexual clients. *Am Psychol*. (2012) 67:10–42. doi: 10.1037/a0024659

38. Conron KJ, Landers SJ, Reisner SL, Sell RL. Sex and gender in the US health surveillance system: a call to action. *Am J Public Health*. (2014) 104:970–6. doi: 10.2105/AJPH.2013.301831

39. Garbarski D. The measurement of gender expression in survey research. *Soc Sci Res*. (2023) 110. doi: 10.1016/j.ssresearch.2022.102845

40. Hart CG, Saperstein A, Magliozzi D, Westbrook L. Gender and health: beyond binary categorical measurement. *J Health Soc Behav*. (2019) 60:101–18. doi: 10.1177/0022146519825749

41. Roberts AL, Rosario M, Corliss HL, Koenen KC, Austin SB. Childhood gender nonconformity: a risk indicator for childhood abuse and posttraumatic stress in youth. *Pediatrics*. (2012) 129:410–7. doi: 10.1542/peds.2011-1804

42. Roberts AL, Rosario M, Slopen N, Calzo JP, Austin SB. Childhood gender nonconformity, bullying victimization, and depressive symptoms across adolescence and early adulthood: an 11-year longitudinal study. *J Am Acad Child Adolesc Psychiatry*. (2013) 52:143–52. doi: 10.1016/j.jaac.2012.11.006

43. Gordon AR, Austin SB, Schultz J, Guss CE, Calzo JP, Wang ML. Gender expression, peer victimization, and disordered weight-control behaviors among U.S. High school students. *J Adolesc Health*. (2021) 68:1148–54. doi: 10.1016/j.jadohealth.2020.08.032

44. Springer KW, Mouzon DM. Macho men" and preventive health care: implications for older men in different social classes. *J Health Soc Behav*. (2011) 52:212–27. doi: 10.1177/0022146510393972

45. Samulowitz A, Gremyr I, Eriksson E, Hensing G. Brave men" and "Emotional women": A theory-guided literature review on gender bias in health care and gendered norms towards patients with chronic pain. *Pain Res Manag*. (2018), 6358624. doi: 10.1155/2018/6358624

46. Bauer GR, Braimoh J, Scheim AI, Dharma C. Transgender-inclusive measures of sex/gender for population surveys: Mixedmethods evaluation and recommendations. *PloS One*. (2017) 12. doi: 10.1371/journal.pone.0178043

47. Stadler G, Chesaniuk M, Haering S, Roseman J, Straßburger VM, Martina S, et al. Diversified innovations in the health sciences: Proposal for a Diversity Minimal Item Set (DiMIS). *Sustain Chem Pharm*. (2023) 33. doi: 10.1016/j.scp.2023.101072

48. Halbeisen G, Brandt G, Paslakis G. A plea for diversity in eating disorders research. *Front Psychiatry*. (2022) 13:820043. doi: 10.3389/fpsyt.2022.820043

49. Paslakis G, Dimitropoulos G, Halbeisen G. Editorial: A global perspective on diversity in eating disorders. *Front Psychiatry*. (2023) 14:1276078. doi: 10.3389/fpsyt.2023.1276078

50. Ho F, Mussap AJ. The Gender Identity Scale: Adapting the Gender Unicorn to measure gender identity. *Psychol Sex Orientat Gend Divers*. (2019) 6:217–31. doi: 10.1037/sgd0000322

51. Doubblestein D, Koehler L, Anderson E, Scheiman N, Stewart P, Schaverien M, et al. Development of a core outcome set for breast cancer-related lymphedema: a Delphi study. *Breast Cancer Res Treat*. (2024) (2):359–70. doi: 10.1007/s10549-024-07262-5

52. Mariño RJ, Uribe SE, Chen R, Schwendicke F, Giraudeau N, Scheerman JFM. Terminology of e-Oral Health: Consensus Report of the IADR's e-Oral Health Network Terminology Task Force. *BMC Oral Health*. (2024) 24:280. doi: 10.1186/s12903-024-03929-z

53. Tsai H-Y, Lee S-YD, Coleman C, Sørensen K, Tsai T-I. Health literacy competency requirements for health professionals: a Delphi consensus study in Taiwan. *BMC Med Educ*. (2024) 24:209. doi: 10.1186/s12909-024-05198-4

54. Wylie SA, Corliss HL, Boulanger V, Prokop LA, Austin SB. Socially assigned gender nonconformity: A brief measure for use in surveillance and investigation of health disparities. *Sex Roles*. (2010) 63:264–76. doi: 10.1007/s11199-010-9798-y

55. Laskowski NM, Brandt G, Paslakis G. Gender inequalities of the COVID-19 pandemic: A synthesis of systematic reviews with a focus on sexual and gender minorities (German). *PPmP - Psychotherapie Psychosomatik Medizinische Psychol*. (2024) 74:57–69. doi: 10.1055/a-2228-6244

56. Laskowski NM, Brandt G, Reque CB, Sabel L, Pahlenkemper M, Zaiser C, et al. The collateral effects of the COVID-19 pandemic: A gender-specific systematic review of disordered eating behaviour in the general population. *Eur Eating Disord Rev*. (2024). doi: 10.1002/erv.3141

57. Kairuz CA, Casanelia LM, Bennett-Brook K, Coombes J, Yadav UN. Impact of racism and discrimination on physical and mental health among Aboriginal and Torres Strait islander peoples living in Australia: a systematic scoping review. *BMC Public Health*. (2021) 21. doi: 10.1186/s12889-021-11363-x

58. Cave L, Cooper MN, Zubrick SR, Shepherd CCJ. Racial discrimination and child and adolescent health in longitudinal studies: A systematic review. *Soc Sci Med*. (2020) 250. doi: 10.1016/j.socscimed.2020.112864

59. NHS England and LGBT Foundation. If we're nit Counted, we don't count - Good practice guide to monitoring sexual orientation and trans status 2021. Manchester, UK: LGBT foundation (2021). Available at: www.stonewall.org.uk/help-advice/faqs-and-glossary/glossary-terms (accessed June 13, 2024).

60. Farrell M, Alseidi A, Byerly S, Fockens P, Giberson FA, Glaser J, et al. A core outcome set for acute necrotizing pancreatitis: an eastern association for the surgery of trauma modified Delphi method consensus study. *J Trauma Acute Care Surg*. (2024) (6):965–70. doi: 10.1097/TA.0000000000004281

frontiers | Frontiers in Psychiatry

TYPE Original Research
PUBLISHED 02 May 2025
DOI 10.3389/fpsyt.2025.1426998

OPEN ACCESS

EDITED BY
Edmund Howe,
Uniformed Services University of the Health Sciences, United States

REVIEWED BY
Joe Wherton,
University of Oxford, United Kingdom
Srinagesh Mannekote Thippaiah,
Creighton University Health Sciences Phoenix Campus, United States

*CORRESPONDENCE
Omar A. Alshaikhi
alshaikhi.14191@hotmail.com
Mahmoud Essam Elrggal
merggal@uqu.edu.sa

RECEIVED 02 May 2024
ACCEPTED 01 April 2025
PUBLISHED 02 May 2025

CITATION
Alshaikhi OA, Aldarsi LA, Basfar IAA, Alshehri A, Shuqdar RM, Ghazy RM and Elrggal ME (2025) Assessment of awareness, practices, perceptions, and satisfaction of telepsychiatry among mental healthcare providers in Saudi Arabia.
Front. Psychiatry 16:1426998.
doi: 10.3389/fpsyt.2025.1426998

Assessment of awareness, practices, perceptions, and satisfaction of telepsychiatry among mental healthcare providers in Saudi Arabia

Omar A. Alshaikhi[1*], Lujain A. Aldarsi[2], Ibrahim Abdullah A. Basfar[3], Alwaleed Alshehri[4], Raafat M. Shuqdar[5], Ramy Mohamed Ghazy[6,7] and Mahmoud Essam Elrggal[8*]

[1]King Abdulaziz Hospital & Oncology Center, Ministry of Health, Jeddah, Saudi Arabia, [2]Alamal Mental Health Hospital, Ministry of Health, Medinah, Saudi Arabia, [3]Eradah and Mental Health Complex, Jeddah, Saudi Arabia, [4]Abha Mental Health Hospital, Ministry of Health, Abha, Saudi Arabia, [5]College of Medicine, Taibah University, Madina, Saudi Arabia, [6]Tropical Health Department, High Institute of Public Health, Alexandria University, Alexandria, Egypt, [7]Family and Community Medicine Department, College of Medicine, King Khalid University, Abha, Saudi Arabia, [8]Department of Pharmacology and Toxicology, Umm al-Qura University, Mecca, Saudi Arabia

Background: Telepsychiatry, a global method for mental health services, has gained global attention, especially in the corona-virus diseases 2019 (COVID-19) era. It uses electronic communication and information technologies for remote psychiatric care, with synchronous modalities involving real-time interactions and asynchronous modalities allowing indirect communication. This study aimed to assess the awareness, practices, perceptions, and satisfaction of mental healthcare providers (MHPs) in the Kingdom of Saudi Arabia (KSA) regarding telepsychiatry utilization.

