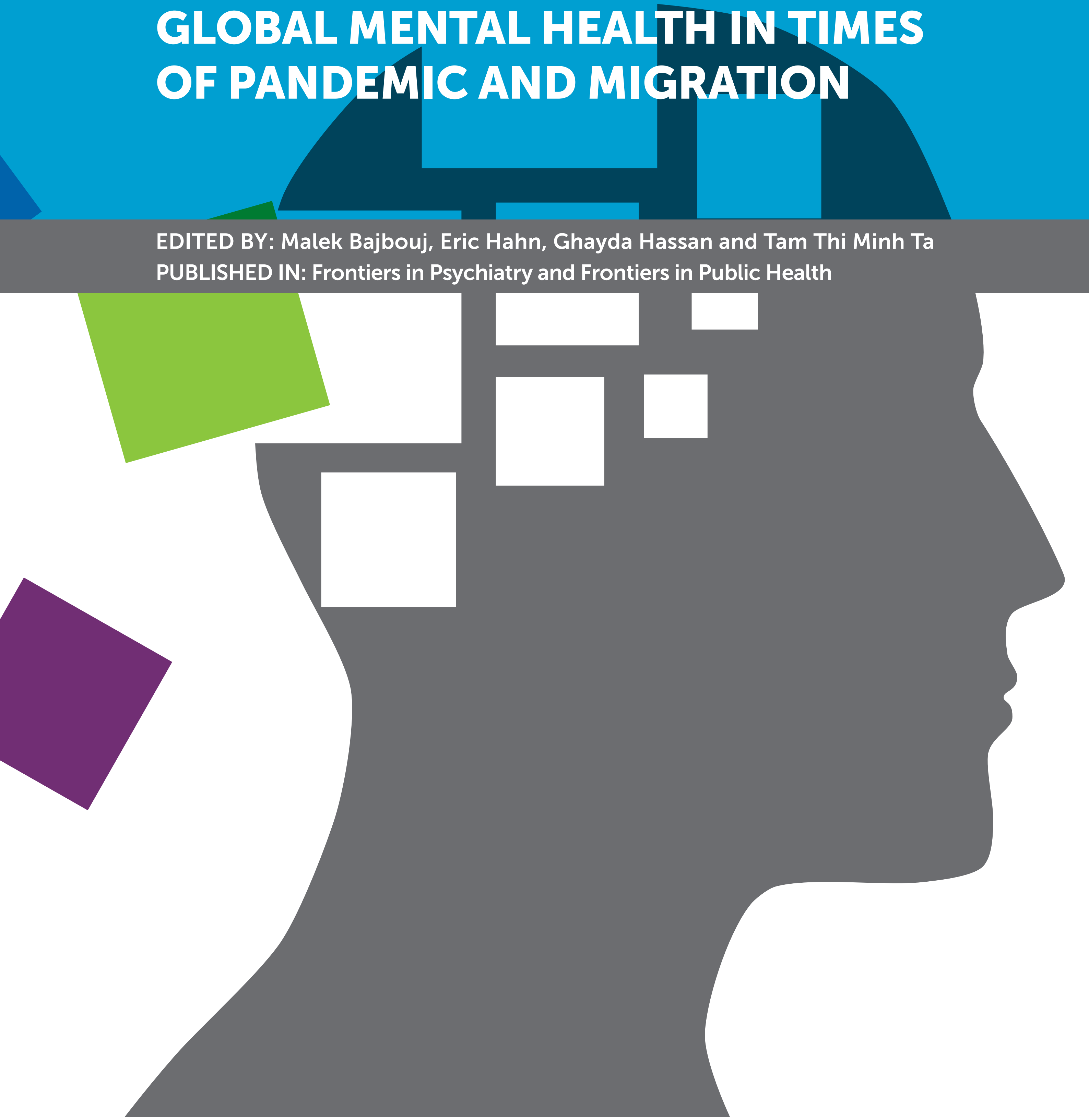
GLOBAL MENTAL HEALTH IN TIMES OF PANDEMIC AND MIGRATION

EDITED BY: Malek Bajbouj, Eric Hahn, Ghayda Hassan and Tam Thi Minh Ta
PUBLISHED IN: Frontiers in Psychiatry and Frontiers in Public Health



frontiers Research Topics

ISSN 1664-8714
ISBN 978-2-88974-421-3
DOI 10.3389/978-2-88974-421-3

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

GLOBAL MENTAL HEALTH IN TIMES OF PANDEMIC AND MIGRATION

Topic Editors:
Malek Bajbouj, Charité Universitätsmedizin Berlin, Germany
Eric Hahn, Charité Universitätsmedizin Berlin, Germany
Ghayda Hassan, Université du Québec à Montréal, Canada
Tam Thi Minh Ta, Charité University Medicine Berlin, Germany

Citation: Bajbouj, M., Hahn, E., Hassan, G., Ta, T. T. M., eds. (2022). Global Mental Health in Times of Pandemic and Migration. Lausanne: Frontiers Media SA.
doi: 10.3389/978-2-88974-421-3

Table of Contents

05 ***Editorial: The Nine Grand Challenges in Global Mental Health***
Malek Bajbouj, Thi Minh Tam Ta, Ghayda Hassan and Eric Hahn

09 ***Anxiety and Depression Symptoms in COVID-19 Isolated Patients and in Their Relatives***
Shirel Dorman-Ilan, Nimrod Hertz-Palmor, Ayelet Brand-Gothelf, Ilanit Hasson-Ohayon, Noam Matalon, Raz Gross, Wendy Chen, Ayelet Abramovich, Arnon Afek, Amitai Ziv, Yitshak Kreiss, Itai M. Pessach and Doron Gothelf

15 ***Exploring the Representation of Depressive Symptoms and the Influence of Stigma in Arabic-Speaking Refugee Outpatients***
Nico Lindheimer, Carine Karnouk, Eric Hahn, Dana Churbaji, Laura Schilz, Diana Rayes, Malek Bajbouj and Kerem Böge

27 ***Sociodemographic and Clinical Predictors of the Length of Psychiatric Inpatient Stay of Immigrants in Switzerland***
Renée Frizi, Barbara Lay, Erich Seifritz, Wolfram Kawohl, Benedikt Habermeyer and Patrik Roser

36 ***Mental Health Determinants Among a Psychiatric Outpatient Sample of Vietnamese Migrants in Germany***
Simon Wolf, Eric Hahn, Katja Wingenfeld, Main Huong Nguyen, Anita von Poser, Thi Hoa Nguyen, Bernd Hanewald, Kerem Böge, Malek Bajbouj, Michael Dettling, Van Tuan Nguyen and Thi Minh Tam Ta

46 ***A Central Clearing Clinic to Provide Mental Health Services for Refugees in Germany***
Malek Bajbouj, Patricia Panneck, Sibylle-Maria Winter, Carlos Ajami, Jihad Alabdullah, Max Benedikt Burger, Anja Haberlandner, Eric Hahn, Andreas Heinz, Isabella Heuser, Armin Hoyer, Ulrike Kluge, Marion Aichberger, Dimitris Repantis, Stefanie Schreiter, Joachim Seybold and Igor Sutej

53 ***Faith-Based Coping Among Arabic-Speaking Refugees Seeking Mental Health Services in Berlin, Germany: An Exploratory Qualitative Study***
Diana Rayes, Carine Karnouk, Dana Churbaji, Lena Walther and Malek Bajbouj

63 ***Using Mind-Body Medicine to Reduce the Long-Term Health Impacts of COVID-Specific Chronic Stress***
Vojislav Maric, Jyoti Mishra and Dhakshin S. Ramanathan

67 ***A Systematic Review of Factors Affecting Mental Health and Well-Being of Asylum Seekers and Refugees in Germany***
Vivien L. Hajak, Srishti Sardana, Helen Verdeli and Simone Grimm

82 ***Health Care Workers' Mental Health During the First Weeks of the SARS-CoV-2 Pandemic in Switzerland—A Cross-Sectional Study***
Sonja Weilenmann, Jutta Ernst, Heidi Petry, Monique C. Pfaltz, Onur Sazpinar, Samuel Gehrke, Francesca Paolercio, Roland von Känel and Tobias R. Spiller

91 ***Immediate Psychological Responses, Stress Factors, and Coping Behaviors in Military Health-Care Professionals During the COVID-19 Pandemic in Tunisia***
Hela Slama, Hamdi El Kefi, Karima Taamallah, Nejla Stambouli, Anis Baffoun, Walid Samoud, Chaker Bechikh, Abdelaziz Oumaya, Khaled Lamine, Mohamed Jalel Hmida, Hichem Slama, Mustapha Ferjani and Hedi Gharsallah

102 ***Rapid Evidence Assessment of Mental Health Outcomes of Pandemics for Health Care Workers: Implications for the Covid-19 Pandemic***
Sara Waring and Susan Giles

114 ***Adverse Childhood Experiences and Mindfulness in Chinese College Students During the COVID-19 Pandemic***
Chienchung Huang, Meifen Yang, Yun Geng, Yafan Chen, Shannon P. Cheung, Guosheng Deng, Qiang Dong, Hongwei Hu, Kai Hua, Jinyu Liao, Yuanfa Tan, Bin Tu, Enjian Wang, Zhihong Yu, Congcong Zhang, Shuyan Zhang and Gaosheng Zhuo

123 ***The Differential Impact of Lockdown Measures Upon Migrant and Female Psychiatric Patients – A Cross-Sectional Survey in a Psychiatric Hospital in Berlin, Germany***
James K. Moran, Joachim Bretz, Johanna Winkler, Stefan Gutwinski, Eva J. Brandl and Meryam Schouler-Ocak

131 ***Mental Health, Culture and Resilience—Approaching the COVID-19 Pandemic From a South African Perspective***
Sibongile Mashaphu, Mvuyiso Talatala, Sebolelo Seape, Lennart Eriksson and Bonginkosi Chiliza

136 ***Mental Health Self-Stigma of Syrian Refugees With Posttraumatic Stress Symptoms: Investigating Sociodemographic and Psychopathological Correlates***
Jonathan Bär, Alexander Pabst, Susanne Röhr, Melanie Luppa, Anna Renner, Michaela Nagl, Judith Dams, Thomas Grochtdreis, Anette Kersting, Hans-Helmut König and Steffi G. Riedel-Heller

147 ***Mental Disorders Among Health Care Workers at the Early Phase of COVID-19 Pandemic in Kenya; Findings of an Online Descriptive Survey***
Edith Kamaru Kwobah, Ann Mwangi, Kirtika Patel, Thomas Mwogi, Robert Kiptoo and Lukoye Atwoli

158 ***Mental Health and Integration: A Qualitative Study on the Struggles of Recently Arrived Refugees in Germany***
Lena Walther, Diana Rayes, Julia Amann, Uwe Flick, Thi Minh Tam Ta, Eric Hahn and Malek Bajbouj

175 ***Doctors Dealing With COVID-19 in Pakistan: Experiences, Perceptions, Fear, and Responsibility***
Inayat Ali, Salma Sadique and Shahbaz Ali

frontiers in Psychiatry

EDITORIAL
published: 11 January 2022
doi: 10.3389/fpsyt.2021.822299

Editorial: The Nine Grand Challenges in Global Mental Health

Malek Bajbouj[1]*, **Thi Minh Tam Ta**[1], **Ghayda Hassan**[2] and **Eric Hahn**[1]

[1] Global Mental Health Section, Department of Psychiatry, Charité – Universitaetsmedizin Berlin, Berlin, Germany,
[2] Department of Psychology, Université du Québec à Montréal, Montréal, QC, Canada

Keywords: global health, migration, pandemic, education, health literacy, health disadvantage

Editorial on the Research Topic

Global Mental Health in Times of Pandemic and Migration

Grand global challenges significantly impact mental health and well-being in vulnerable populations across the globe. Today, national health systems and infrastructures are often not sufficiently equipped to react effectively to these grand challenges' multiple and interrelated consequences. The World Health Organization has identified 13 urgent health challenges for the upcoming decade (see **Table 1**). From our perspective, nine of these challenges are crucial not only for global health but also for Global Mental Health.

CHALLENGE 1: HEALTH IN CONFLICT AND CRISIS SETTINGS

Displacement due to conflict (such as in Syria, Yemen, the Central African Republic, Congo, South Sudan) or extreme violence (inflicted upon Rohingya) affected millions of people worldwide. As a direct consequence, the World Migration Report counted 272 million people as migrants (3.5% of the world's population). The global refugee population amounted to 25.9 million. The number of internally displaced people reached 41.3 million (1). These numbers are of relevance for mental health for two reasons: first, a significant proportion of refugees and migrants have been exposed to violence (2) and went through traumatic experiences [(3); Walther et al.] in their home countries or during the flight. Second, after arrival in the receiving countries, refugees, migrants, and asylum seekers experience a variety of postmigration stressors such as unclear legal status, unemployment, the absence of the core family, or the housing situation [(4); Hajak et al.]. These stressors and traumatic experiences before, during, and after flight are likely to impact incidence rates of stress-related (pooled prevalence 29.9%) and posttraumatic disorders [pooled prevalence: 39.8%; (5)].

CHALLENGE 2: ACCESS TO TREATMENT AND MEDICAL SERVICES

Thus, it is evident that migrants, refugees, and asylum seekers are overrepresented in clinical populations with mental disorders (6). However, this phenomenon is not restricted to mental health: migrants have a higher likelihood of obesity and are often more likely to live an unhealthier lifestyle [e.g., smoking, (7)]. Against this background, it is mandatory that this vulnerable population is provided with context-sensitive and privileged access to health care facilities. However, the opposite is the case. In many regions of the world, universal health coverage (UHC) paradoxically builds multiple barriers toward and within the health care system for migrants and refugees as one of the most vulnerable groups. In addition, refugees and migrants face additional

Edited and reviewed by:
Wulf Rössler,
Charité University Medicine
Berlin, Germany

****Correspondence:***
Malek Bajbouj
malek.bajbouj@charite.de

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *25 November 2021*
Accepted: *07 December 2021*
Published: *11 January 2022*

Citation:
Bajbouj M, Ta TMT, Hassan G and Hahn E (2022) Editorial: The Nine Grand Challenges in Global Mental Health. Front. Psychiatry 12:822299. doi: 10.3389/fpsyt.2021.822299

TABLE 1 | Grand challenges in global (mental) health.

	Challenge	Impact for global mental health
1	Conflict settings	Risk factors for affective disorders and posttraumatic stress disorders
2	Health disparities	General risk factor for mental disorders
3	Public trust	Strategy to increase public awareness and overcome stigma and mental health-related discrimination
4	Access to medicine	Prerequisite to provide successful diagnostic, preventive, and therapeutic interventions
5	Pandemics	Collateral damage on mental health due to measures against pandemics and potential socioeconomic burden
6	Climate crisis	Direct and indirect risk factors for mental disorders
7	New technologies	Strategy to strengthen mental health systems in LMICs
8	Education of health workers	Strategy to strengthen mental health systems in LMICs
9	Child and adolescence health	Vulnerable population
10	Dangerous products	
11	Water, sanitation, and hygiene	
12	Antimicrobial resistance	
13	Stopping infectious diseases	

difficulties such as poor health literacy as well as language and cultural barriers. Therefore, it is surprising that in countries like Germany, migrants have a lower mortality as compared to individuals within the German non-migrant populations (8). Since this observation is likely to be due to a highly selected migrant population, it is essential to develop institutional and procedural strategies to overcome barriers. These strategies are available as illustrated by the example of a central clearing clinic (Bajbouj et al.) and resource-saving stepped and collaborative care models (9).

CHALLENGE 3: PUBLIC TRUST AND HEALTH LITERACY

The best health infrastructure and the largest mental health care resources are of no value if affected populations are stigmatized or if no knowledge exists regarding diseases or treatment options on the caretakers' side. Equally important, health literacy needs to be present on the caregivers' side with respect to cultural differences in idioms of distress or concerning culture-sensitive treatment modifications (10, 11). Two examples of interventions considering cultural aspects are in diagnostics (Lindheimer et al.) and therapy (Rayes et al.) are provided in this special issue, as well as insights into the role of stigma in the provision of mental health services in Germany (Lindheimer et al.; Bär et al.), Jordan, and the Kurdistan Region of Iraq (12, 13).

CHALLENGE 4: HEALTH DISPARITIES

Despite the higher risk of developing mental disorders, migrants and refugees seem to be at a significant disadvantage within specialized mental health care with lower rates of hospitalization, the lower likelihood for referral to mental health specialists, and higher rates of treatment discontinuation (14, 15) as well as shorter treatment duration of inpatients in psychiatric wards (Frizi et al.). The phenomenon of health disparities in health systems is universal, not specific to mental health care and general drivers of inequity such as socioeconomic status, neighborhood, and insurance status can potentially impact all medical disciplines (16).