Method: This online, survey-based cross-sectional study included MHPs, both physicians and non-physicians, working in public and private mental health services across various regions of KSA. The study questionnaire was distributed using Google Forms via email and other popular social media platforms (including WhatsApp, Twitter, Telegram, and Facebook). The questionnaire was developed to assess the personal and socio-demographic characteristics of the participants, as well as their awareness, practices, perceptions, and satisfaction regarding telepsychiatry. Participants were recruited using convenience and snowball sampling techniques.

Results: Out of the 500 MHPs enrolled in the study, 52.2% were under 30 years, 52.6% were male, and 54.8% were single. Participants were from five regions: Central (27.6%), Western (22.6%), Eastern (22.0%), Southern (16.8%), and Northern (11.0%). Professionally, 33.8% were psychiatric residents, 21.8% were psychologists, 19.2% were social workers, and 12.6% each were psychiatric consultants and specialists. Of the study participants, 73.8% demonstrated awareness of telepsychiatry. More than three-fifths (63.7%) had previous practical experience. Among those with experience, 82.9% reported telepsychiatry practice durations of 3 years or less. Perception and satisfaction percentage scores for different domains

10.3389/fpsyt.2025.1426998

indicated high perception regarding the advantages and disadvantages (62.6% ± 13.9) and improved patient access (75.2% ± 17.4). However, lower satisfaction scores were observed for MHPs' access satisfaction (46.6% ± 11.7) and practice satisfaction (57.6% ± 9.6).

Conclusion and recommendation: MHPs in KSA exhibit high awareness but engage in telepsychiatry practice to a lesser extent. They have a good perception and are satisfied with their telepsychiatry practice. The study recommends that policymakers and stakeholders in KSA should prioritize building the capacities of MHPs in telehealth. Expanding and scaling up awareness activities are essential to improve digital literacy and telehealth practices among MHPs

KEYWORDS

telemedicine, telepsychiatry, tele-mental health, psychiatric service, mental healthcare providers

Inroduction

According to the Global Burden of Disease Study 2019 (GBD 2019), it has been estimated that mental health diseases affect approximately 555.44 million patients, ranking as the eighth contributor to disability burden in Asia in 2019 (5). The Saudi National Mental Health Survey (SNMHS) reported that the twelve-month prevalence of mental disorders is estimated to be 20.2% in the Kingdom of Saudi Arabia (KSA), which is considered relatively high compared to other high-income countries (6). It has been estimated that two out of five Saudi young adults meet the diagnostic criteria for a mental health disorder during their lifetime (7). Specifically, a high prevalence of stress, depression, and anxiety has been reported among university students (8), yet only 5% of those affected seek mental health consultation (7).

Despite the substantial burden of mental health diseases, many considerable barriers were demonstrated to prevent patients from seeking mental health consultation (9). These include the lack of knowledge and negative attitude about mental health consultations among patients, lack of perceived need, mental stigma and confidentiality concerns (7, 10, 11). Additional barriers encompassed cultural and religious beliefs, financial barriers, transportation difficulties and the limited availability and access to psychiatric health services (11, 12). Eventually, delayed management of these health problems is associated with detrimental effects not only on the patient's quality of life and educational achievement but also on the overall societal health and economic status (13). To enhance access to mental healthcare and reduce the treatment gap, these obstacles should be recognized and addressed (14).

Technological advances in healthcare have expanded the range of options available for diagnosing, treating, and monitoring patients who seek remote care (15). The integration of information systems and technological advances led to the renaissance of healthcare delivery (16). Telemedicine generally refers to the use of technology and telecommunication to assist in medical practice. It has a wide range of uses, including online patient consultations, remote control, telehealth nursing, and remote physical and psychiatric rehabilitation (17). According to the World Health Organization, telemedicine is defined as a means of improving the health of individuals and communities, preventing diseases and accidents, and providing healthcare services by using remote, valid information communication methods. This, together with the continuous training of healthcare staff on the use of information and communication technologies (ICT) (18). On the other hand, some challenges and limitations exist hindering the widespread use of telehealth services, such as reimbursement issues, lack of direct eye contact with patients, the necessity of security software development for patient information protection and stable access to video conferencing (19).

The increased demand for mental healthcare services during and after the coronavirus disease 2019 (COVID-19) pandemic paved the way for significantly increased adoption of digital health and telepsychiatry (20, 21). Telepsychiatry health is demonstrated as the remote sharing of patient information via electronic communication systems such as video conferencing, landlines and mobile phone lines, computer-based internet tools, home-based telehealth phones and additional devices, focusing on the psychiatric aspects to improve the mental health of patients (22, 23). Telepsychiatry refers to the use of electronic communication and information technologies to deliver or support psychiatric care remotely. It can be categorized into synchronous and asynchronous modalities. Synchronous telepsychiatry involves real-time interactions between the patient and clinician, such as video consultations. In contrast, asynchronous telepsychiatry allows for indirect or time-delayed communication, where information is shared and reviewed at different times (1). This adoption is a safe and accepted option for both mental healthcare providers (MHPs)

and patients, where MHPs can safely deliver their services through digital platforms and allow patients to receive the care needed while at home (4, 24, 25). The telepsychiatry approach overall improved the quality and availability of care (19).

The expansion of telepsychiatry reflects the progress that has been made in the health field, improving access and quality of care (19). It offers several benefits for both patients and providers. It saves time and effort for clinicians and healthcare providers. Moreover, it improves patients' access to care, especially for those living in remote areas, alleviates the feeling of stigma for patients seeking mental healthcare, and improves patients' compliance with treatment and continuity of care (19, 20, 24). Additionally, it allows better healthcare-related choices, increases the quality and performance of emergency services, and reduces the time to reach final diagnoses. Finally, it improves the efficiency of healthcare-related services due to cost reduction for both providers and patients by optimizing clinical procedures and minimizing expenses for transport to hospitals and clinics (17, 26).

Various advancements in telemedicine have evolved in KSA. The Ministry of Health (MOH) has adopted a new strategy to maximize the effectiveness of healthcare services and to enhance patient healthcare accessibility regardless of their geographic location (27). Numerous telehealth applications have been introduced, such as Seha, Tawakkalna, Mawid, Tabaud, and Tataman, between 2018 and 2020, to improve the provision of healthcare services in KSA (28). However, cultural and religious factors pose significant challenges to the implementation of telepsychiatry, as many psychiatrists remain skeptical about its outcomes, and clinicians express dissatisfaction with the service, reducing their willingness to adopt telemedicine (2). Additional obstacles include a shortage of qualified experts to implement the technology, deficiencies in essential ICT infrastructure, and the absence of effective strategies and plans for telemedicine implementation. Furthermore, some healthcare providers lack ICT skills, limiting their ability to adopt this innovation (2, 3).

To achieve and establish an effective telepsychiatry service, MHPs must have a good amount of knowledge and positive attitudes toward its use and must be skilled in using ICT (29). The reported benefits of telepsychiatry practice have motivated researchers to conduct studies aiming at improving telepsychiatry practice and understanding perceptions and barriers among MHPs and patients to expand and scale up the service and improve the chance to officially integrate it into public and private mental health services. This study aimed to assess the awareness of telepsychiatry among MHPs in the KSA as well as their perceptions and satisfaction with telepsychiatry service.

Subjects and methods

Study design and setting

This descriptive cross-sectional study was conducted to assess the awareness, practices, perceptions, and satisfaction regarding telepsychiatry among MHPs in the KSA.

Sample size and study population

We assumed that 5% of MHPs are aware of telepsychiatry, requiring a minimum sample of 199 to achieve 80% statistical power to detect a small-to-moderate effect size (g = 0.1) at a 0.05 significance level. To ensure an adequate sample for assessing user satisfaction, we increased this by 2.5. For evaluating satisfaction with telepsychiatry, the required sample size, as determined by G*Power, was 166 participants. This calculation maintains 80% power to detect a small-to-moderate effect size (g = 0.1) at a 0.05 significance level, assuming a constant proportion of 0.66 of healthcare providers accepting tele-mental health services (4). Inclusion and exclusion criteria: The study included licensed MHPs (physicians, psychologists, and social workers) actively delivering psychiatric health services in public and private hospitals and centers across various regions of KSA. KSA is administratively divided into five primary regions, each encompassing multiple provinces. Central Region (Al-Riyadh), Western Region (Al-Madinah, Makkah, and Tabuk), Eastern Region (Al-Sharqiyah), Southern Region (Al-Jazan, Asir, and Najran), Northern Region (Al-Hudud Al-Shamaliyah, Al-Jawf, and Tabuk). Participants were recruited from diverse geographic regions and practice settings to ensure a broad representation of perspectives. Experience, perception, perceived access, and satisfaction were assessed only for those who were practicing telepsychiatry. Incomplete or inadequately filled survey responses were excluded to maintain data quality. Participation was voluntary, and informed consent was obtained from all respondents.

Data collection instrument

The survey instrument comprised three sections of closed-ended questions:

1. Socio-demographic information: Items included age, gender, marital status, work region, profession, workplace, and years of experience.
2. Awareness and experience of telepsychiatry: This section queried participants on their prior knowledge about telepsychiatry.
3. Practice of telepsychiatry: Platform used, duration of telepsychiatry practice, total number of treated patients, number of patients treated in the past year, number of sessions/months, self-education of telepsychiatry, received professional training in telepsychiatry, participated in research related to telepsychiatry.
4. Perceptions and satisfaction with telepsychiatry: This section contained 30 statements divided into four specific domains:

a. Perceived advantages and disadvantages of telepsychiatry (6 statements).
b. Perceived patient access to telepsychiatry services (3 statements).

c. Perceived MHP's access to telepsychiatry services (6 statements).
d. Overall satisfaction with telepsychiatry practice (15 statements).

Responses were recorded on a 5-point Likert scale (0 = strongly disagree, 1 = disagree, 2 = neither agree nor disagree, 3 = agree, 4 = strongly agree), with reversed scoring applied to negatively phrased statements. Reversed statements are marked in Table 1. For analysis, we collapsed responses as follows: 0 and 1 (disagree) and 3 and 4 (agree). The questionnaire was developed based on a comprehensive review of the existing literature on telepsychiatry and was refined following expert consultations with 2 consultant psychiatrists to ensure clarity, relevance, and content validity. The content and face validity of the tool were assessed by a group of consultant psychiatrists. They also examined the tool for clarity, significance, comprehensiveness, wording, and understanding. Their suggestions and recommendations were taken into consideration.

Pilot testing

A pilot test was conducted on 30 MHPs (comprising 10 psychiatrists, 10 social workers, and 10 psychologists) to evaluate the clarity of the items and to estimate the time required for completion. Feedback from this pilot test was used to make the final revised survey. Those who participated in the pilot test were excluded from the main study sample.

Survey distribution

Data was collected through an online questionnaire that was distributed using Google Forms via e-mails and other popular social media platforms (including WhatsApp, Twitter, Telegram, and Facebook) that are commonly used by MHPs in KSA between August 1st, 2023, to August 31st, 2023. The survey was sent again and reposted every week by e-mail or on social media platforms. Only one response was allowed from each participant. These distribution methods were selected for their wide reach and cost-effectiveness, enabling rapid data collection.

Ethical considerations

The study was approved by the Research Ethics Committee at Umm Al-Qura University (approval no: UMZX060622). The importance and purpose of the study, as well as the potential risks and benefits of participation, were clearly explained to prospective participants before their consent was obtained. Only consenting MHPs were asked to participate and fill out the questionnaires. The anonymity, confidentiality, and privacy of the participating MHPs were assured; they were informed about the possibility of withdrawing voluntarily at any time without any consequences.

Statistical analysis

Statistical analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 24.0. Categorical variables were summarized using frequencies and percentages. Data normality was assessed through histogram visualization and the Kolmogorov-Smirnov test. For quantitative variables, mean and standard deviation (SD) were used to describe normally distributed data, whereas median and interquartile range (IQR) were applied for skewed distributions. The reliability of the study instruments was assessed using Cronbach's alpha, where a value of ≥ 0.70 was considered acceptable, indicating good internal consistency. For bivariate analysis, Pearson's chi-squared test was employed to assess associations between qualitative variables. To compare mean differences between two groups, an independent t-test was used for normally distributed data, whereas the Mann-Whitney U test was applied for non-normally distributed data. A p-value < 0.05 was considered statistically significant across all tests.

Results

Participants' characteristics

The questionnaire was distributed to 638 MHPs, of whom 500 fully completed the survey with no missing data (response rate = 78.3%). The study sample included 52.2% of participants under 30 years old, 52.6% were male, and 54.8% were single. Participants were distributed across five regions: Central (27.6%), Western (22.6%), Eastern (22.0%), Southern (16.8%), and Northern (11.0%). Professionally, 33.8% were psychiatric residents, 21.8% were psychologists, 19.2% were social workers, and 12.6% each were psychiatric consultants and specialists. Physicians accounted for 59.0%, while non-physicians made up 41.0%. Most worked in public settings (65.0%), followed by private (15.4%) and both sectors (19.6%). Experience levels ranged from 0–2 years (35.6%) to 11+ years (18.6%), with a median (IQR) of 4.0 (2.0 – 8.75) years Table 1.

Of the 500 surveyed MHPs, 369 (73.8%) were aware of telepsychiatry and 235 (63.7%) of them already practised telepsychiatry Figure 1.

Age was not significantly associated with prior awareness of telepsychiatry. However, the highest proportion of MHPs who were unaware of telepsychiatry was among those under 30 years old (78; 29.9%). Gender also showed no significant association, with a slightly higher percentage of females lacking awareness (67; 28.3%) compared to males (64; 24.3%). Marital status revealed a non-significant trend ($p = 0.060$), with single MHPs (81; 29.6%) more likely to lack awareness than married participants (50; 22.1%). Work region, however, showed a significant association ($p < 0.001$), with the highest absence of awareness in the Northern Region (22; 40.0%). Although awareness was lower among those working in the private sector (22; 28.6%), neither workplace nor profession showed a significant association. Notably, years of experience were significantly linked to awareness ($p = 0.030$), with the highest lack

TABLE 1 Sociodemographic and professional characteristics of study participants (n = 500).

Characteristic (n = 500)	Level	Total sample n (%)
Age	< 30 years	261 (52.2)
	30-39 years	147 (29.4)
	> 40 years	92 (18.4)
Gender	Male	263 (52.6)
	Female	237 (47.4)
Marital Status	Single	274 (54.8)
	Married	226 (45.2)
Work region	Central Region	138 (27.6)
	Western Region	113 (22.6)
	Eastern Region	110 (22.0)
	Southern Region	84 (16.8)
	Northern Region	55 (11.0)
Profession	Psychiatric consultant	63 (12.6)
	Psychiatric specialist	63 (12.6)
	Psychiatric resident	169 (33.8)
	Psychologist	109 (21.8)
	Social worker	96 (19.2)
Physicians	Physician	295 (59.0)
	Non-physician	205 (41.0)
Place of work	Public	325 (65.0)
	Private	77 (15.4)
	Both	98 (19.6)
Years of experience in psychiatry	0-2 years	178 (35.6)
	3-5 years	155 (31.0)
	6-10 years	74 (14.8)
	11+ years	93 (18.6)
	Median (IQR)	4.0 (2.0 – 8.75)

of awareness among MHPs with 0–2 years of experience (60; 33.7%). Participants who were unaware of telepsychiatry were excluded from further analysis, leaving 369 MHPs for subsequent assessments Table 2.

Reliability of the Survey

Cronbach's alpha test results showed that survey items were found to have a good level of reliability. The Cronbach alpha values were as follows: perceived as advantages and disadvantages (0.66), perceived access for patients/customers (0.58), MHPs access (0.66), MHPs satisfaction with telepsychiatry experience (0.89).