CHALLENGE 5: MENTAL HEALTH CARE IN PANDEMICS

The current COVID-19 pandemics have deciphered difficulties in accessing health structures, lack of public trust, and health disparities in mental health care across the globe. The pandemic served as an acute stressor for health systems and their health workers, as illustrated in quantitative and qualitative studies from Tunisia (Slama et al.), Kenya (Kwobah et al.), Pakistan (Ali et al.), and Switzerland (Weilenmann et al.). Importantly, the pandemic-related stress in healthcare workers has both short-term and considerable long-term effects on the incidence of affective and posttraumatic stress disorders (Waring and Giles). But pandemics impact mental health beyond health care workers. Beyond them, COVID-19 patients and their relatives experience high anxiety levels (Dorman-Ilan et al.). These effects seem to be pronounced in vulnerable populations such as migrants (Moran et al.) or with adverse childhood experiences (Huang et al.). For those beneficiaries, but also for health care professionals, various low-threshold interventions had been suggested to overcome such pandemic-related stress, including very basic psychosocial interventions such as exercise, mindfulness practices, religious practices, or social engagement that are preferably applied in group settings (Mashaphu et al.; Maric et al.).

CHALLENGE 6: HEALTH AND CLIMATE CRISIS

There is increasing evidence that climate change does have direct and indirect effects on mental health. Direct effects comprise phenomenons such as eco-anxiety or exacerbation of existing severe mental disorders by adverse environmental factors (17). Indirect effects are due to the socioeconomic impacts of climate change which in turn constitute risk factors for a variety of psychiatric syndromes and disorders such as suicidality, affective disorders, or addiction (18).

CHALLENGE 7: NEW TECHNOLOGIES

Across the globe, there is a need for health care strengthening and a need to address the psychological needs of patients with mental disorders (19). New technologies may provide the opportunity to overcome these by connecting beneficiaries of low- and middle-income countries to experts in better-positioned regions of the world, by broadly providing health literacy programs, low threshold interventions (20), or by educating health care workers (see challenge 8). On the other hand, new digital technologies pose a risk of substituting evidence-based mental health interventions and promoting less rigorously evaluated treatments for persons living in LMICs.

CHALLENGE 8: EDUCATION OF HEALTH WORKERS

Treatment of patients with mental disorders needs relevant, and thus context adapted human capacities in the mental health sector. To strengthen mental health systems, especially in LMICs, awareness in policymakers and planners (21) is required as well as structured training programs for mental health care providers. An evident approach to addressing this medical need is to increase the capacity to train experts of different disciplines regionally working in the field. Stigmatization of mental disorders, lack of existing training structures, and political preferences constitute significant barriers that need to be addressed to build significant capacities in this highly significant field of medicine and health care (22).

CHALLENGE 9: CHILD AND ADOLESCENCE HEALTH

29.3% of the global population is younger than 18 years. This population is especially vulnerable to external stressors resulting in immediate responses or later programming of mental disorders (23, 24). Although the need to primarily protect this subpopulation is obvious, the availability of training of respective specialists and tailored interventions is widely lacking, especially in LMICs. Thus, it constitutes a global challenge to promote population-based interventions to improve mental health in this highly vulnerable and large subpopulation. Against this background, the articles of the current Research Topic "*Global Mental Health in Times of Pandemic and Migration*" shed light on the multiple interdependencies between mediating factors of mental health, for instance, maternal health [(25), in this issue], and these global challenges and their impact on individuals, populations, and societies across the globe. The special issue brings eleven national perspectives describing specific and general problems within mental health care systems and suggests generalizable solutions addressing the nine challenges in global mental health.

AUTHOR CONTRIBUTIONS

MB wrote the first draft of the editorial and developed the conceptional background. TT, GH, and EH further developed the concept and extended the manuscript with relevant content. All authors contributed to the article and approved the submitted version.

ACKNOWLEDGMENTS

We thank all authors for their valuable contributions.

REFERENCES

1. World Migration Report (2021). Available online at: https://publications.iom.int/system/files/pdf/wmr_2020.pdf
2. Abbott A. The mental-health crisis among migrants. *Nature.* (2016) 538:158–160.
3. Arsenijević J, Schillberg E, Ponthieu A, Malvisi L, Ahmed WAE, Argenziano S, et al. A crisis of protection and safe passage: violence experienced by migrants/refugees travelling along the Western Balkan corridor to Northern Europe. *Confl Health.* (2017) 11:6.
4. Walther L, Kröger H, Tibubos AN, Ta TMT, von Scheve C, Schupp J, et al. Psychological distress among refugees in Germany: a cross-sectional analysis of individual and contextual risk factors and potential consequences for integration using a nationally representative survey. *BMJ Open.* (2020) 10:e033658. doi: 10.1136/bmjopen-2019-033658
5. Hoell A, Kourmpeli E, Salize HJ, Heinz A, Padberg F, Habel U, et al. Prevalence of depressive symptoms and symptoms of posttraumatic stress disorder among newly arrived refugees and asylum seekers in Germany: systematic review and meta-analysis. *BJPsych Open.* (2021) 7:e93. doi: 10.1192/bjo.2021.54
6. Ng E, Zhang H. The mental health of immigrants and refugees: Canadian evidence from a nationally linked database. *Health Rep.* (2020) 31:3–12. doi: 10.25318/82-003-x202000800001-eng
7. Statistisches Bundesamt. *Bevölkerung und Erwerbstätigkeit. Bevölkerung mit Migrationshintergrund - Ergebnisse des Mikrozensus 2013.* Fachserie 1, Reihe 2.2. Destatis, Wiesbaden (2014).
8. Kohls M. *Morbidity and Mortality of Migrants. Forschungsbericht/Bundesamt für Migration und Flüchtlinge (BAMF) Forschungszentrum Migration, Integration und Asyl* (FZ). (2011).
9. Böge K, Karnouk C, Hahn E, Schneider F, Habel U, Banaschewski T, et al. Mental health in refugees and asylum seekers (MEHIRA): study design and methodology of a prospective multicentre randomized controlled trail investigating the effects of a stepped and collaborative care model. *Eur Arch Psychiatry Clin Neurosci.* (2020) 270:95–106. doi: 10.1007/s00406-019-00991-5
10. Böge K, Karnouk C, Hahn E, Demir Z, Bajbouj M. On perceived stress and social support: depressive, anxiety and trauma-related symptoms in arabic-speaking refugees in Jordan and Germany. *Front Public Health.* (2020) 8:239. doi: 10.3389/fpubh.2020.00239
11. Purgato M, Carswell K, Tedeschi F, Acarturk C, Anttila M, Au T, et al. Effectiveness of self-help plus in preventing mental disorders in refugees and asylum seekers in Western Europe: a multinational randomized controlled trial. *Psychother Psychosom.* (2021) 90:403–14. doi: 10.1159/000517504
12. Karnouk C, Böge K, Hahn E, Strasser J, Schweininger S, Bajbouj M. Psychotherapy in Jordan: an investigation of the host and syrian refugee community's perspectives. *Front Psychiatry.* (2019) 10:556. doi: 10.3389/fpsyt.2019.00556
13. Kokou-Kpolou CK, Moukouta CS, Masson J, Bernoussi A, Cénat JM, Bacqué MF. Correlates of grief-related disorders and mental health outcomes among adult refugees exposed to trauma and bereavement: a systematic review and future research directions. *J Affect Disord.* (2020) 267:171–84. doi: 10.1016/j.jad.2020.02.026
14. Gramaglia C, Gambaro E, Delicato C, Di Marco S, Di Tulli E, Vecchi C, et al. Pathways to and results of psychiatric consultation for patients referred from the emergency department. Are there differences between migrant and native patients? *Transcult Psychiatry.* (2019) 56:167–86. doi: 10.1177/1363461518798844

15. Durbin A, Moineddin R, Lin E, Steele LS, Glazier RH. Mental health service use by recent immigrants from different world regions and by non-immigrants in Ontario, Canada: a cross-sectional study. *BMC Health Serv Res.* (2015) 15:336. doi: 10.1186/s12913-015-0995-9
16. Lavizzo-Mourey RJ, Besser RE, Williams DR. Understanding and mitigating health inequities - past, current, and future directions. *N Engl J Med.* (2021) 384:1681–4. doi: 10.1056/NEJMp2008628
17. Ingle HE, Mikulewicz M. Mental health and climate change: tackling invisible injustice. *Lancet Planet Health.* (2020) 4:e128–30. doi: 10.1016/S2542-5196(20)30081-4
18. Cianconi P, Betrò S, Janiri L. The impact of climate change on mental health: a systematic descriptive review. *Front Psychiatry.* (2020) 11:74. doi: 10.3389/fpsyt.2020.00074
19. Esponda GM, Hartman S, Qureshi O, Sadler E, Cohen A, Kakuma R. Barriers and facilitators of mental health programmes in primary care in low-income and middle-income countries. *Lancet Psychiatry.* (2020) 7:78–92. doi: 10.1016/S2215-0366(19)30125-7
20. Kola L, Kohrt BA, Hanlon C, Naslund JA, Sikander S, Balaji M, et al. COVID-19 mental health impact and responses in low-income and middle-income countries: reimagining global mental health. *Lancet Psychiatry.* (2021) 8:535–50. doi: 10.1016/S2215-0366(21)00025-0
21. Keynejad R, Semrau M, Toynbee M, Evans-Lacko S, Lund C, Gureje O, et al. Building the capacity of policymakers and planners to strengthen mental health systems in low- and middle-income countries: a systematic review. *BMC Health Serv Res.* (2016) 16:601. doi: 10.1186/s12913-016-1853-0
22. Semrau M, Alem A, Ayuso-Mateos JL, Chisholm D, Gureje O, Hanlon C, et al. Strengthening mental health systems in low- and middle-income countries: recommendations from the Emerald programme. *BJPsych Open.* (2019) 5:e73. doi: 10.1192/bjo.2018.90
23. Böge K, Hahn E, Strasser J, Schweininger S, Bajbouj M, Karnouk C. Psychotherapy in the Kurdistan region of Iraq (KRI): preferences and expectations of the Kurdish host community, internally displaced- and Syrian refugee community. *Int J Soc Psychiatry.* (2021) 2021:20764021995219. doi: 10.1177/0020764021995219
24. Sawyer SM, Afifi RA, Bearinger LH, Blakemore SJ, Dick B, Ezeh AC, et al. Adolescence: a foundation for future health. *Lancet.* (2012) 379:1630–40. doi: 10.1016/S0140-6736(12)60072-5
25. Jiang Q, Gua Y, Zhang E, Cohen N, Ohtori M, Sun A, et al. Perinatal mental health problems in rural China: the role of social factors. *Front Psychiatry.* (2021) 12:636875. doi: 10.3389/fpsyt.2021.636875

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 Handling Editor WR declared a shared affiliation, though no other collaboration, with one of the authors MB, TT, and EH at the time of the review.

frontiers in Psychiatry

BRIEF RESEARCH REPORT
published: 14 October 2020
doi: 10.3389/fpsyt.2020.581598

Anxiety and Depression Symptoms in COVID-19 Isolated Patients and in Their Relatives

Shirel Dorman-Ilan[1†], Nimrod Hertz-Palmor[1†], Ayelet Brand-Gothelf[2], Ilanit Hasson-Ohayon[3], Noam Matalon[1], Raz Gross[1,2], Wendy Chen[1], Ayelet Abramovich[1], Arnon Afek[1,2], Amitai Ziv[1,2], Yitshak Kreiss[1,2], Itai M. Pessach[1,2] and Doron Gothelf[1,4]*

[1] Sheba Medical Center, Tel Hashomer, Ramat Gan, Israel, [2] Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel, [3] Bar-Ilan University, Ramat Gan, Israel, [4] Sagol School of Neuroscience, Tel Aviv University, Tel Aviv, Israel

Background: While focusing on the management and care of COVID-19 patients, the mental health of these patients and their relatives is being overlooked. The aim of the current study was to measure anxiety and depression, and to assess their association with socio-demographic and pandemic-related stress factors in COVID-19 patients and their relatives during the initial stage of hospitalization.

Methods: We assessed isolated hospitalized patients ($N = 90$) and their relatives (adults and children, $N = 125$) by phone, 25–72 h following patients' admission. The quantitative measures included the Anxiety and Depression modules of the Patient-Reported Outcomes Measurement Information System (PROMIS) and pandemic-related stress factors. Qualitative measures included questions exploring worries, sadness, and coping modes.

Results: Both patients and relatives suffer from high levels of anxiety and related pandemic worries, with lower levels of depressive symptoms. Compared to adult relatives, child relatives reported significantly lower anxiety. The multivariable logistic regression analysis revealed an increased risk for anxiety among females and a decreased risk among ultra-orthodox participants. While increased anxiety among patients was associated with feelings of isolation, increased anxiety among relatives was associated with a feeling of not being protected by the hospital.

Conclusions: Patients and relatives experience similar high anxiety levels which are more robust in women and lower in ultra-orthodox participants. Our findings indicate that anxiety symptoms of both patients and adult relatives should be addressed.

Keywords: anxiety, depression, COVID-19, patients, relatives, children

Edited by:
Eric Hahn,
Charité—Universitätsmedizin
Berlin, Germany

Reviewed by:
Leonardo Afonso Dos Santos,
Universidade de São Paulo, Brazil
Jana Chihai,
Nicolae Testemitanu State University
of Medicine and Pharmacy, Moldova

****Correspondence:***
Doron Gothelf
gothelf@tauex.tau.ac.il

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

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *09 July 2020*
Accepted: *10 September 2020*
Published: *14 October 2020*

Citation:
Dorman-Ilan S, Hertz-Palmor N, Brand-Gothelf A, Hasson-Ohayon I, Matalon N, Gross R, Chen W, Abramovich A, Afek A, Ziv A, Kreiss Y, Pessach IM and Gothelf D (2020) Anxiety and Depression Symptoms in COVID-19 Isolated Patients and in Their Relatives. Front. Psychiatry 11:581598. doi: 10.3389/fpsyt.2020.581598

INTRODUCTION

To date, empirical focus on mental health during the coronavirus pandemic (COVID-19) addressed two groups—the general population (1) and healthcare providers (2). However, evidence regarding mental health consequences of hospitalized patients with COVID-19 and their relatives is largely lacking.

Patients with COVID-19 and their relatives face a set of major stressors (3). These include social distancing from their loved ones, which increases a sense of uncertainty regarding their health status, and increased family-care burdens and economic stressors (3). The multitasking, uncertainty and strain that many patients and relatives struggle with, puts them at high risk for increased psychological distress. Yet, the mental health aspects of COVID-19 patients and their relatives are being largely overlooked (4).

The first objective of the present study, therefore, was to measure levels of anxiety and depression among COVID-19 patients and their relatives (including both adult and child relatives), during the initial stage of hospitalization. We assumed that patients and their relatives would show similar increased levels of anxiety, and that anxiety levels would be higher than depressive levels. This hypothesis is based upon the unpredictable nature of the COVID-19 and the accompanying uncertainty regarding the course of the illness and its infectious potential, which are key factors for anxiety (5). Among relatives, we hypothesized that children would show decreased anxiety and depression levels, compared to adult relatives. This hypothesis is based on the notion that although children have to deal with the same negative feeling of anxiety as adults, they do not share the same objective burdens as adults, such as caring for family function at this difficult time (6). Our second objective was to examine whether sociodemographic factors, such as sex and religiosity, and pandemic-related stress factors that have been previously identified in regards to COVID-19 and prior pandemics (1, 2), such as social isolation, would be associated with anxiety and depression levels among these populations.

METHODS

Participants and Procedure

Between March 15th and May 1st, 2020, we approached 130 consecutive isolated patients who were hospitalized in specialized units for COVID-19 patients at Sheba Medical Center, and 158 of their first-degree relatives who lived with them prior to their hospitalization. Participants were contacted by phone, 25–72 h following their admission to the hospital, and were offered to undergo a short screening of their emotional distress. After the patient's screening, we asked for his or her consent to approach their first-degree relatives. Adult relatives underwent a similar screening procedure. Children under 18 underwent an abbreviated screening process, adjusted for a younger population. This process included questions about anxiety and depression symptoms but not about pandemic related stress.