Factors associated with the telepsychiatry practice of MHPs

Correlates of telepsychiatry practice are illustrated in Table 3. Telepsychiatry practice was significantly lower among younger MHPs (103; 56.3%) than older ones aged 30-39 years (87; 75.7%) and MHPs aged more than 40 years (45; 63.4%), p = 0.003. The gender and profession of the MHPs were not significantly associated with their telepsychiatry practice. Married MHPs practised a significantly greater amount of telepsychiatry (127; 72.2%) than single MHPs (108; 56%), p = 0.001. The practice of telepsychiatry was highest in the Central Region (88; 73.9%), p = 0.0016. MHPs working in the public sector were shown to be the least in telepsychiatry practice (138; 58%) compared to those working in the private sector (40; 72.7%) or in both sectors (57;75%), p = 0.009. MHPs with shorter duration of work experience (0-2 years) had the lowest in telepsychiatry practice (59; 50%), p = 0.003. The further analysis excluded the 134 MHPs who had no previous experience practising telepsychiatry. Only the 235 MHPs who had previously practised telepsychiatry were included in the following analysis.

Experience of telepsychiatry practice among MHPs

The type of platform used, duration of telepsychiatry practice, and previous self-education of telepsychiatry were not found to be significantly associated with the profession of the MHP. Concerning expertise in telepsychiatry, in general, physicians had treated more patients via telepsychiatry than non-physicians, where 42.8% (62) of physicians had significantly treated more than 21 patients (62; 42.8%), while 37.8% (34) of non-physicians treated fewer than 6 patients through telepsychiatry sessions. During the past year, 41 (28.3%) physicians treated more than 20 patients remotely compared to only 15 (16.7%) non-physicians who had a similar experience. About the number of telepsychiatry sessions per month, physicians conducted a higher number of sessions per month than non-physicians. Surprisingly, non-physicians received significantly more professional training in telepsychiatry than physicians (57; 63.3% vs. 72; 49.7%). Conversely, physicians participated more in telepsychiatry-related research than non-physicians (72; 49.7% vs. 57; 63.3%) Table 4.

Perceptions, perceived access, and satisfaction of MHPs with telepsychiatry

As for perceived advantages and disadvantages, they mostly agreed that telepsychiatry saved patients' time and reduced the costs associated with the mental health service. Concerning access to

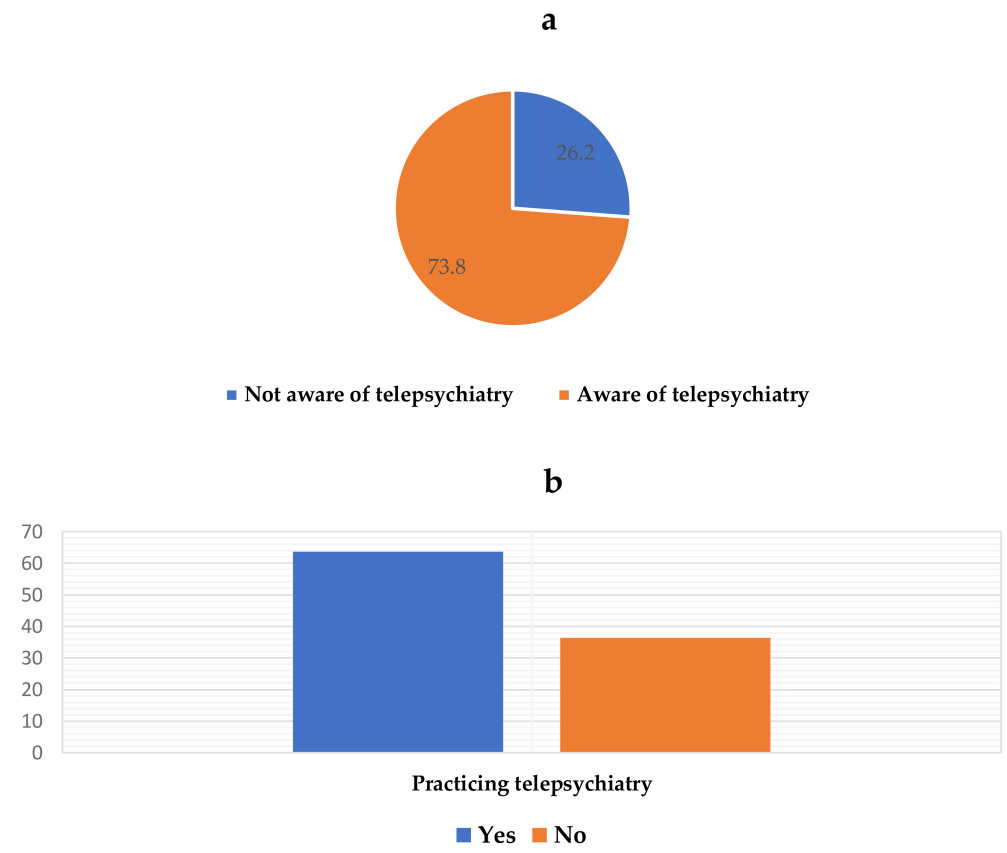


FIGURE 1
Participants' prior awareness **(a)** and prior practice of telepsychiatry **(b)**.

telepsychiatry, perceived patient access was the best-perceived domain, with a mean score of 75.2 ± 17.4. Whereas, concerning providers' access, this domain showed the least level of agreement (46.6 ± 11.7). However, they mostly agreed that the system used is accessible and easy to use. Satisfaction with the MHPs' experience of telepsychiatry was moderate (57.6 ± 9.6). They mostly agreed that there is a need for training; they will continue to use it, and they would recommend it to other colleagues Table 5.

Discussion

Telepsychiatry is a contemporary method of delivering mental health services that is gaining global attention, especially in the post-COVID-19 era (24). The purpose of this study was to assess Saudi MHPs' awareness and practices of telepsychiatry and their correlates. Additionally, their perceptions and satisfaction with the use of telepsychiatry were also assessed. Telepsychiatry is an increasingly recognized method for delivering mental health services, particularly in the post-COVID-19 era, where its adoption has accelerated globally. Our findings revealed that the majority of MHPs (73.8%) demonstrated awareness of telepsychiatry, with 63.7% of those aware having practical experience in its use. However, the extent of telepsychiatry practice varied significantly across demographic and professional groups, with younger MHPs, those in the Northern Region, and professionals with fewer years of experience being less likely to engage in telepsychiatry. Perceptions of telepsychiatry were generally positive, as MHPs appreciated its ability to save time, reduce costs, and improve patient access to care, with mean percentage scores indicating high agreement in these domains (62.6% for perceived advantages and disadvantages, and 75.2% for perceived patient access). Despite these favorable perceptions, satisfaction with their telepsychiatry practice was moderate (57.6%), with notable concerns about technical difficulties, communication barriers, and ethical issues

Awareness and practice of telepsychiatry

Our findings showed that most MHPs (73.8%) were aware of telepsychiatry, and nearly half of them (63.7%) had already practiced telepsychiatry with their patients. Awareness and practice rates of telepsychiatry didn't differ among physicians and non-physicians. In contrast, low levels of knowledge regarding telemedicine technology and telepsychiatry were previously reported in KSA (30, 31) and Poland (32). This may be attributed to limited workshops, seminars, conferences and training that discuss and introduce telemedicine as a vital tool to improve health care services and quality. However, as it is an evolving topic, telehealth knowledge is expected to increase every day.

TABLE 2 Characteristics of MHPs and their association with awareness of telepsychiatry.

Characteristic (n = 500)	Level	Unaware of telepsychiatry n (%) 131 (26.2)	Aware of telepsychiatry n (%) 369 (73.8)	p-value
Age	< 30 years	78 (29.9)	183 (70.1)	$p = 0.145$
	30-39 years	32 (21.8)	115 (78.2)	
	> 40 years	21 (22.8)	71 (77.2)	
Gender	Male	64 (24.3)	199 (75.7)	$p = 0.318$
	Female	67 (28.3)	170 (71.7)	
Marital Status	Single	81 (29.6)	193 (70.4)	$p = 0.060$
	Married	50 (22.1)	176 (77.9)	
Work region	Central region	19 (13.8)	119 (86.2)	$p < 0.001$*
	Western region	38 (33.6)	75 (66.4)	
	Eastern region	37 (33.6)	73 (66.4)	
	Southern region	15 (17.9)	69 (82.1)	
	Northern region	22 (40.0)	33 (60.0)	
Profession	Psychiatric consultant	15 (23.8)	48 (76.2)	$p = 0.781$
	Psychiatric specialist	15 (23.8)	48 (76.2)	
	Psychiatric resident	44 (26.0)	125 (74.0)	
	Psychologist	27 (24.8)	82 (75.2)	
	Social worker	30 (31.3)	66 (68.8)	
Physicians	Physician	74 (25.1)	221 (74.9)	$p = 0.462$
	Non-physician	57 (53.8)	148(72.2)	
Place of work	Public	87 (26.8)	238 (73.2)	$p = 0.609$
	Private	22 (28.6)	55 (71.4)	
	Both	22 (22.4)	76 (77.6)	
Years of experience in psychiatry	0-2 years	60 (33.7)	118 (66.3)	$p = 0.030$ *
	3-5 years	31 (20.0)	124 (80.0)	
	6-10 years	19 (25.7)	55 (74.3)	
	11+ years	21 (22.6)	72 (77.4)	
	Median (IQR)	3.0 (1.5- 8.0)	4.0 (2.0 – 9.0)	$p = 0.031^c$

Chi-squared test, b) Independent sample t-test, c) Mann-Whitney Test. Significance ($p < 0.05$) is denoted with *.

The awareness of telepsychiatry in our study was higher among older MHPs with longer years of experience. This was in line with the findings of a similar study conducted in KSA (30) that highlighted clinicians' age and years of experience, which significantly correlated with telepsychiatry awareness and knowledge. This finding could be explained by the fact that longer practice years are usually associated with deeper levels of studying, continuous medical training and checking ongoing research updates in the field of interest. Moreover, our study findings highlighted the existence of a significant difference among different regions of Saudi Arabia regarding the awareness and familiarity with telepsychiatry, as 40% of MHPs from the Northern Region reported being unaware of telepsychiatry. This finding may be indicative of maldistribution of clinical resources and personnel and uneven internet access between regions and between urban/rural areas in KSA (33). Sharing expertise, continuous medical educational programs and data records among different geographical regions would be the ideal approach to overcome the self-limiting national geographic barrier and guarantee full services for different regions of KSA. There were no other significant correlations between awareness of telepsychiatry and sociodemographic factors, including gender, marital status and working sector, similar to the findings reported by a Saudi Arabian study conducted by Khalil et al. (34).

Perceptions of telepsychiatry

Interestingly, the studied MHPs from KSA mostly showed positive perceptions regarding telepsychiatry practice. They

10.3389/fpsyt.2025.1426998

TABLE 3 MHPs' correlates of previous experience of telepsychiatry for treating their patients (n = 369).

Characteristic (N = 369)	Level	Not practicing telepsychiatry n (%) 134 (36.3)	Practicing telepsychiatry. n (%) 235 (63.7)	p value
Age	< 30 years	80 (43.7)	103 (56.3)	$p = 0.003$*
	30-39 years	28 (24.3)	87 (75.7)	
	> 40 years	26 (36.6)	45 (63.4)	
Gender	Male	70 (35.2)	129 (64.8)	$p = 0.623$
	Female	64 (37.6)	106 (62.4)	
Marital status	Single	85 (44.0)	108 (56.0)	$p = 0.001$*
	Married	49 (27.8)	127 (72.2)	
Work region	Central Region	31 (26.1)	88 (73.9)	$p = 0.016$*
	Western Region	36 (48.0)	39 (52.0)	
	Eastern Region	32 (43.8)	41 (56.2)	
	Southern Region	25 (36.2)	44 (63.8)	
	Northern region	10 (30.3)	23 (69.7)	
Profession	Psychiatric consultant	13 (27.1)	35 (72.9)	$p = 0.254$
	Psychiatric specialist	13 (27.1)	35 (72.9)	
	Psychiatric resident	50 (40.0)	75 (60.0)	
	Psychologist	30 (36.6)	52 (63.4)	
	Social worker	28 (42.4)	38 (57.6)	
Physicians	Physician	77 (34.7)	145 (65.3)	$p = 0.424$
	Non-physician	57 (38.8)	90 (61.2)	
Place of work	Public	100 (42.0)	138 (58.0)	$p = 0.009$*
	Private	15 (27.3)	40 (72.7)	
	Both	19 (25.0)	57 (75.0)	
Years of experience in psychiatry	0-2 years	59 (50.0)	59 (50.0)	$p = 0.003$ *
	3-5 years	37 (29.8)	87 (70.2)	
	6-10 years	16 (29.1)	39 (70.9)	
	11+ years	22 (30.6)	50 (69.4)	

Significance ($p < 0.05$) denoted with *.

TABLE 4 Telepsychiatry practice of physician and non-physician MHPs (n =235).

Characteristic (N = 235)	Level	Total n (%)	Physicians n (%) 145 (61.5)	Non-Physicians n (%) 90 (38.3)	p value
Platform used	A (Ayadi)	18 (7.7)	9 (6.3)	9 (10.0)	$p = 0.179$
	L (Labayh)	51 (21.8)	31 (21.5)	20 (22.2)	
	M (Mind)	38 (16.2)	19 (13.2)	19 (21.1)	
	O (Own website)	68 (29.1)	48 (33.3)	20 (22.2)	
	Q (Qarebon)	20 (8.5)	10 (6.9)	10 (11.1)	
	Other	39 (16.7)	27 (18.8)	12 (13.3)	

(Continued)

TABLE 4 Continued

Characteristic (N = 235)	Level	Total n (%)	Physicians n (%) 145 (61.5)	Non-Physicians n (%) 90 (38.3)	p value
Duration of telepsychiatry practice	< one year	92 (39.1)	57 (39.3)	35 (38.9)	$p = 0.867$
	1-3 years	103 (43.8)	62 (42.8)	41 (45.6)	
	> three years	40 (17.0)	26 (17.9)	14 (15.5)	
Total number of treated patients	< 6	67 (28.5)	33 (22.8)	34 (37.8)	$p = 0.001$*
	6-10	45 (19.1)	26 (17.9)	19 (21.1)	
	11-16	25 (10.6)	11 (7.6)	14 (15.6)	
	17-21	21 (8.9)	13 (9.0)	8 (8.9)	
	> 21	77 (32.8)	62 (42.8)	15 (16.7)	
Number of patients treated in the past year	< 6	85 (36.2)	42 (29.0)	43 (47.8)	$p = 0.003$*
	6-10	51 (21.7)	29 (20.0)	22 (24.4)	
	11-20	47 (20.0)	33 (22.8)	14 (15.6)	
	> 20	52 (22.1)	41 (28.3)	11 (12.2)	
Number of sessions/months	< 3	88 (37.4)	52 (35.9)	36 (40.0)	$p = 0.042$*
	3-5	66 (28.1)	33 (22.8)	33 (36.7)	
	6-10	40 (17.0)	28 (19.3)	12 (13.3)	
	11-20	23 (9.8)	18 (12.4)	5 (5.6)	
	> 20	18 (7.7)	14 (9.7)	4 (4.4)	
Self-education of telepsychiatry	Yes	189 (80.4)	115 (79.3)	74 (82.2)	$p = 0.584$
	No	46 (19.6)	30 (20.7)	16 (17.8)	
Received professional training in telepsychiatry	Yes	129 (54.9)	72 (49.7)	57 (63.3)	$p = 0.041$*
	No	106 (45.1)	73 (50.3)	33 (36.7)	
Participated in research related to telepsychiatry	Yes	108 (46.0)	59 (40.7)	49 (54.4)	$p = 0.040$*
	No	127 (54.0)	86 (59.3)	41 (45.6)	

Significance ($p < 0.05$) is denoted with *.

mostly appreciated this method as one for saving time and money, and were least enthusiastic about its suitability for all stages of mental health problems. Similar views and perceptions regarding saving time, effort, and money were revealed in the results of similar studies conducted in KSA (30, 31). Favorable attitudes towards telepsychiatry among MHPs vary across different studies conducted in different countries. It was high among Saudi (31), Spanish (35, 36), and Indian MHPs (37). However, it was lower among Ethiopian MHPs (29). Several factors could stand behind such differences. First, using different assessment tools and the questions that were used to assess attitudes or perceptions. Second, the characteristics and expertise of the sampled MHPs, in addition to their digital literacy. The COVID-19 lockdown greatly impacted providers' perception and practice of telemedicine (24). Hence, the timing of when the studies were conducted could yield different results depending on whether the study was carried out before, during, or after the COVID-19 era.