Measures

Anxiety and Depression Assessment

We used the Hebrew versions of the Anxiety and Depression modules of the Patient-Reported Outcomes Measurement Information System (PROMIS; see www.nihpromis.org) Adult and Child versions. PROMIS is a validated measure that has good agreement with more common measures such as PHQ-9 and GAD-7 (7, 8). It is used primarily for assesing a variety of mental-health domains among patients of different medical situations (9), and is suitable for adults and children older than 6 years old. PROMIS has an established mean and SD of 50 and 10, respectively. It was validated in Hebrew using standard procedure of translation and back translation by independent bilingual English-Hebrew speakers, as described previously (10, 11).

Pandemic-Related Stress Factors Assessment

COVID-19 related stress domains were assessed with an inventory of *pandemic-related stress factors* (PRSF). The PRSF was compiled from questions that have been shown to be pertinent in previous research on the SARS and N1H1 pandemics (12), were adjusted for the COVID-19 pandemic and applied on a population of Israeli physicians in a previous study (11). The PRSF contain questions focusing on specific worries about contagion (e.g., anxiety about infecting family), feelings of being informed and protected by the authorities, feelings of exhaustion, and social isolation. Only adults answered the PRSF items, since they were previously validated in adult populations and include contents that are not relevant for children (e.g., financial concerns, feeling protected by the government). PRSF items are presented in **Table 1**.

Subjective Experience of Hospitalized Patients and Their Family Members

Three open-ended questions exploring worries, sadness, and coping modes were formulated to elicit spontaneous reports of participant's experiences. Specifically, the questions included: (1) "what do you worry about?"; (2) "what makes you sad?"; (3) "what assisted you to cope with worries and sad mood?." The interviews lasted between 1 and 5 min, and were transcribed by the interviewer. Grounded theory analytic approach (13) was used to evaluate responses to the questions. Since children's answers were too short and limited in content, only adults' answers were coded.

Statistical Analysis

Quantitative Analysis

The PRSF were collapsed into binary values with 1 representing feeling stressed "often" or "always," and 0 representing feeling stressed "never" or "sometimes" (11). PRSF scores were compared between groups using chi square. The PROMIS scores were coded as continuous variables (T scores) using the PROMIS coding system (14).

Within-subject differences in anxiety and depression were tested using repeated measures analysis of variance (ANOVA). We then conducted ANCOVA to compare PROMIS scores between (1) adult patients and relatives, with age, sex and religiosity serving as covariates, and (2) adult and children relatives, with sex and religiosity serving as covariates.

Linear regression models were conducted to elucidate the association between PRSF, sociodemographic properties, and mental health outcomes. Anxiety and depression were the key dependent variables, respectively, and separately for patients and their relatives. Age, sex, religiosity, and PRSF items were included as independent variables.

TABLE 1 | Sociodemographic properties and medical evaluation of study sample.

	Patients	Adult Relatives	Children
Participants, *n* (%)	90 (69.2%)	91 (85.8%)	34 (65.4%)
Dropouts			
Unavailable, *n* (%)	24 (18.5%)	6 (5.7%)	4 (7.7%)
Language and cognitive barriers, *n* (%)	11 (8.5%)	0 (0.0%)	0 (0.0%)
Chose not to participate, *n* (%)	5 (3.8%)	9 (8.5%)	14 (26.9%)
Characteristics			
Age, mean ± SD (range)[a]	49.3 ± 16.0	41.9 ± 17.0	13.0 ± 3.2
Age, range	18–82	18–81	6–17
Sex- male/female, *n* (%)[b]	51/39 (56.7/43.3%)	35/56 (38.5/61.5%)	17/17 (50.0/50.0%)
Religiosity- Ultra-orthodox *n* (%)[c]	33 (36.3%)	31 (34.1%)	19 (55.9%)
Familial proximity to patient			
Spouse, *n* (%)	–	44 (48.4%)	–
Offspring, *n* (%)	–	31 (34.1%)	32 (94.1%)
Parent, *n* (%)	–	14 (15.4%)	–
Sibling, *n* (%)	–	1 (1.1%)	2 (5.9%)
Pandemic related stress factors	**% response often/always**		***p***
Anxiety about infecting family	36.1%	29.1%	0.34
Lack of knowledge about infectiveness and virulence	22.9%	23.1%	0.98
Lack of knowledge about protection and prevention	24.4%	17.9%	0.32
Feeling protected by the government	49.4%	39.7%	0.22
Feeling protected by the hospital	69.0%	59.7%	0.25
Financial concerns	18.8%	25.9%	0.30
Mental exhaustion	25.9%	23.7%	0.74
Sleep disorders	41.3%	27.3%	0.07
Feeling isolated and avoided by others	10.0%	9.0%	0.83

[a] *On independent sample t-test patients were significantly older than relatives* [$t_{(180)} = 3.0, p = 0.003$].

[b] *On chi-square test for independence, sex distribution differed significantly between patients and relatives* [$\chi^2_{(1)} = 5.6, p = 0.018$].

[c] *On chi-square test for independence, differences in religiosity distribution between adult relatives and children were significant* [$\chi^2_{(1)} = 4.9, p = 0.027$].

Qualitative Analysis

Two raters (authors AB-G and IH-O) read the interviews, selected, and agreed upon coding themes for each category, i.e., domains of worries, domains of sadness, and coping modes. Independent coding was conducted for a subsample of 30 participants showing high inter-rater reliability with Kappa coefficients ranging from 0.92 to absolute agreement. The rest of the sample was coded by either one of the raters.

RESULTS

The final sample included 90 patients (69.2% of a total of 130 patients that were approached) and 125 relatives (79.1% of 158 relatives that were approached, adults, and children). The mean number of relatives per patient was 2.09 ± 1.57. 36 patients participated without their relatives, and 11 relatives participated without their hospitalized family member due to language or cognitive barriers of the patient. The rest of the participants were related to at least one other patient or family member. Sociodemographic characteristics of the study sample and the distribution of subjects excluded are presented in **Table 1**.

Quantitative Results

After controlling for sex, age and religiosity, patients and adult relatives reported similar levels of anxiety [$Mean = 57.7 \pm 11.9$ and 59.3 ± 8.4, respectively, $F_{(1,177)} = 0.15$, $p = 0.69$] and depression [$M = 52.2 \pm 8.5$ and 51.7 ± 7.5, respectively, $F_{(1,176)} = 0.95$, $p = 0.33$] and similar degree of pandemic-related stress factors (**Table 1**). Anxiety was significantly higher than depression among adults, both patients and relatives [$F_{(1,177)} = 8.40$, $p = 0.004$], and among children relatives as well [$M = 54.2 \pm 7.0$ vs. $M = 51.1 \pm 7.6$, $F_{(1,30)} = 4.23$, $p = 0.048$]. Compared to adult relatives, relatives who are children reported significantly lower levels of anxiety [$F_{(1,122)} = 5.59$, $p = 0.02$] and similar levels of depression [$F_{(1,121)} = 0.17$, $p = 0.67$]. Anxiety and depression scores are presented in **Figure 1**.

In a linear regression model, sex (being a female) was associated with increased anxiety ($\beta = 0.39$, $p < 0.0001$), whilst ultra-orthodox religiosity was associated with lower anxiety ($\beta = -0.26$, $p < 0.0001$). Feeling isolated and avoided by others was

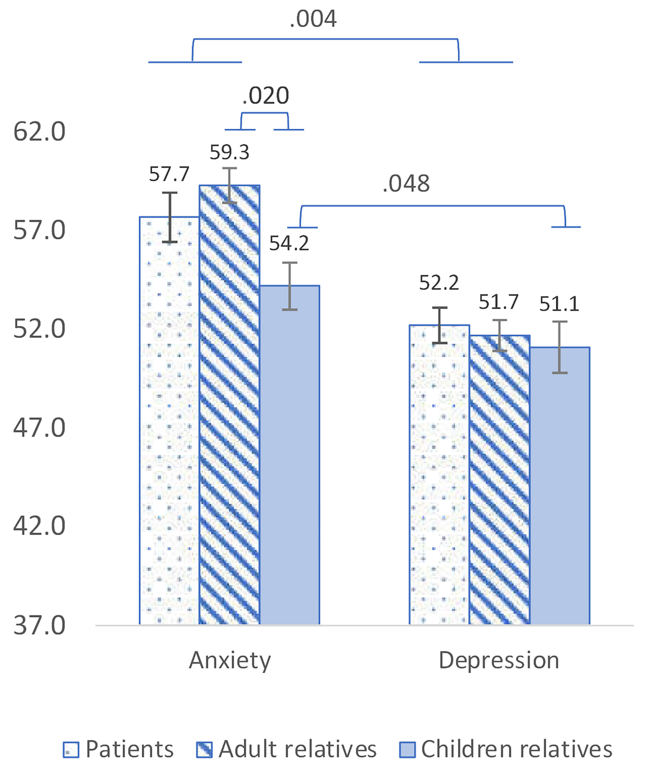


FIGURE 1 | PROMIS Anxiety and Depression mean scores among adult patients, adult relatives and relatives who are children. Anxiety was significantly higher than depression among adults [$F_{(1,177)} = 8.40$, $p = 0.004$] and among children [$F_{(1,30)} = 4.23$, $p = 0.048$]. Compared to adult relatives, relatives who are children reported significantly lower levels of anxiety [$F_{(1,122)} = 5.59$, $p = 0.02$] and similar levels of depression [$F_{(1,121)} = 0.17$, $p = 0.67$].

associated with increased anxiety among patients ($\beta = 0.22$, $p = 0.050$), but not among their relatives. Not feeling protected by the hospital was associated with increased anxiety among relatives ($\beta = -0.29$, $p = 0.003$), but not among patients (**Table 2**). No factors were found to significantly effect depression among neither patients nor among relatives.

Qualitative Results

The central domains of worries most commonly reported by both patients and adult relatives were uncertainty and lack of control (42.5 and 45.5%, respectively) (e.g., "I wish I could know what the prospect, how long will it last"; "he doesn't share with me his feelings; I don't know how he is doing").

Domains of Worries Among Patients

32.5% of the patients reported worry about the well-being of family members at home (e.g., "I am worried about my family members both physically and emotionally, and especially about my parents who are at risk"); 25% reported worry about infecting other people, and only 17.5% reported worry about their own well-being during hospitalization (e.g., privacy, quality of food); 32.5% reported worry about their own health.

Domains of Worries Among Adult Relatives

73.3% of the adult relatives reported worry about their hospitalized family member; 25% worried about the mental health of patients in addition to physical health (e.g., "I'm afraid it will be too much for her emotionally"). 14.5% reported worry that their hospitalized family member will infect others.

Domains of Sadness

Forty-five percent of patients and 25.5% of their relatives reported that they felt sad being distant from family and friends.

Coping Strategies

37.5% of patients and 69.1% of their relatives agreed that support from others helped them (e.g., "feeling that people are with me, that I am not alone"). Other modes of coping were reported by <10% of the patients and relatives including religious coping, a positive approach to life, creative approach (e.g., listening to music, reading), and the use of media. Of the relatives, 27.3% mentioned that working and functioning was an important mode of coping.

DISCUSSION

To our knowledge, this is one of the first studies on mental health among COVID-19 patients, and the first to address relatives of confirmed patients (4). We found that both patients and relatives suffer from high levels of anxiety symptoms and related pandemic worries. While the need to routinely screen patients with medical conditions for anxiety and depression is well-established (10, 15), it was largely overlooked among COVID-19 patients and their relatives (4). There are several unique factors in COVID-19 illness that should predispose patients and relatives to heightened anxiety, including sudden deterioration of health and deaths even in young patients, uncertainty regarding length of isolation, the risk of being infected or infecting others and forced physical disconnection (3). Our qualitative interviews and responses to the PRSF indicate that indeed both patients and relatives feel uncertain and lack of control, especially with regard to length of hospitalization which depends on the results of two negative COVID-19 tests. Patients and relatives report not only worries about their own health and well-being, but also worries about the well-being of family members and fear of infecting others. These findings may suggest that care for others and being able to stay connected are major issues in patients coping with the COVID 19 and their relatives.

We also found that only among relatives, anxiety was associated with a feeling of not being protected or taken care of by the hospital. This might be explained by the fact that relatives are not allowed to visit their hospitalized relative which may negatively affect their trust in the care provided to their loved ones, which further emphasizes the importance of taking care of COVID-19 patients' relatives.

The results of our regression analyses also indicate that the risk for anxiety is increased among females and is decreased among the ultra-orthodox. The higher levels of anxiety in women compared to men are consistent with the known increased life-time rates of anxiety disorders in women in the general population (16). It could also reflect the increased burden of

TABLE 2 | Factors associated with anxiety among adult patients and their adult relatives.

	Patients ($n = 68$)		**Adult relatives ($n = 66$)**	
	$R = 0.596$, Adj. $R^2 = 0.268$		**$R = 0.726$, Adj. $R^2 = 0.461$**	
	β (95% CI)	***P***	**β (95% CI)**	***P***
Age	−0.03 (−0.26 to 0.19)	0.753	0.00 (−0.28 to 0.29)	0.975
Female	0.36 (0.14 to 0.58)	0.001	0.47 (0.28 to 0.66)	<0.0001
Religiosity—Ultra-orthodox	−0.35 (−0.59 to −0.11)	0.004	−0.18 (−0.37 to 0.00)	0.061
Social disconnection	0.22 (−0.00 to 0.45)	0.050	0.13 (−0.06 to 0.34)	0.175
Feeling protected by hospital	−0.10 (−0.34 to 0.13)	0.372	−0.29 (−0.48 to −0.10)	0.003
Anxiety about infecting family members	0.13 (−0.09 to 0.36)	0.235	0.20 (−0.03 to 0.44)	0.092
Sleep problems	0.09 (−0.14 to 0.32)	0.431	0.10 (−0.14 to 0.34)	0.399
Financial concerns	0.14 (−0.08 to 0.36)	0.211	0.11 (−0.09 to 0.31)	0.262

caring for children and households during the pandemic and the fact that women are more vulnerable than men at times of economic instability (17).

The protective effect of being ultra-orthodox on anxiety, could be explained by the notion that the orthodox society is an extreme collectivistic culture, providing social support and feelings of belonging (18), thereby potentially reducing anxiety. There is also a stigma regarding mental health in the orthodox community, as having a mental illness could hamper the match-making process (19). Thus, orthodox individuals are more reluctant to share painful experiences. Interestingly, rates of COVID-19 infection among ultra-orthodox Jews in Israel and in New York City were very high (20, 21). Taken together, lower anxiety levels may partially explain the ultra-orthodox Jews being more vulnerable to contact COVID-19, since a certain degree of anxiety is needed for taking the precautions against getting infected.

The relatively low rates of depression found in our study corresponds with a temporary decrease in the rates of suicides following national crises (22). This is explained by the "pulling together effect" whereby individuals undergoing a shared experience support one another, thus strengthening social connectedness which could mitigate depression. Based on experience with previous national crises and prior pandemics (e.g., Ebola), it is likely that a degree of depressive symptoms will increase later on (23). We found that children reported significantly lower levels of anxiety than adult relatives. Referring to the classic distinction between objective and subjective burden among family caregivers (24), the lower distress among children may be due to the fact that while both adults and children face subjective burden (i.e., sadness and fear of contamination) adults face additional objective burden (i.e., financial difficulties).

This study has several limitations. First, its cross-sectional design limits conclusions about directionality. However, the fact that all participants were screened soon after hospitalization is a strength and will enable us to conduct a follow-up of this cohort. Second, although the acceptance rate to participate in the study was high, it is possible that patients and relatives who chose not to participate were more stressed. This may result in a selection bias affecting the internal validity and generalizability of results. If exists, this bias is especially important in regards to children and patients, whom participation rates were relatively lower. Third, we had no evaluation of the patients' anxiety and depression levels before hospitalization, therefore it is possible that they were already high due to the pandemic, regardless of their hospitalization. Fourth, we did not compare COVID-19 patients to patients with other acute hospitalizations, particularly medical illnesses that include social distancing from the patients' families. Thus, we cannot tell whether the high levels of anxiety are specific to COVID-19 patients and their relatives. Nevertheless, our results highlight the need to evaluate and address the anxiety of COVID-19 patients and their relatives. Forth, even if our findings are generalizable to Israeli patients and relatives, they may not be fully applicable to other countries.

In conclusion, our data suggest that patients and relatives experience similarly high levels of anxiety which is more robust in adult women and lower in ultra-orthodox participants. Future follow-up of the same population will enable us to identify risk and protective factors for the persistent and evolution of mental health consequences in patients with COVID-19 and their relatives.