In our study, MHPs showed a high perception of telepsychiatry in terms of improving patients' access to care. Such a high perception regarding improved access to healthcare using telehealth was reported in previous studies conducted in KSA (31) and India (38). The results documented that most health providers expressed that telehealth enhances patients' direct access to healthcare, especially in cases of emergencies and chronic physical or mental illnesses.

Satisfaction with telepsychiatry practice

Furthermore, our study revealed that satisfaction with telepsychiatry practice experience was lower in general than the perception of its advantages and improved access for patients. This could be interpreted considering their lower perception regarding their perceived satisfaction with telepsychiatry access and perceived technical difficulties. This is also evident in their highly perceived need for telepsychiatry training and expertise. These findings align with the findings of a similar study that demonstrated a significant association between a favorable attitude towards telepsychiatry and providers' expertise in using health technology (29).

10.3389/fpsyt.2025.1426998

TABLE 5 Perception, access, and satisfaction of MHPs with telepsychiatry.

Statements (N = 235)	Agree/strongly agree. n (%)	Neutral n (%)	Disagree/strongly disagree. n (%)	Mean (SD)
Perceived advantages and disadvantages for doctors and patients				
All types of patients/customers and diagnoses are suitable for telepsychiatry treatment	103 (43.8)	52 (22.1)	80 (34.1)	2.1 (1.4)
Telepsychiatry is suitable for all stages of treatment	81 (34.5)	58 (24.7)	96 (40.8)	1.8 (1.3)
Using telepsychiatry takes longer than a face-to-face session ¥	103 (43.8)	69 (29.4)	66 (26.8)	2.1 (1.2)
Telepsychiatry session saved my patients/customers' time	204 (86.8)	23 (9.8)	8 (3.4)	3.2 (0.8)
Workload in local clinics improved with the use of telepsychiatry	183 (77.9)	35 (14.9)	17 (7.2)	2.9 (0.9)
Use of telepsychiatry reduced expenses and costs of service	187 (79.5)	34 (14.5)	14 (6.0)	3.1 (1.0)
Total mean score: Mean (SD)				15 (3.3)
Total mean score percent: Mean (SD)				62.6 (13.9)
Perceived access for patients				
Telepsychiatry sessions allowed my patients or customers to access services earlier than they could have in person	199 (84.6)	22 (9.5)	14 (5.9)	3.1(0.9)
Use of telepsychiatry helped to overcome the cultural and language barriers	162 (69.0)	49 (20.8)	24 (10.2)	2.7 (1.0)
A telepsychiatry session may have made it easier for my patient to get healthcare	205 (87.3)	20 (8.5)	10 (4.2)	3.2 (0.8)
Total mean score: Mean (SD)				9.0 (2.1)
Total mean score percent: Mean (SD)				75.2 (17.4)
Perceived accessibility and access satisfaction				
Technical difficulties made this process too time consuming ¥	136 (57.9)	62 (26.4)	37 (15.7)	2.6 (1.2)
Capable and trained staff were available to provide telepsychiatry services	147 (62.5)	47 (20.0)	41 (17.5)	2.6 (1.2)
I was satisfied with the quality of the picture and audio	170 (72.4)	41 (17.4)	24 (10.2)	2.9 (1.1)
The technology (the normal operation of the instrument rather than any problems encountered) distracted me from the session ¥	123 (52.3)	63 (26.8)	49 (20.9)	2.4 (1.2)
If I had any problems with the telepsychiatry equipment, someone was available to help me	133 (56.5)	50 (21.4)	52 (22.1)	2.4 (1.2)
Overall, the system was accessible and easy to use	195 (83.0)	24 (10.2)	16 (6.9)	3.1 (1.0)
Total mean score: Mean (SD)				11.2 (2.8)
Total mean score percent: Mean (SD)				46.6 (11.7)
Telepsychiatry practice satisfaction				
Telepsychiatry sessions made it easier for me to provide psychiatric services	188 (80.0)	28 (11.9)	19 (8.1)	3.1 (1.0)
The provider-patient rapport was unimpaired using telepsychiatry	150 (63.8)	55 (23.4)	30 (12.8)	2.6 (1.1)
My communication with my patient/customers and/or referring health provider was unimpaired by telepsychiatry	139 (59.2)	63 (26.7)	33 (14.1)	2.6 (1.2)
My patients and customers seemed satisfied with the telepsychiatry sessions	188 (80.0)	34 (14.5)	13 (5.6)	3.0 (0.9)
The inability to touch my patients/customers impaired the diagnosis ¥	124 (52.7)	69 (29.4)	42 (17.9)	2.4 (1.2)
I could accurately assess audible symptoms	173 (73.7)	43 (18.3)	19 (8.1)	2.9 (1.0)
I was unable to observe details of my patient's facial expression and body movements that would have been important in connecting with him/her ¥	162 (68.9)	58 (24.7)	15 (6.4)	2.9 (1.0)
Telepsychiatry sessions may have improved my patients/customers prognosis	168 (71.5)	47 (20.0)	20 (8.6)	2.8 (1.0)
Telepsychiatry improves clinical efficiency	170 (72.3)	46 (19.6)	19 (8.1)	2.8 (1.0)

(Continued)

10.3389/fpsyt.2025.1426998

TABLE 5 Continued

Statements (N = 235)	Agree/strongly agree. n (%)	Neutral n (%)	Disagree/strongly disagree. n (%)	Mean (SD)
Telepsychiatry practice satisfaction				
I would have preferred to see my patients and customers in person ¥	165 (70.2)	58 (24.7)	12 (5.1)	3.0 (1.0)
There is a need for specific training/expertise in order to practice telepsychiatry ¥	184 (78.3)	32 (13.6)	19 (8.1)	3.1 (1.1)
I did perceive ethical, moral or legal problems associated with practicing telepsychiatry ¥	126(53.7)	63 (26.8)	46 (19.5)	2.5 (1.2)
Overall, I was satisfied with telepsychiatry sessions	190 (80.8)	29 (12.3)	16 (6.9)	3.1 (0.9)
I would use telepsychiatry to see patients and customers again	193 (82.1)	28 (11.9)	14 (6.0)	3.1 (1.0)
I would recommend telepsychiatry to my colleagues	192 (81.7)	31 (13.2)	12 (5.1)	3.2 (1.0)
Total mean score: Mean (SD)				34.6 (5.7)
Total mean score percent: Mean (SD)				57.6 (9.6)

¥ Negative statements, where high scores imply dissatisfaction or perceived problems with telepsychiatry.

According to our results, communication with patients, rapport building, preference for in-person consultations, and ethical and moral issues associated with patient management using telepsychiatry were the least satisfactory aspects of their telepsychiatry practice. This is similar to findings of previous research, which showed that professional healthcare providers used to prefer in-person visits, and that patient management typically improves with time and frequent use of telepsychiatry (39).

Eventually, MHPs expressed their willingness to continue using telepsychiatry and to recommend it to their colleagues. This was similar to the findings of Saleh et al. (30), who reported that 89% of MHPs demonstrated willingness to launch telepsychiatry technology at their current workplace, believing that their colleagues would be willing to implement this method (85.7%). Furthermore, they believed telepsychiatry could be integrated into the current medical care system (84.8%). An earlier study by Shittu et al. (40) stated that the willingness of healthcare workers towards telemedicine depends on their current knowledge regarding telehealth applications, the perception of telehealth benefits, and reduced barriers to use.

Though MHP providers agreed that they would continue to use telepsychiatry with patients and would recommend it to colleagues, they also showed high agreement about the need for relevant training in line with the findings reported in a similar study conducted in KSA (30). This finding highlights the emerging need for expanding MHPs' training activities and providing different telehealth platforms and applications to maximize their benefit in saving time and money and improving access for patients. Such trainings should be expanded to include public hospitals where the practice of telepsychiatry is low and among young junior MHPs who are least likely to use this technology, where they need to be well-prepared for electronic health technologies for future applications. Additionally, more efforts are needed to improve patients' awareness of the availability of the service. The importance of such training was highlighted in previous studies conducted in Ethiopia (29) and Pakistan (41), predicting that telepsychiatry training would result in significantly improved MHPs' attitude towards telepsychiatry in addition to equipping the healthcare workplace with the needed technology and personnel.

Limitations of the study

Our study is a national-level assessment covering all regions of Saudi Arabia, providing a broad perspective on telepsychiatry practices. It includes diverse MHPs, both physicians and non-physicians, contributing valuable insights to the limited body of research on telepsychiatry in the country. However, several limitations must be acknowledged. First, while the survey instrument was developed based on a comprehensive literature review and refined through expert consultations, it was not a fully validated tool, which may have introduced variability in responses. The relatively low Cronbach's alpha values for some domains, such as perceived patient access (0.58) and MHPs' access (0.66), suggest moderate internal consistency that could have affected the reliability of the findings. Additionally, approximately 65% of participants worked in the public sector, leading to an underrepresentation of private sector professionals. Psychologists and social workers were also less represented compared to physicians, limiting our ability to capture insights from a broader mental health workforce. This may affect the generalizability of our findings, particularly regarding resource distribution and knowledge accessibility among different MHPs. Furthermore, the study did not explicitly explore key aspects such as specific barriers to telepsychiatry practice, the digital skills of MHPs, the platforms and applications used, or the advantages and disadvantages of each platform. Lastly, as an online survey, participation was inherently limited to MHPs with sufficient digital literacy, introducing potential selection bias. However, recent statistics revealed that nearly 100% of the Saudi population uses the internet, which reduces the risk of selection bias.

Conclusions and recommendations

The findings of this study highlight the need for strategic action to integrate telepsychiatry more effectively into mental healthcare systems in KSA. While MHPs demonstrated a strong awareness of telepsychiatry and recognized its potential benefits, there remains a gap in consistent adoption and utilization. This underscores the importance of targeted capacity-building initiatives to equip MHPs with the necessary skills and confidence to leverage telepsychiatry tools effectively. Policymakers and stakeholders should prioritize investments in digital infrastructure, including reliable internet access and user-friendly e-health platforms, particularly in underserved regions. Additionally, tailored training programs should be developed to address the specific needs of diverse MHP groups, such as junior professionals and non-physician providers, ensuring equitable access to telepsychiatry resources. To foster widespread acceptance and long-term sustainability, ethical, legal, and regulatory frameworks must be established to guide telepsychiatry practice. By addressing these systemic challenges, KSA can enhance the accessibility and quality of mental healthcare services, ultimately improving outcomes for patients and reducing disparities across regions. Further research is needed to identify barriers to telepsychiatry adoption and assess the impact of policy interventions on practice integration. Future studies should explore user acceptance using theoretical models such as the Unified Theory of Acceptance and Use of Technology (UTAUT) (42) and the Theory of Planned Behavior (TPB) (43).

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material. Further inquiries can be directed to the corresponding author/s.

Author contributions

OA: Writing – original draft. LA: Project administration, Writing – original draft. IB: Methodology, Writing – original draft. AA: Writing – original draft. RS: Conceptualization, Supervision, Writing – review & editing. RG: Conceptualization, Validation, Writing – original draft. ME: Formal analysis, Funding acquisition, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research and/or publication of this article. This research work was funded by Umm AI-Qura University, Saudi Arabia under grant number: 25UQU4320605GSSR02.

Acknowledgments

The authors extend their appreciation to Umm AI-Qura University, Saudi Arabia for funding this research work through grant number: 25UQU4320605GSSR02.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2025.1426998/full#supplementary-material

References

1. Drago A, Winding TN, Antypa N. Videoconferencing in psychiatry, a meta-analysis of assessment and treatment. *Eur Psychiatry*. (2016) 36:29–37. doi: 10.1016/j.eurpsy.2016.03.007

2. Alghamdi SA, Alshahrani OM, Alharbi AK, Alghamdi OA, Almohaini RA, Alsayat JY. Telepsychiatry: knowledge, effectiveness, and willingness; assessments of psychiatrists in Saudi Arabia. *Neurosci (Riyadh)*. (2022) 27:79–86. doi: 10.17712/nsj.2022.2.20210125

3. Malhotra P, Ramachandran A, Chauhan R, Soni D, Garg N. Assessment of knowledge, perception, and willingness of using telemedicine among medical and allied healthcare students studying in private institutions. *Telehealth Med Today*. (2020) 5:1–14. doi: 10.30953/tmt.v5.228

4. Abuyadek RM, Hammouda EA, Elrewany E, Elmalawany DH, Ashmawy R, Zeina S, et al. Acceptability of tele-mental health services among users: a systematic review and meta-analysis. *BMC Public Health*. (2024) 24:1143. doi: 10.1186/s12889-025-21277-7

5. Chen Q, Huang S, Xu H, Peng J, Wang P, Li S, et al. The burden of mental disorders in Asian countries, 1990–2019: An analysis for the global burden of disease study 2019. *Trans Psychiatry*. (2024) 14:167. doi: 10.1038/s41398-024-02864-5

6. Altwaijri YA, Al-Habeeb A, Al-Subaie AS, Bilal L, Al-Desouki M, Shahab MK, et al. Twelve-month prevalence and severity of mental disorders in the Saudi National Mental Health Survey. *Int J Methods Psychiatr Res*. (2020) 29:e1831. doi: 10.1002/mpr.1831

7. Noorwali R, Almotairy S, Akhder R, Mahmoud G, Sharif L, Alasmee N, et al. Barriers and facilitators to mental health help-seeking among young adults in Saudi Arabia: a qualitative study. *Int J Environ Res Public Health*. (2022) 19:2848. doi: 10.3390/ijerph19052848

8. Al-Garni AM, Shati AA, Almonawar NA, Alamri GM, Alasmre LA, Saad TN, et al. Prevalence of depression, anxiety, and stress among students enrolled at King Khalid University: a cross-sectional study. *BMC Public Health*. (2025) 25:354. doi: 10.1186/s12889-025-21277-7

9. Salaheddin K, BJBJoGP M. Identifying barriers to mental health help-seeking among young adults in the UK: a cross-sectional survey. *Br J Gen Practice*. (2016) 66: e686–e92. doi: 10.3399/bjgp16X687313

10. Alaqeel M, Alkhudairy FA, Basuliman AS, Alsubaie AM, Alqahtani FN, Almkainzi HAJC. The barriers to seeking mental health Services at King Saud bin Abdulaziz University for health sciences. *Cureus*. (2023) 15:1–9. doi: 10.7759/cureus.45321

11. NAJJoE A, Promotion H. Social barriers as a challenge in seeking mental health among Saudi Arabians. *J Educ Health Promotion*. (2021) 10:143–52. doi: 10.4103/jehp.jehp_819_20

12. Alangari AS, Knox SS, Kristjansson AL, Wen S, Innes KE, Bilal L, et al. Barriers to mental health treatment in the Saudi National Mental Health Survey. *Int J Environ Res Public Health*. (2020) 17:3877. doi: 10.3390/ijerph17113877

13. Alonso J, Liu Z, Evans-Lacko S, Sadikova E, Sampson N, Chatterji S, et al. Treatment gap for anxiety disorders is global: Results of the World Mental Health Surveys in 21 countries. *Depression anxiety*. (2018) 35:195–208. doi: 10.1186/s12889-025-21277-7

14. Consortium WWMHS. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *Jama*. (2004) 291:2581–90. doi: 10.1001/jama.291.21.2581

15. Downes E, Horigan A, PJJotAAoNP T. The transformation of health care for patients: Information and communication technology, digiceuticals, and digitally enabled care. *J Am Assoc Nurse Practitioners*. (2019) 31:156–61. doi: 10.1097/JXX.0000000000000109

16. IdA B, MJPd S. Nursing care by telehealth: what is the influence of distance on communication? *Rev Bras enfermagem*. (2017) 70:928–34. doi: 10.1590/0034-7167-2016-0142

17. Haleem A, Javaid M, Singh RP, Suman R. Telemedicine for healthcare: Capabilities, features, barriers, and applications. *Sensors Int*. (2021) 2:100117. doi: 10.1016/j.sintl.2021.100117

18. World Health O. Telemedicine: opportunities and developments in member states. In: *Report on the second global survey on eHealth*. World Health Organization (2010). Available online at: https://cir.nii.ac.jp/crid/1130282270474112512.

19. Özgüç S, Tanrıverdi D. Tele-psychiatry. *J Psychiatr Nursing/Psikiyatri Hemsireleri Dernegi*. (2019) 10:303–8.