DATA AVAILABILITY STATEMENT

The data that support our findings are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the study was approved by the Institutional Review Board of Sheba Medical Center, Tel Hashomer, Israel (IRS#SMC-7182-20). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors contributed to, reviewed, and approved the final manuscript. Conceiving and designing the study: SD-I, NH-P, AB-G, IH-O, RG, WC, AAb, and DG. Data collection: SD-I, NH-P, and NM. Statistical analyses: SD-I and NH-P. Qualitative analyses: AB-G and IH-O. Data interpretation:

SD-I, NH-P, AB-G, IH-O, RG, AAf, AZ, YK, IP, and DG. Writing the final manuscript: SD-I, NH-P, AB-G, IH-O, NM, and DG.

FUNDING

This study was supported by grants from Foundation Dora and the Binational Science Foundation (Grant No. 2017369) and Kirsh Foundation. The funding source had no role in the study design, collection, analysis, or interpretation of data, the writing of the article, or decision to submit the article for publication.

ACKNOWLEDGMENTS

We wish to thank Shira Bursztyn, Shachar Shani, Dana Basel, and Noy Meir for their assistance in interviewing the participants.

REFERENCES

1. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health.* (2020) 17:1729. doi: 10.3390/ijerph17051729
2. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to Coronavirus Disease 2019. *JAMA Netw open.* (2020) 3:e203976. doi: 10.1001/jamanetworkopen.2020.3976
3. Kent EE, Ornstein KA, Dionne-Odom JN. The family caregiving crisis meets an actual pandemic. *J Pain Symptom Manage.* (2020) 60:e66–e9. doi: 10.1016/j.jpainsymman.2020.04.006
4. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. *Brain Behav Immun.* (2020). doi: 10.1016/j.bbi.2020.05.048. [Epub ahead of print].
5. Grillon C, Lissek S, Rabin S, McDowell D, Dvir S, Pine DS. Increased anxiety during anticipation of unpredictable but not predictable aversive stimuli as a psychophysiologic marker of panic disorder. *Am J Psychiatry.* (2008) 165:898–904. doi: 10.1176/appi.ajp.2007.07101581
6. Montgomery RJ V, Gonyea JG, Hooyman NR. Caregiving and the experience of subjective and objective burden. *Fam Relat.* (1985) 34:19–26. doi: 10.2307/583753
7. Choi SW, Schalet B, Cook KF, Cella D. Establishing a common metric for depressive symptoms: linking the BDI-II, CES-D, and PHQ-9 to PROMIS depression. *Psychol Assess.* (2014) 26:513. doi: 10.1037/a0035768
8. Schalet BD, Cook KF, Choi SW, Cella D. Establishing a common metric for self-reported anxiety: linking the MASQ, PANAS, and GAD-7 to PROMIS Anxiety. *J Anxiety Disord.* (2014) 28:88–96. doi: 10.1016/j.janxdis.2013.11.006
9. Schalet BD, Pilkonis PA, Yu L, Dodds N, Johnston KL, Yount S, et al. Clinical validity of PROMIS Depression, Anxiety, and Anger across diverse clinical samples. *J Clin Epidemiol.* (2016) 73:119–27. doi: 10.1016/j.jclinepi.2015.08.036
10. Yardeni M, Abebe Campino G, Bursztyn S, Shamir A, Mekori-Domachevsky E, Toren A, et al. A three-tier process for screening depression and anxiety among children and adolescents with cancer. *Psychooncology.* (2020). doi: 10.1002/pon.5494. [Epub ahead of print].
11. Mosheva M, Hertz-Palmor N, Dorman Ilan S, Matalon N, Pessach IM, Afek A, et al. Anxiety, pandemic-related stress and resilience among physicians during the COVID-19 pandemic. *Depress Anxiety.* (2020). doi: 10.1002/da.23085. [Epub ahead of print].
12. Imai H, Matsuishi K, Ito A, Mouri K, Kitamura N, Akimoto K, et al. Factors associated with motivation and hesitation to work among health professionals during a public crisis: a cross sectional study of hospital workers in Japan during the pandemic (H1N1) 2009. *BMC Public Health.* (2010) 10:672. doi: 10.1186/1471-2458-10-672
13. Strauss A, Corbin J. Grounded theory methodology. *Handb Qual Res.* (1994) 17:273–85.
14. PROMIS® Scoring Manuals. Available online at: https://www.healthmeasures.net/promis-scoring-manuals.
15. Schulz R, Sherwood PR. Physical and mental health effects of family caregiving. *J Soc Work Educ.* (2008) 44:105–13. doi: 10.5175/JSWE.2008.773247702
16. Altemus M, Sarvaiya N, Epperson CN. Sex differences in anxiety and depression clinical perspectives. *Front Neuroendocrinol.* (2014) 35:320–30. doi: 10.1016/j.yfrne.2014.05.004
17. Norman J. *Gender and Covid-19: The Immediate Impact the Crisis is having on Women*. British Policy Politics LSE (2020).
18. Freund A, Band-Winterstein T. Cultural psychiatry: a spotlight on the experience of clinical social workers' encounter with Jewish ultra-orthodox mental health clients. *Community Ment Health J.* (2017) 53:613–25. doi: 10.1007/s10597-016-0056-9
19. Sartorius N, Schulze H. *Reducing the Stigma of Mental Illness: A Report from a Global Association.* New York, NY: Cambridge University Press (2005).
20. Halbfinger DM. *Virus Soars Among Ultra-Orthodox Jews as Many Flout Israel's Rules.* New York Times (2020).
21. Stack L, Schweber N. *Coronavirus: 'Huge Spike' in Brooklyn Hasidic Community.* New York Times (2020).
22. Joiner TE Jr, Hollar D, Orden K Van. On Buckeyes, Gators, Super Bowl Sunday, and the Miracle on Ice: "Pulling together" is associated with lower suicide rates. *J Soc Clin Psychol.* (2006) 25:179–95. doi: 10.1521/jscp.2006.25.2.179
23. Keita MM, Taverne B, Savané SS, March L, Doukoure M, Sow MS, et al. Depressive symptoms among survivors of Ebola virus disease in Conakry (Guinea): preliminary results of the PostEboGui cohort. *BMC Psychiatry.* (2017) 17:127. doi: 10.1186/s12888-017-1280-8
24. Hoenig J, Hamilton MW. The schizophrenic patient in the community and his effect on the household. *Int J Soc Psychiatry.* (1966) 12:165–76. doi: 10.1177/002076406601200301

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 12 November 2020
doi: 10.3389/fpsyt.2020.579057

Exploring the Representation of Depressive Symptoms and the Influence of Stigma in Arabic-Speaking Refugee Outpatients

*Nico Lindheimer, Carine Karnouk, Eric Hahn, Dana Churbaji, Laura Schilz, Diana Rayes, Malek Bajbouj and Kerem Böge**

Department of Psychiatry and Psychotherapy, Campus Benjamin Franklin, Charité - Universitätsmedizin, Berlin, Germany

OPEN ACCESS

Edited by:
Marinos Kyriakopoulos,
King's College London,
United Kingdom

Reviewed by:
Ali Abbas Samaha,
Lebanese International
University, Lebanon
Afia Ali,
University College London,
United Kingdom
Shaheen Zinna,
South London and Maudsley NHS
Foundation Trust, United Kingdom

Correspondence:
Kerem Böge
kerem.boege@charite.de

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *01 July 2020*
Accepted: *12 October 2020*
Published: *12 November 2020*

Citation:
Lindheimer N, Karnouk C, Hahn E,
Churbaji D, Schilz L, Rayes D,
Bajbouj M and Böge K (2020)
Exploring the Representation of
Depressive Symptoms and the
Influence of Stigma in
Arabic-Speaking Refugee Outpatients.
Front. Psychiatry 11:579057.
doi: 10.3389/fpsyt.2020.579057

The number of distressed refugees from the Arab world is relatively high in Germany and other host countries worldwide. For this specific population, substantial challenges and barriers have already been identified that hamper access to Germany's health care system. This study aims to contribute to this line of research by exploring the representation of depressive symptoms, both somatic and psychological, in order to inform clinicians about the most prevalent symptoms reported by Arabic-speaking refugee outpatients. Furthermore, this paper investigates the longstanding claim that mental health stigma fosters the expression of bodily distress. For these purposes, a total of 100 Arabic-speaking refugee outpatients, mostly Syrians, were recruited in Berlin, Germany. Somatic and psychological symptoms were assessed with the Patient Health Questionnaire (PHQ) 15 and 9, while stigma was assessed with the Brief Version of the Internalized Stigma of Mental Illness Scale (ISMI-10). Study results show that both somatic and psychological symptom severity was moderate while sleeping problems and energy loss were the most reported symptoms across both scales. Stigma was low and showed no association with somatic complaints in a multiple regression analysis, but was associated with more psychological symptoms. A principal factor extraction on the PHQ-15 items revealed five independent, somatic symptom clusters that were interpreted considering the rich poetic resources of the Arabic language. In conclusion, both somatic and psychological symptoms were commonly reported by Arabic-speaking refugees with symptoms of depression. Whereas, stigma does not seem to influence the expression of somatic symptoms, the present results provide first empirical indications for the relationship of symptom expression with the use of explanatory models and conceptualizations of mental illness within the Arabic culture and language. Future research efforts should be dedicated to enhancing our understanding of mental health care needs in this population as well as to exploring other mediators that might help explain the varying degree of somatic symptoms in depression across cultures.

Keywords: refugee, Arabic, depression, somatic, stigma

INTRODUCTION

In recent years, the number of individuals who have been forcibly displaced as a consequence of persecution, conflict, and violence around the world has risen to nearly 70 million. This number accounts for the highest total ever recorded by the United Nations High Commissioner for Refugees (1). As a result, more than 1.6 million asylum requests have been registered by the German Federal Office for Migration and Refugees (BAMF) since 2015, making Germany one of the most important host countries for refugees in the world (2, 3). In 2018, most refugees arrived from Syria (27.1%), followed by Iraq (10.0%), Nigeria (6.4%), Iran (6.3%), Turkey (6.3%), and Afghanistan (6.3%) (3). According to a representative survey of over 2,000 refugees in Germany, the main causes of flight include violent conflicts, war, prosecution, and impressment (4). Since Arabic-speaking countries currently constitute the largest number of displaced people, Arabic is considered by far the most frequently spoken native language within the refugee population in Germany (4, 5).

Exposure to traumatic events before and during migration, coupled with stressful experiences in the host environment, have been found to cause increased rates of psychological distress among refugee populations (6–9). Nonetheless, reliable epidemiological studies investigating the prevalence and course of mental illness in Germany's refugee population remain scarce (6, 10). Available tentative data, from rather small refugee samples, indicate that prevalence rates for any psychiatric disorder range between 30.5 and 95% (11–15). A recent meta-analysis estimates that the prevalence for depression in non-help-seeking Arabic-speaking refugees in Germany is 38% (95%-CI: 27–50%) and 29% (95%-CI: 21–37%) for symptoms of a post-traumatic stress disorder (PTSD) (Hoell, under review).

In light of the high need for psychiatric and psychotherapeutic treatment in this population, it is striking that refugees rarely have access to adequate and effective treatment services (16). As a contributing factor, multiple barriers seem to exist that hamper access to the German health care system for refugees and asylum seekers (10, 17). These comprise of institutional and structural barriers, such as restrictions through the Asylum-Seeker's Benefits Act and the lack of multilingual clinicians, as well as individual barriers, including lack of knowledge and language skills, shame, social, and cultural barriers (10, 17, 18). Moreover, it might be necessary to investigate whether and how experiences of trauma, war, and forced migration, coupled with a shared cultural background, translate into specific symptom representations and dysfunctions that contribute to misdiagnosis and delays in efficient and effective treatment in this population (19, 20).

Research on cultural differences in psychopathology has long focused on somatization in non-Western cultures, which can be defined as a process by which psychological distress is expressed in somatic terms (21). However, this line of research has often been driven by Western, rather stereotypical perspectives on culture, coupled with a tendency to equate culture with an ethnocultural group or merely using country of origin as a proxy (21, 22). Thus, calls for research practices that take on a more nuanced view and thereby identify the influences of specific cultural contexts and processes on psychopathology have recently raised (21). Such more sophisticated approaches have contributed to a more profound understanding of somatic symptoms in depression in cross-cultural research: In general, somatic symptoms can be considered a universal phenomenon in depressed individuals across cultures (23). Moreover, an epidemiological study with Chinese individuals in Hong Kong has shown that somatic and depressive symptoms seem to be positively correlated, which contradicts the notion that somatic symptoms are merely an immature expression of emotional distress (24). Still, an abundance of literature has found differences in the phenomenology of somatic symptoms in depression across cultural groups (19). As one potential mediator, Ma-Kellams has identified differences in somatic awareness and interoceptive accuracy across cultures and was able to link these to variations in the expression of somatic symptoms in psychopathology (25). Similarly, Ryder and colleagues showed that the relationship between culture and the presence of somatic symptoms was mediated by a tendency toward eternally oriented thinking (26). In conclusion, Kirmayer and Ryder argue that differences in the bodily expression of distress across cultures may be linked to culturally mediated modes of symptom interpretation which may be the result of stigma and available sources of help (21).

The notion that stigma might foster somatic symptom expression has often been suggested in the literature as an explanation for the observed cross-cultural variations [e.g., (21, 27)]. In general terms, mental health stigma can be understood as the negative stereotyping, biases, and discrimination faced by people with mental illness which negatively impacts the lives of affected persons in various ways (28). However, empirical evidence to support these claims is scarce and rather contradictory. Whereas, Wang et al. (29) and Rao et al. (30) found a significant association between stigma and somatization in a sample of Chinese undergraduate students and South Indian psychiatric inpatients, neither Heredia Montesinos et al. (31) nor Raguram et al. (32) found such an association in Turkish migrants or South Indian psychiatric outpatients, respectively.

In the literature on Arab mental health, various sources have suspected a causal relationship between mental health stigma and somatic symptoms (33–35). For instance, Al-Krenawi and Graham (34) attribute somatic symptom expression to a higher social acceptability of physical over psychological complaints in Arab cultures. In general, mental health stigma has been found to be highly prevalent in both Arab cultures and refugee populations (36–38). For instance, Dardas et al. (39) report that 88% of a representative sample of Jordanian adolescents have moderate to high stigma concerning depression. This in turn influences the help-seeking behavior for mental health issues, as individuals from Arab cultures fear bringing shame not only to themselves, but also to their families (40). Similarly, refugee adolescents from different countries have been shown to label mental health problems with a type of "craziness" that has to be hidden, because it negatively influences family reputation, social status and marriage prospects (41). As such, the population of Arabic-speaking refugees seems to be well-suited for the investigation of the relationship between stigma and the expression of somatic symptoms in depressed individuals.

Thus, the aim of the present study is to explore the representation of depressive symptoms in Arabic-speaking refugee outpatients. Furthermore, the prevalence of internalized mental health stigma will be assessed in order to investigate its relationship to the expression of psychological and somatic symptoms. Since various sources suspect that the bodily expression of distress is high in Arab cultures, *because* of prevalent mental health stigma (33–35), we test the hypothesis that internalized mental health stigma, which is the psychological impact of applying these negative societal stereotypes to oneself (42), is positively associated with the expression of somatic symptoms.

METHODS

Participants

For the current cross-sectional study, a convenience sample of 100 Arabic-speaking refugees was recruited via the MEHIRA (Mental Health in Refugees and Asylum Seeker) study (43) between October 2018 and October 2019 in Berlin, Germany. Five individuals were excluded due to missing questionnaires, resulting in a total sample size of $N = 95$. An a priori power analysis indicated that a total sample size of $N = 68$ is required for the detection of a moderate effect ($f^2 = 0.15$), with two predictors and a power of 80%, given an alpha error of 5%. Recruitment sites included the *Clearingstelle*, an outpatient facility for refugees in Berlin, and a psychiatric outpatient facility specialized in Arabic-speaking patients in Berlin, both established by the Charité Universitätsmedizin Berlin, Germany.

Inclusion criteria were defined as the following: (1) individuals between 18 and 65 years; (2) native Arabic speakers; (3) status of a refugee or asylum seeker which is defined according to the UNHCR as individuals who have been forced to flee their home country due to war, violence, or persecution (refugee) or as individuals who have requested sanctuary in another country and have applied for recognized refugee status there after fleeing their country (asylum seeker); who (4) show relevant symptoms of depression, defined by scoring "several days" or higher on the PHQ-9 on at least five of the nine items.

The exclusion criteria were: (1) missing informed consent; and a (2) current risk of suicidality based on clinical judgement or a score of four or more on the Montgomery–Åsberg Depression Rating Scale (MADRS) item 10.

Procedure

Study participants were invited to take part in a baseline assessment, lasting ∼90 min. Questionnaires of this comprehensive test-battery included, amongst others, the Arabic versions of the PHQ-15, the PHQ-9, the HTQ, and the ISMI, as well as socio-demographic information. All questionnaires were self-administered, yet an Arabic speaking psychologist surveilled the procedure and assisted in cases of illiteracy or need for further support. The data was then pseudonymized and transferred to a spreadsheet using the Statistical Package for the Social Sciences (SPSS) 22 for Windows (44). Since the study was conducted as a supplement to the MEHIRA study, it was covered and approved by the respective ethics vote issued from the ethics committee of the Charité – Universitätsmedizin Berlin (EA2/070/17).

Questionnaires

Patient Health Questionnaire-15 (PHQ-15)

The PHQ-15 (45) is a brief and widely used self-administered screening instrument for the expression of somatic symptoms. Its 15 items cover over 90% of the physical symptoms seen in primary care, such as stomach/back pain and/or headaches, excluding upper respiratory tract symptoms. Participants indicate on a three-point Likert scale, how much they had been bothered by the respective symptom in the past 4 weeks, ranging from "not bothered at all" (0) to "bothered a lot" (2). Symptom severity can be classified according to a sum score, ranging from 0 to 30, while scores of ≥ 5, ≥ 10, ≥ 15 represent mild, moderate, and severe levels, respectively. The PHQ-15 has been proven to be highly reliable and valid in both clinical and occupational settings (45–48). Furthermore, it has been previously applied to screen for somatic symptoms across cultures and in refugee populations (49, 50). According to a review of 40 scales for the assessment of self-reported somatic symptoms, the PHQ-15 can be considered the best option for large-scale studies and cross-cultural comparisons based on several criteria including psychometric criteria, type of symptoms, time frame, languages, and patient burden (51). An Arabic translation of the PHQ-15 has been demonstrated to be both valid and highly reliable in a sample of Saudi University students, with a Cronbach's α of 0.83 (52). For the current study, Cronbach's α was 0.82.

Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 (53) is a self-administered diagnostic screening instrument for the assessment and monitoring of depression severity in primary care. The nine items of the scale assess each of the Diagnostic Criterion A symptoms for a Major Depressive Episode according to the DSM-IV (54). Participants indicate the degree to which they had been bothered by the respective symptom in the past 2 weeks on a four-point Likert scale, ranging from "not at all" (0) to "nearly every day" (3). The PHQ-9 sum-score can be divided into the following five categories of increasing symptom severity: minimal (2–9), mild (10–14), moderate (15–19), and severe (≥ 20). Furthermore, a cutoff-score of ≥ 10 has been recommended for the detection of a current Major Depression Episode (55). Numerous studies have demonstrated the validity and reliability of the PHQ-9 in specific medical populations, in the general population and psychiatric samples (46, 56–58). Furthermore, cross-cultural measurement invariance has been demonstrated for both the PHQ-9 and the PHQ-15 in two studies comparing Germans and migrants, indicating their applicability for cross-cultural research (59, 60). Two studies have been conducted to assess the reliability and validity of an Arabic translation of the PHQ-9 in Saudi University students (52) and a Lebanese outpatient sample (61). Evidence for factorial, discriminant, and convergent validity was provided, and the reliability of the scale was found to be high ($0.86 \leq \alpha \leq 0.88$) (52, 61). In the present sample, Cronbach's α was 0.79.

The Brief Version of the Internalized Stigma of Mental Illness Scale (ISMI-10)

The ISMI-10 (62) is a brief, ten-item questionnaire for the assessment of internalized stigma of mental illness. In its original form, the ISMI comprises of 29 statements, measuring the five dimensions *alienation, discrimination experience, social withdrawal, stereotype endorsement*, and *stigma resistance* (63). The shortened version entails the two items of each subscale that demonstrated the strongest psychometric item qualities. Participants are asked to indicate their degree of agreement to a particular statement on a four-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (4). The ISMI mean score can be interpreted following a 4-category method [minimal to no internalized stigma (1.00–2.00); mild (2.01–2.50); moderate (2.51–3.00); severe internalized stigma (3.01–4.00)] (64), or according to a 2-category method [does not report high internalized stigma (1.00–2.50); reports high internalized stigma (2.51–4.00)] (65). Comparable psychometric properties have been found for the ISMI-10 and the 29-item version, in terms of validity and reliability (62). In further validation studies, the scale was found to be reliable ($0.75 \leq \alpha \leq 0.86$) and demonstrated predictive validity in relation to depression, physical health, self-esteem, functioning, recovery orientation, perceived devaluation and discrimination, empowerment, and quality of life (62, 66–68). To date, only the ISMI-29 has been translated into Arabic and validated within a refugee population (69). The Arabic version was shown to predict symptoms of depression, anxiety, and PTDS, and the reliability was found to be excellent ($\alpha = 0.94$). For the present study, the 10 items of the ISMI-10 were selected out of the Arabic translation of the ISMI-29. Cronbach's α of this version was 0.70 in the current sample.

The Harvard Trauma Questionnaire (HTQ)

The HTQ (70) is the most widely used screening instrument for the assessment of trauma-related symptoms among refugee populations worldwide (71, 72). Part four covers 40 items related to PTSD and refugee-specific expressions of functional distress (73). The first 16 items of this last part are derived from the DSM-IV criteria for PTSD and are used for the purposes of the present study. Participants are asked to indicate on a four-point Likert scale how much they had been bothered by a respective symptom, ranging from "not at all" (1) to "extremely" (4). Individuals can be considered symptomatic for PTSD according to the DSM-IV if their mean score reaches the cut-off of ≥ 2.5. Across a wide range of populations, this measure has been found to be reliable, and convergent validity has been demonstrated (74). An Arabic translation of the 16 item measure of the HTQ by Shoeb et al. (75) was found to be highly reliable in a sample of Syrian Kurdish refugees, with a Cronbach's α of 0.88 (76). Furthermore, the number of instances of torture and other traumatic events experienced were positively related to PTSD symptoms, underlining the HTQ's concurrent validity (76). In the present study, Cronbach's α was 0.89.

Statistical Analyses

All data was pseudonymized and stored in a password protected electronic spreadsheet. Statistical analyses were performed using the IBM Statistical Package for the Social Sciences (SPSS) 22 for Windows (44). Descriptive statistics were used to analyze the sample's socio-demographic characteristics (**Table 1**), as well as to provide an overview over the agreement to each individual item of the PHQ-15 and the PHQ-9 (**Tables 2**, **3**). Multiple regression analyses were conducted with the PHQ-15 score and PHQ-9 score as dependent variables, and the ISMI and the HTQ as predictors to test for associations of stigma with somatic and psychological symptoms, while controlling for trauma (**Table 4**). Finally, an explanatory factor analysis was performed on the PHQ-15 items using varimax rotation to identify culture-specific symptom clusters (**Table 5**). The alpha level of significance was set at 5%.

TABLE 1 | Sociodemographic characteristics of the survey sample.

Sociodemographic data	*N* = 95
Gender	
Male	54 (56.8%)
Female	41 (43.2%)
Age in years M ± SD 33.80 ± 9.69*	
19–30	44 (46.3%)
31–40	29 (30.5%)
41–50	15 (15.8%)
51–64	7 (7.4%)
Country of Origin	
Syria	75 (78.9%)
Iraq	12 (12.6%)
Palestine	4 (4.2%)
Kuwait	1 (1.1%)
Jordan	1 (1.1%)
Lebanon	1 (1.1%)
Libya	1 (1.1%)
Current state of residence	
Permanent residence permit	2 (2.1%)
Temporary residence permit	84 (88.4%)
No legal residence permit	9 (9.5%)
Education in years M ± SD 10.46 ± 2.99*	
0–5	6 (6.3%)
6–10	28 (39.5%)
11–15	57 (60.0%)
>15	4 (4.2%)

Mean and Standard Deviation.

RESULTS

For the present study, the data of 95 participants, 54 males and 41 females, with a mean age of 33.80 years (*SD* = 9.69; range 19–64), were analyzed. With over 78%, the majority of the refugees in the sample named Syria as their country of origin, followed by Iraq (12.6%) and Palestine (4.2%). Only a small percentage of 2.1% received a permanent residence status

TABLE 2 | Mean and standard deviation for each item of the PHQ-15 and the total scale.

PHQ-15	***M (SD)***
Total score (0–30)	**13.24 (5.58)**
Single items values	
1. Stomach pain	0.69 (0.76)
2. **Back pain**	**1.26(0.75)**
3. Pain in your arms, legs, or joints	1.25 (0.76)
4. Menstrual cramps or other problems with your period (women only, *N* = 38)	1.03 (0.79)
5. Pain or problems during sexual intercourse	0.29 (0.54)
6. Headaches	1.25 (0.73)
7. Chest pain	0.85 (0.71)
8. Dizziness	0.79 (0.74)
9. Fainting spells	0.14 (0.37)
10. Feeling your heart pound or race	1.02 (0.68)
11. Shortness of breath	0.97 (0.78)
12. Constipation, loose bowels, or diarrhea	0.74 (0.75)
13. Nausea, gas, or indigestion	0.65 (0.74)
14. **Feeling tired or having low energy**	**1.53 (0.70)**
15. **Trouble sleeping**	**1.44 (0.74)**

N = 95, the three items with the highest agreement are printed bold.

TABLE 3 | Mean and standard deviation for each item of the PHQ-9 and the total scale.

PHQ-9	***M (SD)***
Total score (0–27)	**16.28 (5.67)**
Single items values	
1. Little interest or pleasure in doing things	2.05 (0.92)
2. **Feeling down, depressed, or hopeless**	**2.18 (0.84)**
3. **Trouble falling or staying asleep, or sleeping too much**	**2.21 (1.01)**
4. **Feeling tired or having little energy**	**2.25 (0.89)**
5. Poor appetite or overeating	1.77 (1.17)
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	1.65 (1.11)
7. Trouble concentrating on things, such as reading the newspaper or watching television	1.99 (1.05)
8. Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	1.26 (1.18)
9. Thoughts that you would be better off dead or of hurting yourself in some way	0.92 (1.09)

N = 95, the three items with the highest agreement are printed bold.

TABLE 4 | Multiple regression analyses for the prediction of somatic and psychological symptoms by internalized stigma and the trauma.

	PHQ-15[a]			**PHQ-9**[b]		
Variable	***B***	***SE***	***β***	***B***	***SE***	***β***
ISMI	1.00	1.02	0.09	2.75	0.89	0.25*
HTQ	4.66	0.85	0.51**	5.08	0.72	0.57**
R^2	0.29			0.47		
F	18.00**			38.93**		

*[a]N = 91, [b]N = 92; **p ≤ 0.001, *p ≤ 0.01.*

from local authorities, whereas most individuals had a temporary residence status (88.4%), or even no legal residence permit (9.5%) to stay in Germany. On average, participants completed 10.46 years of schooling (*SD* = 2.99). Detailed information concerning all sociodemographic characteristics assessed is provided in **Table 1**. As such, the sociodemographic characteristics in terms of age and gender seem to be highly comparable to representative panel data of refugees living in Germany (77). In terms of education, a comparison is rather difficult due to the different types of assessment (years of education vs. international standard of education). Yet, the samples also seem comparable in this respect.

Symptom Representation

Descriptive analyses were performed for both the PHQ-15 and the PHQ-9 to explore the expression of depressive symptoms in the present sample. The results are depicted in **Table 2** for the PHQ-15 and **Table 3** for the PHQ-9. For the PHQ-15, the calculated mean score of 13.24 (*SD* = 5.58) indicates a moderate level of somatic symptoms. A detailed analysis on the item level revealed that the Arabic-speaking refugees in the sample were mostly bothered by *feeling tired or having low energy* (*M* = 1.53; *SD* = 0.70), followed by *trouble sleeping* (*M* = 1.44; *SD* = 0.74), and *back pain* (*M* = 1.26; *SD* = 0.75). For the PHQ-9, the mean score of 16.28 (*SD* = 5.67) is also indicative of a moderate level of psychological symptoms. Here, the symptoms that were experienced most frequently by the participants were *feeling tired or having little energy* (*M* = 2.25; *SD* = 0.89), followed by *trouble falling or staying asleep, or sleeping too much* (*M* = 2.21; *SD* = 1.01), and *feeling down, depressed, or hopeless* (*M* = 2.18; *SD* = 0.84). A correlation analysis revealed a moderately significant positive association between psychological and somatic symptoms ($r = 0.54$, $p < 0.001$).

Influence of Stigma on Symptom Representation

For the following analyses, three participants had to be excluded because they did not provide any answer to the ISMI scale. On average, participants displayed a rather low level of internalized stigma (*M* = 2.25; *SD* = 0.50), corresponding to *mild internalized stigma* according to the 4-category method, or to the category of *does not report high internalized stigma* according to the 2-category method (see above). The mean score of 2.58 (*SD* = 0.61) in the HTQ shows that, on average, individuals of the sample show relevant symptoms of PTSD according to the DSM-IV.

These two variables were entered as predictors into multiple regression analyses with the PHQ-15 and the PHQ-9 as dependent variables to test for associations of stigma with somatic and psychological symptoms while controlling for the

TABLE 5 | Explanatory factor analysis of the PHQ-15 items in Arabic-speaking refugees.

Item	**Factor loads**				
	1	**2**	**3**	**4**	**5**
Heart pound or race	**0.830**	0.028	0.057	0.123	−0.084
Shortness of breath	**0.784**	0.112	0.169	0.193	−0.117
Dizziness	**0.709**	0.236	−0.015	0.054	0.044
Chest pain	**0.588**	0.181	0.325	0.061	0.075
Painful sexual intercourse	−0.002	**0.677**	0.128	0.087	0.001
Tired/low energy	0.385	**0.540**	−0.022	0.301	0.051
Fainting spells	0.382	**0.496**	−0.219	−0.159	−0.030
Pain in arms, legs, joints	0.375	**0.484**	0.213	0.227	0.003
Constipation/diarrhea	−0.073	−0.198	**0.826**	0.141	0.045
Headaches	0.357	0.319	**0.608**	0.054	−0.018
Back pain	0.279	0.382	**0.593**	−0.027	−0.011
Stomach pain	0.042	0.227	−0.020	**0.859**	−0.088
Nausea, gas, indigestion	0.379	−0.050	0.264	**0.724**	0.112
Menstrual cramps	0.045	0.287	0.192	0.112	**0.826**
Trouble sleeping	0.145	0.381	0.195	0.161	**−0.738**
Eigenvalues	4.57	1.51	1.22	1.12	1.06
% of variance	30.48	10.07	8.16	7.49	7.09
α	0.78	0.56	0.55	0.68	−0.56

The table shows the five extracted factors after principal factor extraction and varimax rotation with their initial eigenvalues, the percentage of explained variance and internal consistency by Arabic-speaking refugees. Factor loads of individual items >0.4 are printed bold. By logical grouping factors were defined as following: (1) symptoms of sadness, (2) pain-induced fatigue, (3) head-body related symptoms, (4) indigestion, and (5) male sleep problems.

well-established association of trauma and the expression of somatic symptoms (78) (**Table 4**). For the regression model with the PHQ-15 as the dependent variable, one further participant had to be excluded, since his/her studentized deleted residual of 3.19 was classified as an outlier. No participant was excluded following a regression diagnostics procedure for the model with the PHQ-9 as a dependent variable.

For the PHQ-15, results revealed that the HTQ was the only significant predictor for the PHQ-15 score ($\beta = 0.51$, $p < 0.001$), whereas the ISMI did not reach statistical significance ($\beta = 0.09$, $p = 0.16$). In total, this model could explain 29% of the variance in the PHQ-15 score ($F_{(2,88)} = 18.00$, $p < 0.001$). For the PHQ-9, significant positive associations were found with both the ISMI ($\beta = 0.25$, $p = 0.002$) and the HTQ ($\beta = 0.57$, $p < 0.001$). Together, these two predictors accounted for 47% of the variance in the PHQ-9 score ($F_{(2,89)} = 38.93$, $p < 0.001$). These results do not support the postulated hypothesis that internalized stigma is associated with more somatic symptom expression.

Factor Structure of the PHQ-15 in a Sample of Arabic Speaking Refugees

Furthermore, the factor structure of all PHQ-15 items was examined in the present sample. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.724, which is above the recommended value of 0.5. Bartlett's test of sphericity was significant ($\chi^2(105) = 334.36$, $p < 0.001$). A principal factor extraction was performed using varimax rotation. The rotated factor matrix is depicted in **Table 5**. In this way, five distinct factors could be identified and were labeled with the help of an Arabic psychologist: (1) symptoms of sadness, (2) pain-induced fatigue, (3) head-body-related symptoms, (4) indigestion, and (5) male sleep problems.