20. Kavoor AR. COVID-19 in people with mental illness: challenges and vulnerabilities. *Asian J Psychiatry*. (2020) 51:102051. doi: 10.1016/j.ajp.2020.102051

21. Abd ElHafeez S, e Cruz MM, Gouda S, Nofal M, Fayed A, Ghazy RM, et al. Sleep quality and anxiety among Egyptian population during covid-19 pandemic. *Sleep Science*. (2022) 15:8–16. doi: 10.1016/j.eurpsy.2016.03.007

22. Holton A, Brantley T, Duda AJNCI. Telepsychiatry in North Carolina: Mental health care comes to you. *North Carolina Insight*. (2014) 24:2–15.

23. Kasckow J, Felmet K, Appelt C, Thompson R, Rotondi A, Haas GJ. Telepsychiatry in the assessment and treatment of schizophrenia. *Clin Schizophr related psychoses*. (2014) 8:21–7A. doi: 10.3371/CSRP.KAFE.021513

24. Mucic D, Shore J, Hilty DM. The world psychiatric association telepsychiatry global guidelines. *J Technol Behav Sci*. (2023) 3:1–8. doi: 10.1007/s41347-023-00339-w

25. Torous J, Myrick KJ, Rauseo-Ricupero N, Firth J. Digital mental health and COVID-19: using technology today to accelerate the curve on access and quality tomorrow. *JMIR Ment Health*. (2020) 7:e18848. doi: 10.2196/18848

26. Parimbelli E, Bottalico B, Losiouk E, Tomasi M, Santosuosso A, Lanzola G, et al. Trusting telemedicine: a discussion on risks, safety, legal implications and liability of involved stakeholders. *Int J Med informatics*. (2018) 112:90–8. doi: 10.1016/j.ijmedinf.2018.01.012

27. Almutairi AG, Almutairi SA, Almutairi AA, Althobaiti NNH, Alrashedi KAT, Alotaibi MFJ. Telehealth in Saudi Arabia: its evolution, present infrastructure, and forward-looking implications. *Global J Health Science*. (2023) 15:53–7. doi: 10.17712/nsj.2022.2.20210125.

28. TJJomh A. A review of mobile applications available in the app and google play stores used during the COVID-19 outbreak. *J Multidiscip healthcare*. (2021) 9:45–57.

29. Adem JB, Melaku MS, Zeleke T, Tesfaye M, Kitila FL, Walle AD. Attitude of mental healthcare providers toward tele-psychiatry services and associated factors at public referral hospitals in Addis Ababa city, Ethiopia. *Int J Ment Health Systems*. (2023) 17:26. doi: 10.1186/s13033-023-00596-5

30. Saleh AA, Osamah MA, Abdulmajeed KA, Omar AA, Reem AA, Jouf YA. Telepsychiatry: knowledge, effectiveness, and willingness; assessments of psychiatrists in Saudi Arabia. *Neurosci J*. (2022) 27:79. doi: 10.17712/nsj.2022.2.20210125

31. Albarrak AI, Mohammed R, Almarshoud N, Almujalli L, Aljaeed R, Altuwaijiri S, et al. Assessment of physician's knowledge, perception and willingness of telemedicine in Riyadh region, Saudi Arabia. *J infection Public Health*. (2021) 14:97–102. doi: 10.1016/j.jiph.2019.04.006

32. Wojtuszek M, Kachnic J, Wutke J, Krysta K. Telepsychiatry in the opinion of Polish patients and psychiatrists. *Eur Psychiatry*. (2016) 33:S609–S. doi: 10.1016/j.eurpsy.2016.01.2278

33. Abou-Shaaban RR, Niazy EMJG. Telemedicine and telepharmaceutical services: A model to improve maldistribution of medical resources between regions & urban/rural sectors in the kingdom of Saudi Arabia. *GeoJournal*. (1991) 25:401–12. doi: 10.1007/BF02439492

34. Khalil M, Al-Mushkhes H, Alzain NM, AlNabood MA, Al-Mansour A, Al-Mulla MJ, et al. Attitudes toward telepsychiatry among psychiatrists at King Fahad University Hospital and Eradah Complex and Mental Health: a Saudi Arabian study. *Int J Med Developing Countries*. (2022) 7:239–48. doi: 10.24911/IJMDC.51-1668442016

35. de las Cuevas C, Gutiérrez-Rojas L, Alvarez-Mon MA, Andreu-Bernabeu Á, Capitán L, Gómez JC, et al. Evaluating the effect of a telepsychiatry educational program on the awareness, knowledge, attitude, and skills of telepsychiatry among spanish psychiatrists during COVID-19 pandemic. *Telemedicine e-Health*. (2022) 29:102–8. doi: 10.1089/tmj.2022.0051

36. Roncero C, Remon-Gallo D, Casado-Espada N, Aguilar L, Gamonal-Limcaoco S, Gallego MT, et al. Healthcare professionals' perception and satisfaction with mental health tele-medicine during the COVID-19 outbreak: A real-world experience in telepsychiatry. *Front Psychiatry*. (2022) 13. doi: 10.3389/fpsyt.2022.981346

37. Sharma R, Das K, Shah R, Singh P, Knowledge A. awareness and utilization of telepsychiatry services among health care professionals. *Delhi Psychiatry J*. (2019) 22:298. doi: 10.1186/s43045-022-00272-3

38. Zayapragassarazan Z, Kumar S. Awareness, knowledge, attitude and skills of telemedicine among health professional faculty working in teaching hospitals. *J Clin Diagn research: JCDR*. (2016) 10:JC01. doi: 10.7860/JCDR/2016/19080.7431

39. Cowan KE, McKean AJ, Gentry MT, Hilty DM. Barriers to use of telepsychiatry: clinicians as gatekeepers. *Mayo Clinic Proc*. (2019) 94:2510–23. doi: 10.1016/j.mayocp.2019.04.018

40. Shittu L, Adesanya O, Izegbu M, Oyewopo A, Ade A, Ashiru OA. Knowledge and perception of health workers towards tele-medicine application in a new teaching hospital in Lagos. *Sci Res Essay*. (2007) 2:016–9.

41. Ashfaq A, Memon SF, Zehra A, Barry S, Jawed H, Akhtar M, et al. Knowledge and attitude regarding telemedicine among doctors in Karachi. *Cureus*. (2020) 12:1–6. doi: 10.7759/cureus.6927

42. Venkatesh V, Raji R, Cruz-Jesus F. AI and emerging technology adoption: a research agenda for operations management. *Int J Production Res*. (2024) 62:5367–77. doi: 10.1080/00207543.2023.2192309

43. Ajzen I. The theory of planned behavior. *Organizational Behav Hum decision processes*. (1991) 50:179–211. doi: 10.1016/0749-5978(91)90020-T

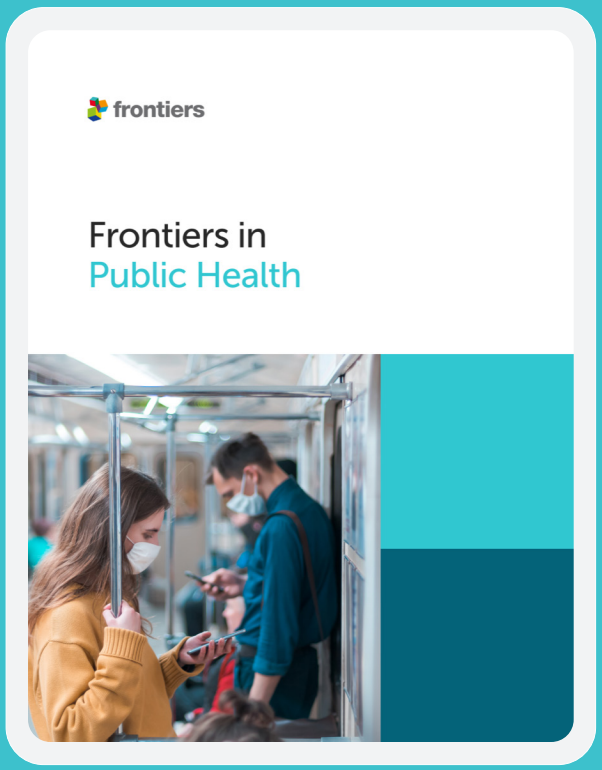
Frontiers in Public Health

Explores and addresses today's fast-moving healthcare challenges

One of the most cited journals in its field, which promotes discussion around inter-sectoral public health challenges spanning health promotion to climate change, transportation, environmental change and even species diversity.

Discover the latest Research Topics

See more →



Frontiers

Avenue du Tribunal-Fédéral 34
1005 Lausanne, Switzerland
frontiersin.org

Contact us

+41 (0)21 510 17 00
frontiersin.org/about/contact