Missing Values

Lastly, a close inspection of missing values was conducted to identify any regularities. Generally, missing values were rare and occurred only in two items of the PHQ-15: The item *Menstrual cramps or other problems with your period* was not answered by three (female) participants, and the item *Pain or problems during sexual intercourse* was left unanswered by 16 participants. Of the latter ones, 14 participants identified as male.

DISCUSSION

The present study aimed to explore the representation of depressive symptoms in a sample of Arabic-speaking refugee outpatients. Specifically, the expression of psychological and somatic distress was analyzed to inform clinicians about the most prevalent symptoms occurring within the largest refugee population in Germany. Furthermore, the prevalence of internalized stigma was examined to empirically investigate the supposed relationship between stigma and somatic symptom expression. The main results of this research show that Arabic-speaking refugee outpatients express a moderate level of both somatic and psychological symptoms of depression, and that stigma does not seem to be associated with somatic symptoms, but rather with psychological symptoms.

The present findings add empirical evidence from a rather under-researched population to the debate about somatization and psychologization across cultures. The moderate level of somatic symptoms expressed supports clinical observational data, which have reported a high level of bodily distress in Arab mental health patients and refugees (34, 79). This is even substantiated by an in-depth analysis of single items of the PHQ-9 which shows that the most prevalent psychological symptoms were the ones that were shared and overlap with the PHQ-15, namely a "feeling of energy loss" and "sleep disturbances." Therefore, these key depressive symptoms can be considered at least quasi-somatic, which highlights the role of somatic symptoms in Arabic-speaking refugees. Nevertheless, the rate of psychological depressive symptoms was also found to be substantial, and a moderately positive correlation was found between psychological and somatic symptoms. Even when the two overlapping items were deleted from both scales, the strength of the relationship still approached a significant, moderately positive level of association ($r = 0.46$, $p < 0.001$). As such, these findings are in line with the ones obtained by Lee et al. (24), who found that psychological and somatic distress coexisted in their Chinese population-based sample. Therefore, this study can be understood as another challenge for the Western mind-body dualism, as it shows that the experience of somatic distress does not preclude the simultaneous experience of psychological symptoms (26, 80).

The high prevalence of sleep problems mirrored in both the PHQ-9 and the PHQ-15 is not surprising, given that they are considered a core symptom of both depression and PTSD (81). As such, these findings are consistent with those by Sandahl et al. (82), who report that about 99% of their sample of 752 traumatized refugees reported having trouble sleeping and recurrent nightmares. Furthermore, a growing body of research shows that sleep disturbances in the context of depression have been linked to an increased risk of adverse health outcomes, including, functional impairment, an increased risk for suicidality, non-remittance, as well as decrements in mobility, self-care, cognition, pain, and interpersonal activities [for an overview see Stickley et al. (83)]. Thus, these findings have important implications for clinicians working with Arabic-speaking refugees, since interventions to improve sleep quality might have the potential to alleviate their psychological distress (81). A recently published manual for group therapy sessions with refugees can serve as a valuable source in this respect (84).

A further goal of the present research was the investigation of potential associations of internalized stigma with the representation of depressive symptoms. Contrary to the postulated hypothesis, our results show no association between stigma and somatic symptoms and thus provide no evidence for the supposed association between these constructs in the literature concerning Arab mental health (33–35). Moreover, these findings contribute to the open debate on the relation of stigma and the expression of bodily distress in cross-cultural research and substantiate evidence from previous research that did not find such associations (31, 32). However, stigma was found to be related to the severity of psychological symptoms when trauma symptoms were controlled. Various sources have reported similar findings, yet, due to the cross-sectional study design of this and previous studies, no causal relationship can be inferred (69, 85, 86). This highlights the need for further experimental studies that seek to lower stigma and investigate whether the depression severity level can be effectively reduced through such interventions.

Interestingly, the level of internalized stigma was relatively low in the present sample. This was unexpected, given that previous research has quite consistently demonstrated a high prevalence of mental health stigma in both Arab cultures and refugee populations (36–40). In a recent study, Karnouk et al. (87) report a similarly low level of stigma in psychiatric patients from the Jordanian host- and refugee community. As a possible explanation, the authors argue that this decrease might represent the effect of current efforts in the Arab world to meet the need for mental health care services and to raise public awareness of mental health issues (88). Alternatively, this low level of stigma might be the result of sampling bias. The current convenience sample comprised of treatment seeking individuals, who voluntarily participated in a study on refugee mental health care. As such, it is to be expected that these individuals generally have lower stigma concerning mental health issues compared to the ones who denied their participation or did not seek treatment at all. Moreover, the at least basic education level, as well as the rather young mean age of the sample, might have contributed to the low level of stigma observed (89, 90). In fact, a *post-hoc* correlation analysis revealed a positive association between age and stigma ($r = 0.27$, $p = 0.010$), yet, no association between years of schooling and stigma was found ($r = -0.10$, $p = 0.353$). However, given the restricted variance in the sociodemographic variables in the sample, these results are tentative at best and such analyses are recommend for future research with a more divers sample. Given that the demographic characteristics are similar to the ones obtained in by a representative panel study of refugees living in Germany (77), the present results concerning the low level of stigma might be transferable to the population of Arabic-speaking refugees in Germany, at least in this respect.

The explanatory approach for the identification of specific symptom clusters resulted in five independent factors that were named with the help of an Arabic psychologist: (1) symptoms of sadness, (2) pain-induced fatigue, (3) head-body related symptoms, (4) indigestion, and (5) male sleep problems. Three of these clusters have also been identified in a qualitative study with four focus groups within the Arab community in Dubai, who sought to identify the terms and descriptions that are commonly used for depressive symptoms (91). The first factor of symptoms of sadness is similar to the description of "[a] feeling of tightness or constriction in the chest [...where] the depressed person feels unable to take a deep breath [... because] the chest is felt to be too tightly packed with an excess of unpleasant feelings [...]" (p. 216). The second factor of pain-induced fatigue is described as "[f]atigue due to generalized aches [... with] a subjective feeling of lack of body energy and soundness (ta'bana), the limbs suffering the most" (p. 216). It has to be noted that the high loading of the item painful sexual intercourse has to be interpreted with caution due to the observed missing values. Lastly, the fourth factor of indigestion resembles the cluster of "[a]limentary symptoms in the form of nausea or sickness and poor appetite, which are attributed to the abdomen and particularly to the liver (chabid)" (p. 216).

Whereas, these three factors provide empirical evidence for clusters that have been identified by previous qualitative research (91), the interpretation of the factors three and five seems to be less straightforward. With constipation or diarrhea, headaches, and back pain, factor three comprises somatic symptoms from very different locations in the body. According to Hassan et al. such pain sensations in different body parts including "[…] cramps in the guts, or pain in the stomach or in the head […]" (p. 23) have been found to be a typical expression of fatigue and general distress in war-affected Syrians, coupled with a perception that the organs are unable to contain the distress (92). Factor five combines the items menstrual cramps and trouble sleeping with inverse factor loadings. Since male individuals had a mean score of 0 on the item menstrual cramps, the inverse association was assumed to be indicative of a higher severity level of sleep problems in men than in women. A *t*-test supported this assumption ($t(72.22) = -2.24, p = 0.03$). This is interesting, given that females have been previously found to exhibit more sleep problems compared to men (93). Further studies are necessary to investigate whether this observation describes a pattern in Arabic-speaking refugees. Also, it is suggested to perform individual factor analyses on the PHQ-15 items for males and females in studies with larger sample sizes.

These symptom clusters highlight the reciprocal relationship of explanatory models of mental illness with language and culture. In Arabic, emotions are usually described with metaphors and imagery drawn from rich poetic cultural resources (34, 92, 94). Especially references to the heart seem common for the description of depressive symptoms and distress. Hassan et al. (92) have compiled a list of commonly used expressions and idioms for distress in Syrian Arabic on the basis of suggestions by various Arabic-speaking mental health professionals. Depressive symptoms are described by a feeling of "heaviness in the heart," "pain in the heart," or a "squeezed heart," or by phrases such as "blindness got to my heart" and "my heart is broken" (p. 23–26). Thus, it is not surprising that the first factor, comprising symptoms such as a pounding heart, shortness of breath, and chest pain, could explain the highest proportion of the variance in all somatic symptoms. A better understanding of such idioms might enhance a clinical conversation with Arabic-speaking mental health patients and could even inform interventions and treatment approaches (92).

The analysis of missing values revealed that specifically shame related items, including menstrual cramps and painful sexual intercourse, were occasionally left unanswered by participants. Especially males did not answer the item on sexual pain and some explained this with the absence of their wife. Even though this answer seems plausible, the pattern observed might additionally point to an often documented, still prevailing taboo of sexuality-related issues in the Arab world, as well as a lack of education on these matters (95, 96). Thus, the present findings might argue for special care and cultural awareness when talking about sexuality-related topics with Arabic-speaking refugees in research or health care settings. Therefore, it is recommended to match patients with clinicians or interviewers of the same sex, at least at the beginning of therapy, a procedure that could not always be assured in the present research concerning the surveilling psychologist due to limited resources (97).

A particular strength of the present study lies in the selection of measures for somatic and psychological symptoms of depression that have been explicitly recommended for cross-cultural research (51). This lays the foundation for the comparison of the given results with results from studies with refugee populations from other cultural backgrounds and thus satisfies a call by Rohlof et al. (79), who criticized that the abundance of different, often non-validated measures exacerbate a global understanding of bodily distress in refugees.

The present results have to be interpreted in light of several limitations: Firstly, concerning the sample recruited the selection bias has resulted in a convenience sample that might not be representative of the population of Arabic-speaking refugees with symptoms of depression, especially concerning the level of mental health stigma. Furthermore, the convenience sample consisted of refugees from mostly Syrian descent, which might impede the generalizability to Arabic-speaking refugees in general and should thus be considered in future research. However, since the vast majority of refugees worldwide as well as in Germany originate from Syria, the sample seems representative for the underlying population. It is also highly recommended to recruit a larger sample in future research in order to analyze how variables like gender or age moderate the associations observed. Secondly, depressive symptoms were merely assessed with the PHQ-9, since clinical diagnoses were not available for all participants. It is recommended to use standardized clinical interviews or expert diagnoses in further studies to specifically investigate symptoms of Arabic-speaking refugees with a diagnosis of depression. Likewise, information concerning comorbidities, medication, or other demographic variables like residence time in Germany could not be included here, but would be vital in future research. Thirdly, the use of self-report questionnaires might have resulted in common method variance, which might have increased the observed effects in the regression analyses. Yet, it has to be noted that self-report questionnaires might be especially appropriate for research in this population, since this method has been found to reduce a respondent's discomfort and embarrassment for sensitive issues and might thus result in more reliable data (98). Concerning the questionnaires used, it also has to be mentioned that the only the ISMI-29, but not the ISMI-10 used, has been validated in an Arabic-speaking refugee population and future research is encouraged to use validated questionnaires to minimize measurement bias. Fourthly, no comparison group was included from another cultural background. This would have been especially necessary for the analysis and interpretation of the symptom clusters found in order to infer culture-specific regularities. Therefore, the inclusion of comparison groups is highly recommended for further research. Lastly, it needs to be stressed that even though country of origin was not used as a proxy for culture, individuals from very different backgrounds were collapsed into the category of Arabic-speaking refugees for the purpose of the present study. As suggested by Kirmayer and Ryder (21), this grouping was based on specific cultural contexts and processes such as shared language background and experiences of flight, nevertheless, this leads to an impression of a rather homogenous group which is certainly not the case.

In conclusion this study provides empirical evidence that both somatic and psychological symptoms are commonly used forms of expressing depressive symptoms in Arabic-speaking refugees, while problems with sleep and energy loss seem to be the most prevalent symptoms reported. Although these results should be interpreted with caution, it does not appear that a higher level of somatic symptom expression can be traced back to mental health stigma, but rather to culture-specific explanatory models, idioms, and expressions. The implications that arise from these findings are that mental health professionals should be trained more thoroughly in both the special mental health needs of Arabic-speaking refugees as well as in culturally mediated modes of symptom interpretation and expression. Given that refugees in Germany seldomly receive adequate mental health treatment (10), learning about typical symptoms and cultural codes might help improve our understanding of a cultural barrier, i.e., the way of expressing depressive symptoms, and might eventually contribute to faster diagnosis and better mental health care provision for the largest refugee population in Germany.

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 human participants were reviewed and approved by Ethical Committee of Charité - Universitätsmedizin Berlin (EA2/070/17). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

NL contributed to the conceptualization of the idea, data analysis and interpretation, as well as to writing. CK contributed to scale selection, data collection logistics, interpretation of the data, and supervision. EH, MB, and KB contributed to the conceptualization of the idea and study design, revision, and supervision. DR, DC, and LS contributed to scale selection and translation, as well as to data collection logistics. All authors read and approved the final manuscript.

FUNDING

The MEHIRA study was funded by the Innovationsfond, Ministry of Health (01VSF16061).

ACKNOWLEDGMENTS

The authors thank Nadim Hendawi, Maram Bitar, and Sarah Mende for their assistance throughout the interview process and data collection.

REFERENCES

1. UNHCR. *Global Trends: Forced Displacement in 2017: United Nations Refugee Agency (UNHCR)*. (2018). Available online at: https://www.unhcr.org/globaltrends2017/ (accessed December 10, 2018).
2. UNHCR. *United Nations Refugee Agency (UNHCR) - Factsheet Germany Q1 2018: United Nations Refugee Agency (UNHCR)*. (2018). Available online at: https://www.unhcr.org/dach/wp-content/uploads/sites/27/2018/03/Factsheet_Germany_O1_2018.pdf (accessed December 10, 2018).
3. BAMF. *Bundesamt für Migration und Flüchtlinge (BAMF) - Aktuelle Zahlen zu Asyl (10/2018): Bundesamt für Migration und Flüchtlinge (BAMF)*. (2018). Available online at: www.bamf.de/SharedDocs/Anlagen/DE/Downloads/Infothek/Statistik/Asyl/aktuelle-zahlen-zu-asyl-oktober-2018.pdf?__blob=publicationFile (accessed December 10, 2018).
4. Romiti A, Brücker H, Fendel T, Kosyakova Y, Liebau E, Rother N, et al. Bildung und Sprache. In: Brücker H, Rother N, Schupp J, editors. *IAB-BAMF-SOEP-Befragung von Geflüchteten: Überblick und erste Ergebnisse*. (2016). p. 37–47.
5. Juran S, Broer PN. A profile of Germany's refugee populations. *Popul Dev Rev*. (2017) 43:149–57. doi: 10.1111/padr.12042
6. Bajbouj M, Alabdullah J, Ahmad S, Schidem S, Zellmann H, Schneider, et al. Psychosoziale Versorgung von Flüchtlingen in Deutschland. *Der Nervenarzt*. (2018) 89:1–7. doi: 10.1007/s00115-017-0326-y
7. Li SSY, Liddell BJ, Nickerson A. The relationship between post-migration stress and psychological disorders in refugees and asylum seekers. *Curr Psychiatry Rep*. (2016) 18:82. doi: 10.1007/s11920-016-0723-0
8. Euteneuer F, Schafer SJ. Brief Report: subjective social mobility and depressive symptoms in Syrian refugees to Germany. *J Immigr Minor Health*. (2018) 20:1533–6. doi: 10.1007/s10903-018-0692-y
9. Ullmann E, Barthel A, Taché S, Bornstein A, Licinio J, Bornstein SR. Emotional and psychological trauma in refugees arriving in Germany in 2015. *Mol Psychiatry*. (2015) 20:1483. doi: 10.1038/mp.2015.164
10. Schneider F, Heinz A, Bajbouj M. Psychische Versorgung von Flüchtlingen in Deutschland: Modell für ein gestuftes Vorgehen. *Der Nervenarzt*. (2017) 88:10–7. doi: 10.1007/s00115-016-0243-5
11. Belz M, Belz M, Ozkan I, Graef-Calliess IT. Posttraumatic stress disorder and comorbid depression among refugees: assessment of a sample from a German refugee reception center. *Transcult Psychiatry*. (2017) 54:595–610. doi: 10.1177/1363461517745473
12. Führer A, Eichner F, Stang A. Morbidity of asylum seekers in a medium-sized German city. *Eur J Epidemiol*. (2016) 31:703–6. doi: 10.1007/s10654-016-0148-4
13. Georgiadou E, Zbidat A, Schmitt GM, Erim Y. Prevalence of mental distress among Syrian refugees with residence permission in Germany: a Registry-Based Study. *Front Psychiatry*. (2018) 9:393. doi: 10.3389/fpsyt.2018.00393
14. Richter K, Peter L, Lehfeld H, Zäske H, Brar-Reissinger S, Niklewski G. Prevalence of psychiatric diagnoses in asylum seekers with follow-up. *BMC Psychiatry*. (2018) 18:206. doi: 10.1186/s12888-018-1783-y
15. Winkler JG, Brandl EJ, Bretz HJ, Heinz A, Schouler-Ocak M. Psychische Symptombelastung bei Asylsuchenden in Abhängigkeit vom Aufenthaltsstatus. *Psychiatrische Praxis*. (2019) 46:191–9. doi: 10.1055/a-0806-3568

16. Munz D, Melcop N. The psychotherapeutic care of refugees in Europe: treatment needs, delivery reality and recommendations for action. *Eur J Psychotraumatol*. (2018) 9:1476436. doi: 10.1080/20008198.2018.1476436
17. Schouler-Ocak M. Psychiatrische Versorgung von Menschen mit Migrationshintergrund in Deutschland. *Der Nervenarzt*. (2015) 86:1320–5. doi: 10.1007/s00115-015-4333-6
18. Borgschulte HS, Wiesmüller GA, Bunte A, Neuhann F. Health care provision for refugees in Germany – one-year evaluation of an outpatient clinic in an urban emergency accommodation. *BMC Health Serv Res*. (2018) 18:488. doi: 10.1186/s12913-018-3174-y
19. Bagayogo IP, Interian A, Escobar JI. Transcultural aspects of somatic symptoms in the context of depressive disorders. *Adv Psychosom Med*. (2013) 33:64–74. doi: 10.1159/000350057
20. Liang J, Matheson BE, Douglas JM. Mental health diagnostic considerations in racial/ethnic minority youth. *J Child Fam Stud*. (2016) 25:1926–40. doi: 10.1007/s10826-015-0351-z
21. Kirmayer LJ, Ryder AG. Culture and psychopathology. *Curr Opin Psychol*. (2016) 8:143–8. doi: 10.1016/j.copsyc.2015.10.020
22. Kirmayer LJ, Ban L. Cultural psychiatry: research strategies and future directions. *Adv Psychosom Med*. (2013) 33:97–114. doi: 10.1159/000348742
23. Kapfhammer H-P. Somatic symptoms in depression. *Dialogues Clin Neurosci*. (2006) 8:227–39.
24. Lee S, Leung CM, Kwok KP, Lam Ng K. A community-based study of the relationship between somatic and psychological distress in Hong Kong. *Transcult Psychiatry*. (2015) 52:594–615. doi: 10.1177/1363461515569756
25. Ma-Kellams C. Cross-cultural differences in somatic awareness and interoceptive accuracy: a review of the literature and directions for future research. *Front Psychol*. (2014) 5:1379. doi: 10.3389/fpsyg.2014.01379
26. Ryder AG, Yang J, Zhu X, Yao S, Yi J, Heine SJ, et al. The cultural shaping of depression: somatic symptoms in China, psychological symptoms in North America? *J Abnorm Psychol*. (2008) 117:300–13. doi: 10.1037/0021-843X.117.2.300
27. Zaroff CM, Davis JM, Chio PH, Madhavan D. Somatic presentations of distress in China. *Aust N Z J Psychiatry*. (2012) 46:1053–7. doi: 10.1177/0004867412450077
28. Hinshaw SP. *The Mark of Shame: Stigma of Mental Illness and an Agenda for Change*. New York, NY: Oxford University Press (2007).
29. Wang X, Peng S, Li H, Peng Y. How depression stigma affects attitude toward help seeking: the mediating effect of depression somatization. *Soc Behav Pers*. (2015) 43:945–53. doi: 10.2224/sbp.2015.43.6.945
30. Rao D, Young M, Raguram R. Culture, somatization, and psychological distress: symptom presentation in South Indian patients from a public psychiatric hospital. *Psychopathology*. (2007) 40:349–55. doi: 10.1159/000106312
31. Heredia Montesinos A, Rapp MA, Temur-Erman S, Heinz A, Hegerl U, Schouler-Ocak M. The influence of stigma on depression, overall psychological distress, and somatization among female Turkish migrants. *Eur Psychiatry*. (2012) 27:22–6. doi: 10.1016/S0924-9338(12)75704-8
32. Raguram R, Weiss MG, Channabasavanna SM, Devins GM. Stigma, depression, and somatization in South India. *Am J Psychiatry*. (1996) 153:1043–9. doi: 10.1176/ajp.153.8.1043
33. Al-Krenawi A. Mental health practice in Arab countries. *Curr Opin Psychiatry*. (2005) 18:560–4. doi: 10.1097/01.yco.0000179498.46182.8b
34. Al-Krenawi A, Graham JR. Culturally sensitive social work practice with Arab clients in mental health settings. *Health Soc Work*. (2000) 25:9–22. doi: 10.1093/hsw/25.1.9
35. Okasha A, Okasha T. Somatoform disorders - an Arab perspective. In: Ono Y, Janca A, Asai M, Sartorius N, editors. *Somatoform disorders—A worldwide perspective*. Minato: Springer Japan (1999). p. 38–46. doi: 10.1007/978-4-431-68500-5_5
36. Zolezzi M, Alamri M, Shaar S, Rainkie D. Stigma associated with mental illness and its treatment in the Arab culture: a systematic review. *Int J Soc Psychiatry*. (2018) 64:597–609. doi: 10.1177/0020764018789200
37. Saechao F, Sharrock S, Reicherter D, Livingston JD, Aylward A, Whisnant J. Stressors and barriers to using mental health services among diverse groups of first-generation immigrants to the United States. *Community Ment Health J*. (2012) 48:98–106. doi: 10.1007/s10597-011-9419-4
38. Morris MD, Popper ST, Rodwell TC, Brodine SK, Brouwer KC. Healthcare barriers of refugees post-resettlement. *J Community Health*. (2009) 34:529–38. doi: 10.1007/s10900-009-9175-3
39. Dardas LA, Silva SG, Smoski MJ, Noonan D, Simmons LA. Personal and perceived depression stigma among Arab adolescents: associations with depression severity and personal characteristics. *Arch Psych Nurs*. (2017) 31:499–506. doi: 10.1016/j.apnu.2017.06.005
40. Soheilian SS, Inman AG. Middle Eastern Americans: the effects of stigma on attitudes toward counseling. *J Muslim Ment Health*. (2009) 4:139–58. doi: 10.1080/15564900903245766
41. Anstiss H de, Ziaian T. Mental health help-seeking and refugee adolescents: qualitative findings from a mixed-methods investigation. *Aust Psychol*. (2010) 45:29–37. doi: 10.1080/00050060903262387
42. Corrigan PW. The impact of stigma on severe mental illness. *Cogn Behav Pract*. (1998) 5:201–22. doi: 10.1016/S1077-7229(98)80006-0
43. Böge K, Karnouk C, Hahn E, Schneider F, Habel U, Banaschewski T. Mental health in refugees and asylum seekers (MEHIRA): study design and methodology of a prospective multicentre randomized controlled trail investigating the effects of a stepped and collaborative care model. *Eur Arch Psychiatry Clin Neurosci*. (2019) 270:95–106. doi: 10.1007/s00406-019-00991-5
44. *IBM SPSS Statistics for Windows*. Armonk, NY: IBM Corp (2013).
45. Kroenke K, Spitzer RL, Williams JBW. The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms. *Psychosom Med*. (2002) 64:258–66. doi: 10.1097/00006842-200203000-00008
46. Kroenke K, Spitzer RL, Williams JBW, Löwe B. The Patient Health Questionnaire somatic, anxiety, and depressive symptom scales: a systematic review. *Gen Hosp Psychiatry*. (2010) 32:345–59. doi: 10.1016/j.genhosppsych.2010.03.006
47. Kocalevent R-D, Hinz A, Brähler E. Standardization of a screening instrument (PHQ-15) for somatization syndromes in the general population. *BMC Psychiatry*. (2013) 13:91. doi: 10.1186/1471-244X-13-91
48. Vroege L de, Hoedeman R, Nuyen J, Sijtsma K, van der Feltz-Cornelis CM. Validation of the PHQ-15 for somatoform disorder in the occupational health care setting. *J Occup Rehabil*. (2012) 22:51–8. doi: 10.1007/s10926-011-9320-6
49. Dreher A, Hahn E, Diefenbacher A, Nguyen MH, Böge K, Burian H. Cultural differences in symptom representation for depression and somatization measured by the PHQ between Vietnamese and German psychiatric outpatients. *J Psychosom Res*. (2017) 102:71–7. doi: 10.1016/j.jpsychores.2017.09.010
50. Hahn E, Burian R, Dreher A, Schomerus G, Dettling M, Diefenbacher A. Beurteilung depressiver und somatischer Symptome mittels des PHQ-9 und PHQ-15 bei ambulanten vietnamesischen und deutschen Patientinnen. *Zeitschrift für Psychiatrie, Psychologie und Psychotherapie*. (2016) 64:25–36. doi: 10.1024/1661-4747/a000257
51. Zijlema WL, Stolk RP, Löwe B, Rief W, White PD, Rosmalen JGM. How to assess common somatic symptoms in large-scale studies: a systematic review of questionnaires. *J Psychosom Res*. (2013) 74:459–68. doi: 10.1016/j.jpsychores.2013.03.093
52. AlHadi AN, AlAteeq DA, Al-Sharif E, Bawazeer HM, Alanazi H, AlShomrani AT, et al. An arabic translation, reliability, and validation of Patient Health Questionnaire in a Saudi sample. *Ann Gen Psychiatry*. (2017) 16:32. doi: 10.1186/s12991-017-0155-1
53. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: validity of a brief depression severity measure. *J Gen Int Med*. (2001) 16:606–13. doi: 10.1046/j.1525-1497.2001.016009606.x
54. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders, Fourth Edition, Text Revision (DSM-IV-TR)*. Arlington, VA: American Psychiatric Association (2000).
55. Kroenke K, Spitzer RL. The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric Annals*. (2002) 32:509–15. doi: 10.3928/0048-5713-20020901-06
56. Beard C, Hsu KJ, Rifkin LS, Busch AB, Björgvinsson T. Validation of the PHQ-9 in a psychiatric sample. *J Affect Disord*. (2016) 193:267–73. doi: 10.1016/j.jad.2015.12.075
57. Patrick S, Connick P. Psychometric properties of the PHQ-9 depression scale in people with multiple sclerosis: a systematic review. *bioRxiv*. (2018) 2018:321653. doi: 10.1101/321653

58. Kiely KM, Butterworth P. Validation of four measures of mental health against depression and generalized anxiety in a community based sample. *Psychiatry Res*. (2015) 225:291–8. doi: 10.1016/j.psychres.2014.12.023
59. Mewes R, Christ O, Rief W, Brähler E, Martin A, Glaesmer H. Sind Vergleiche im Depressions- und Somatisierungsausmaß zwischen Migranten und Deutschen möglich? *Diagnostica*. (2010) 56:230–9. doi: 10.1026/0012-1924/a000026
60. Reich H, Rief W, Brähler E, Mewes R. Cross-cultural validation of the German and Turkish versions of the PHQ-9: an IRT approach. *BMC Psychol*. (2018) 6:26. doi: 10.1186/s40359-018-0238-z
61. Sawaya H, Atoui M, Hamadeh A, Zeinoun P, Nahas Z. Adaptation and initial validation of the Patient Health Questionnaire - 9 (PHQ-9) and the Generalized Anxiety Disorder - 7 Questionnaire (GAD-7) in an Arabic speaking Lebanese psychiatric outpatient sample. *Psychiatry Res*. (2016) 239:245–52. doi: 10.1016/j.psychres.2016.03.030
62. Boyd JE, Otilingam PG, Deforge BR. Brief version of the Internalized Stigma of Mental Illness (ISMI) scale: psychometric properties and relationship to depression, self esteem, recovery orientation, empowerment, and perceived devaluation and discrimination. *Psychiatr Rehabil J*. (2014) 37:17–23. doi: 10.1037/prj0000035
63. Ritsher JB, Otilingam PG, Grajales M. Internalized stigma of mental illness: psychometric properties of a new measure. *Psychiatry Res*. (2003) 121:31–49. doi: 10.1016/j.psychres.2003.08.008
64. Lysaker PH, Roe D, Yanos PT. Toward understanding the insight paradox: internalized stigma moderates the association between insight and social functioning, hope, and self-esteem among people with schizophrenia spectrum disorders. *Schizophrenia Bulletin*. (2007) 33:192–9. doi: 10.1093/schbul/sbl016
65. Ritsher (Boyd) J, Phelan JC. Internalized stigma predicts erosion of morale among psychiatric outpatients. *Psychiatry Res*. (2004) 129:257–65. doi: 10.1016/j.psychres.2004.08.003
66. Pearl RL, Forgeard MJC, Rifkin L, Beard C, Björgvinsson T. Internalized stigma of mental illness: changes and associations with treatment outcomes. *Stigma Health*. (2017) 2:2–15. doi: 10.1037/sah0000036
67. Hammer JH, Toland MD. Internal structure and reliability of the Internalized Stigma of Mental Illness Scale (ISMI-29) and Brief Versions (ISMI-10, ISMI-9) among Americans with depression. *Stigma Health*. (2017) 2:159–74. doi: 10.1037/sah0000049
68. Ociskova M, Prasko J, Kamaradova D, Marackova M, Holubova M. Evaluation of the psychometric properties of the brief Internalized Stigma of Mental Illness Scale (ISMI-10). *Neuro Endocrinol Lett*. (2016) 37:511–7.
69. Kira IA, Ramaswamy V, Lewandowski L, Mohanesh J, Abdul-Khalek H. Psychometric assessment of the Arabic version of the Internalized Stigma of Mental Illness (ISMI) measure in a refugee population. *Transcult Psychiatry*. (2015) 52:636–58. doi: 10.1177/1363461515569755
70. Mollica RF, Caspi-Yavin Y, Bollini P, Truong T, Tor S, Lavelle J. The Harvard Trauma Questionnaire. Validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. *J Nerv Men Dis*. (1992) 180:111–6. doi: 10.1097/00005053-199202000-00008
71. Sigvardsdotter E, Malm A, Tinghög P, Vaez M, Saboonchi F. Refugee trauma measurement: a review of existing checklists. *Public Health Rev*. (2016) 37:10. doi: 10.1186/s40985-016-0024-5
72. Morina N, Akhtar A, Barth J, Schnyder U. Psychiatric disorders in refugees and internally displaced persons after forced displacement: a systematic review. *Front Psychiatry*. (2018) 9:433. doi: 10.3389/fpsyt.2018.00433
73. Berthold SM, Mollica RF, Silove D, Tay AK, Lavelle J, Lindert J. The HTQ-5: revision of the Harvard Trauma Questionnaire for measuring torture, trauma and DSM-5 PTSD symptoms in refugee populations. *Eur J Public Health*. (2018) 29:468–74. doi: 10.1093/eurpub/cky256
74. Darzi C. *The Harvard Trauma Questionnaire: Reliability and Validity Generalization Studies of the Symptom Scales*. Ottawa: Université d'Ottawa/University of Ottawa (2017).
75. Shoeb M, Weinstein H, Mollica R. The Harvard trauma questionnaire: adapting a cross-cultural instrument for measuring torture, trauma and posttraumatic stress disorder in Iraqi refugees. *Int J Soc Psychiatry*. (2007) 53:447–63. doi: 10.1177/0020764007078362
76. Ibrahim H, Hassan CQ. Post-traumatic stress disorder symptoms resulting from torture and other traumatic events among Syrian Kurdish refugees in Kurdistan region, Iraq. *Front Psychol*. (2017) 8:241. doi: 10.3389/fpsyg.2017.00241
77. Walther L, Fuchs LM, Schupp J, von Scheve C. Living conditions and the mental health and well-being of refugees: evidence from a large-scale German survey. In: *SOEPpapers on Multidisciplinary Panel Data Research 1029*. Berlin: DIW (2019).
78. Morina N, Kuenburg A, Schnyder U, Bryant RA, Nickerson A, Schick M. The Association of post-traumatic and postmigration stress with pain and other somatic symptoms: An explorative analysis in traumatized refugees and asylum seekers. *Pain Medicine*. (2018) 19:50–9. doi: 10.1093/pm/pnx005
79. Rohlof HG, Knipscheer JW, Kleber RJ. Somatization in refugees: a review. *Soc Psychiatry Psychiatr Epidemiol*. (2014) 49:1793–804. doi: 10.1007/s00127-014-0877-1
80. So JK. Somatization as cultural idiom of distress: rethinking mind and body in a multicultural society. *Couns Psychol Q*. (2008) 21:167–74. doi: 10.1080/09515070802066854
81. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (5th Edition)*. Washington, DC: Author (2013). doi: 10.1176/appi.books.9780890425596
82. Sandahl H, Vindbjerg E, Carlsson J. Treatment of sleep disturbances in refugees suffering from post-traumatic stress disorder. *Transcult Psychiatry*. (2017) 54:806–23. doi: 10.1177/1363461517746314
83. Stickley A, Leinsalu M, DeVylder JE, Inoue Y, Koyanagi A. Sleep problems and depression among 237 023 community-dwelling adults in 46 low- and middle-income countries. *Sci Rep*. (2019) 9:1–10. doi: 10.1038/s41598-019-48334-7
84. Wiechers M, Übleis A, Padberg F. *Empowerment für Menschen mit affektiven Erkrankungen und Migrationserfahrungen: Therapiemanual für Einzel- und Gruppensettings*. Stuttgart: Schattauer (2019).
85. Kulesza M, Raguram R, Rao D. Perceived mental health related stigma, gender, and depressive symptom severity in a psychiatric facility in South India. *Asian J Psychiatr*. (2014) 9:73–7. doi: 10.1016/j.ajp.2014.03.005
86. Pyne JM, Kuc EJ, Schroeder PJ, Fortney JC, Edlund M, Sullivan G. Relationship between perceived stigma and depression severity. *J Nerv Ment Dis*. (2004) 192:278–83. doi: 10.1097/01.nmd.0000120886.39886.a3
87. Karnouk C, Böge K, Hahn E, Strasser J, Schweininger S, Bajbouj M. Psychotherapy in Jordan: an investigation of the host and Syrian refugee community's perspectives. *Front Psychiatry*. (2019) 10:556. doi: 10.3389/fpsyt.2019.00556
88. Sewilam AM, Watson AMM, Kassem AM, Clifton S, McDonald MC, Lipski R, et al. Roadmap to reduce the stigma of mental illness in the Middle East. *Int J Soc Psychiatry*. (2015) 61:111–20. doi: 10.1177/0020764014537234
89. Wang J, Fick G, Adair C, Lai D. Gender specific correlates of stigma toward depression in a Canadian general population sample. *J Affect Disord*. (2007) 103:91–7. doi: 10.1016/j.jad.2007.01.010
90. Cook TM, Wang J. Descriptive epidemiology of stigma against depression in a general population sample in Alberta. *BMC Psychiatry*. (2010) 10:1–11. doi: 10.1186/1471-244X-10-29
91. Sulaiman SOY, Bhugra D, de Silva P. Perceptions of depression in a community sample in Dubai. *Transcult Psychiatry*. (2001) 38:201–18. doi: 10.1177/136346150103800204
92. Hassan G, Kirmayer LJ, Mekki-Berrada A, Quosh C, el Chammay R, Deville-Stoetzel JB, et al. *Culture, Context and the Mental Health and Psychosocial Wellbeing of Syrians: A Review for Mental Health and Psychosocial Support Staff Working With Syrians Affected by Armed Conflict*. Geneva: UNHCR (2015). Available online at: https://www.unhcr.org/55f6b90f9.pdf (accessed October 14, 2019).
93. Zhang B, Wing Y-K. Sex differences in insomnia: a meta-analysis. *Sleep*. (2006) 29:85–93. doi: 10.1093/sleep/29.1.85
94. Sayar K, Kose S. Psychopathology and depression in the Middle East. *J Mood Disord*. (2012) 2:21–7. doi: 10.5455/jmood.20111217094801
95. Al-Amer MR, Ramjan L, Glew P, Taysir Darwish T, Randall S, Salamonson Y. A reflection on the challenges in interviewing Arab participants. *Nurse Res*. (2018) 26:19–22. doi: 10.7748/nr.2018.e1559

96. Sinai M, Shehade FM. Let's (not) talk about sex: challenges in integrating sex education in traditional Arabic society in Israel. *Int J Adv Couns*. (2019) 41:361–75. doi: 10.1007/s10447-018-9355-x
97. Abdulrehman R. *Working with Refugees from Syria and Surrounding Middle East Countries*. Public Mental Health Initiative (2016). Available online at: http://clinicpsychology.com/wp-content/uploads/2016/04/tip-sheets-final.pdf (accessed October 27, 2019).
98. McNeeley S. Sensitive issues in surveys: reducing refusals while increasing reliability and quality of responses to sensitive survey items. In: Gideon L, editor. *Handbook of survey methodology for the Social Sciences*. New York, NY: Springer (2012). p. 377–96. doi: 10.1007/978-1-4614-3876-2_22

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 09 December 2020
doi: 10.3389/fpsyt.2020.585798

Sociodemographic and Clinical Predictors of the Length of Psychiatric Inpatient Stay of Immigrants in Switzerland

*Renée Frizi[1], Barbara Lay[1], Erich Seifritz[2], Wolfram Kawohl[1], Benedikt Habermeyer[1] and Patrik Roser[1]**

[1] Department of Psychiatry and Psychotherapy, Psychiatric Services Aargau, Academic Teaching Hospital of the University of Zurich, Windisch, Switzerland, [2] Department of Psychiatry, Psychotherapy and Psychosomatics, Psychiatric University Hospital, University of Zurich, Zurich, Switzerland

Immigrants with mental disorders have consistently been reported to spend shorter time in the psychiatric hospital compared to native patients. The aim of this study was to identify sociodemographic, clinical and migration-related predictors of a shorter length of psychiatric inpatient stay among immigrants in Switzerland. All patients of a foreign nationality admitted for inpatient treatment in the year 2016 ($N = 279$) were included in this study. The sample characteristics were drawn from the register of the psychiatric hospital. Within this sample, self-harm and substance use predicted a shorter inpatient treatment episode whereas disturbances of general psychosocial functioning were a predictor of a longer length of stay. As similar results were also reported for non-immigrant patients, the impact of these specific behavioral and social problems on the length of inpatient stay does not appear to be migrant-specific. Moreover, a country of origin outside Europe was a strong predictor of shorter length of stay pointing to inequalities of inpatient psychiatric treatment within the group of immigrants. Therefore, the cultural background and migrant history of immigrants in psychiatry need stronger consideration in order to eliminate disadvantages in mental health care.

Keywords: immigrants, mental disorders, psychiatric hospitalization, inpatient treatment, length of stay

Edited by:
Eric Hahn,
Charité – Universitätsmedizin
Berlin, Germany

Reviewed by:
Euphrosyne Gouzoulis-Mayfrank,
LVR-Klinik Köln, Germany
Iris Tatjana Graef-Calliess,
Hannover Medical School, Germany

Correspondence:
Patrik Roser
patrik.roser@pdag.ch

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *21 July 2020*
Accepted: *13 November 2020*
Published: *09 December 2020*

Citation:
Frizi R, Lay B, Seifritz E, Kawohl W, Habermeyer B and Roser P (2020) Sociodemographic and Clinical Predictors of the Length of Psychiatric Inpatient Stay of Immigrants in Switzerland.
Front. Psychiatry 11:585798.
doi: 10.3389/fpsyt.2020.585798

INTRODUCTION

Migration is a universal phenomenon across the whole globe and throughout the entire history of mankind. It has significantly increased during the ongoing globalization process with its complex social, economic and environmental consequences (1). A number of studies from Europe and North America has linked migration to psychological stress that may lead to manifest psychiatric symptoms and mental illness, particularly schizophrenia, alcohol and drug abuse, anxiety and depression as well as suicidal behavior (2). Interpretation of these findings should, however, consider that the process of migration is highly heterogeneous and its impact on mental health shows a large variation depending on the nature and reasons for the migration and the degree of acculturation (3). Of note, these factors are mainly influenced by the immigrant's personal and social background; the social, cultural, political, and economic conditions of the immigrant's home country; and the recipient society's attitude toward immigrants (3).

Despite the higher risk of developing mental disorders, immigrants from all regions of the world show a general tendency toward a lower use of mental health care services, particularly of specialized mental health and hospital care, compared to the native populations in Europe as well as in North America (4–7). However, there are significant differences within the group of immigrants with the lowest rate of mental health care use by immigrants from East Asia and Latin America and the highest rate among immigrants from Middle East and North Africa (4, 6). Moreover, mental health services are underutilized among recent and labor immigrants, respectively, compared to long-term residents, undocumented immigrants or refugees (6). Apart from the lower utilization, immigrants are also less likely to be referred to psychiatric consultation when presenting psychiatric symptoms (8) and, once they have accessed the mental health care service, also show a higher rate of treatment dropout, compared to the native population (9). Besides these individual factors, structural barriers for the access to mental health care facilities including lack of insurance and language barriers could be identified as a relevant reason for lower rates of mental health care use as well as higher rates of discontinuation of psychiatric outpatient treatment among immigrants (5).

With regard to psychiatric inpatient treatment, immigrants appear to be at a significant disadvantage as well. A large Swiss register study showed that immigrants have lower rates of psychiatric hospitalisations, have more emergency and compulsory admissions, experience more physical restraint, spend shorter time in hospital, are admitted with lower illness severity, and are more likely not to be readmitted, compared to native patients (10, 11). These results particularly applied to immigrants from South Europe, former Yugoslavia, Turkey, East Europe and more distant countries outside Europe, but not to patients from West and North Europe. A further analysis of the data focussing on gender-specific utilization of psychiatric services in Switzerland revealed that mainly male immigrants from Turkey, East Europe and more distant countries showed higher admission rates compared to females from the same countries, pointing to inequalities in mental health care use among immigrants with different migration background (12). Regarding the psychiatric diagnoses, the prevalence of psychotic disorders was, interestingly, similar in immigrants and Swiss patients, whereas the rate of neurotic, stress-related and somatoform disorders was two to three times higher among immigrants from former Yugoslavia, Turkey and more distant countries, and the rate of personality and behavior disorders was three times lower among immigrants from East Europe, compared to natives (13).

A recently published study by our research group investigated the relationship between sociodemographic and clinical variables and the length of inpatient stay in a Swiss psychiatric hospital (14). In the study sample of 1'479 patients that were admitted in the year 2016, several predictors of the length of stay were identified. Among these, of note, immigration, as defined by foreign nationality, was strongly associated with a shorter length of stay compared to Swiss patients. It is, however, not clear whether this result can be explained by sociodemographic, clinical and/or migration-specific factors. We therefore performed a further analysis on the subsample of immigrants ($N = 279$). Specifically, we aimed to analyse more thoroughly migration-specific patient characteristics that were not considered in the former study. Moreover, we expanded the analysis including clinical symptoms and social functioning of these patients as assessed by the Health of the Nations Outcome Scales (HoNOS) which rarely have been evaluated in immigrants in previous studies. The aim of this study was (A) to assess the sociodemographic, clinical, and migration-specific characteristics of immigrants in psychiatric inpatient care, (B) to explore the association between patient characteristics and length of stay, (C) to identify predictors of length of stay, and (D) to draw conclusions about the specific needs of immigrants on a mental health care level.

METHODS

Study Sample

The Department of Psychiatry and Psychotherapy of the Psychiatric Services Aargau (PDAG) provides inpatient mental health care for the Swiss Canton of Aargau, a catchment area of about 680'000 people with mainly suburban (> 10'000 inhabitants) and rural (< 10'000 inhabitants) communities located between the metropolitan areas of Zurich, Bern and Basel [for detailed information on the catchment area, see Stulz et al. (15)]. Moreover, it is the only psychiatric facility for acute inpatient care in duty to provide treatment for all compulsorily admitted people in the Canton of Aargau.

According to the national legal requirements, all psychiatric hospitals in Switzerland are obligated to record all admissions and discharges within their catchment area and to annually report detailed information including sociodemographic, diagnostic and treatment-related characteristics in a standardized form to the Federal Office of Statistics. The hospital doctors in charge of the respective patient are responsible for the documentation. The completion of forms and consistency of information are regularly monitored. Therefore, data on the inpatient episodes are almost complete and can be regarded as sufficiently reliable.

For this study, all patients between 18 and 65 years admitted to the Department of Psychiatry and Psychotherapy of the PDAG between 1 January 2016 and 31 December 2016 were included. In the case of multiple admissions of one patient in this given time period, only the first inpatient episode was considered.

In the year 2016, a total of 1'607 patients were admitted to the Department of Psychiatry and Psychotherapy of the PDAG. Of these, 128 patients were excluded because of missing relevant data. Of the remaining sample of 1'479 patients, a total of 279 patients (18.9%) were immigrants. According to the psychiatric register, the term "immigrant" was defined as any person of a foreign nationality, including refugees, short-term immigrants and long-term residents who were not born or naturalized in Switzerland.

Study Measures

The patients' sociodemographic and clinical data were drawn from the psychiatric register stored on the electronic medical database of the PDAG.

The standard sociodemographic characteristics included information on age, gender, marital status and employment. Moreover, migration-specific variables were assessed, including the period of residence in Switzerland ($\leq$ 5, 5–10, 10–20, 20–30, 30–40, $>$ 40 years), country of origin, legal residency status (documented vs. undocumented immigration), language barriers and migration generation (first generation vs. second generation). Given the relatively small sample size, the countries of origin were grouped into three categories: immigrants coming from a Swiss neighbor country (i.e., Austria, France, Germany, and Italy), from another European country or from a non-European country. Language barriers were estimated by the psychiatrists according to the degree of difficulties in verbal communication.

The clinical variables include the principal psychiatric diagnosis, based on ICD-10 diagnostic criteria, number of previous admissions, type of admission (voluntary vs. compulsory), HoNOS scores at admission and length of inpatient stay. The HoNOS (16) is an established rating instrument for the assessment of the severity of mental disorders and social problems. It consists of 12 items measuring four broader categories: behavior, impairment, symptoms, and social functioning. Each item is rated from 0 (no problems) to 4 (severe to very severe problems), resulting in a total score ranging between 0 and 48. According to the thresholds suggested by Parabiaghi et al. (17), total HoNOS scores higher than 13 are considered to indicate a high level of illness severity while lower scores indicate a rather moderate or low level of illness severity. The HoNOS ratings were made within the first 3 days after admission to the hospital by the doctors responsible for the treatment of the patients.

Statistical Analysis

Length of hospital stay (LOS) was measured in days. The frequency distribution of LOS usually does not follow a normal density function; also in the present sample, it was highly skewed. We therefore naturally logarithmized this measure and used the transformed variable (LN_LOS) as the dependent variable in further statistical analyses [mean 2.82; standard deviation (SD) = 1.11]. Only for descriptive information we refer to the non-transformed LOS data (**Table 1**, **Supplementary Table S1**).

Inspection of the HoNOS data at admission revealed missing data in single items. None of the cases, however, had a HoNOS rating with missing data in more than three items. We calculated the HoNOS total score adding up the scores of the 12 items which provides a total score ranging from 0 to 48. For computation of the HoNOS total score, we imputed missing values: missing item values were substituted with the mean score of all completed items.

We performed regression analyses to explore the kind of association between patient characteristics assessed at admission and the length of hospital stay (LN_LOS). As independent variables, we considered the sociodemographic, migrant-specific, and clinical patient characteristics given in **Table 2**. All variables were first examined separately using univariate regression analysis in order to explore the extent to which they are associated with the outcome.

In a second step, the effects of the explanatory variables were jointly estimated to take into account variable interdependence. We fitted a multiple regression model using forward stepwise variable selection. Probability of F-to-center was fixed at $P < 0.05$. In this analysis, we considered all sociodemographic, migrant-specific and clinical variables for which a significant effect may be assumed (*P*-value of < 0.1 in the bivariate analysis). Seeing that psychiatric diagnoses are strongly overlapping with symptomatic and behavioral problems assessed by the HoNOS, and likewise, the HoNOS total score cannot be regarded as independent from its constituents (HoNOS single items), we did not consider "psychiatric diagnoses" and "HoNOS total score" in this model in order to avoid statistical problems of multicollinearity, but used the HoNOS single items instead.

Data were analyzed using IBM SPSS Statistics for Windows, Version 25.0 (Armonk, NY: IBM Corp.).

RESULTS

Sociodemographic and Clinical Characteristics

The sociodemographic and clinical sample characteristics are given in **Table 1**. The mean age of immigrants ($N = 279$) was 40.5 years (SD = 12.1). Most immigrants had a legal residence permit, belonged to the second generation and had no relevant language barrier. Less than one tenth of this sample were refugees. Half of the immigrants have stayed in Switzerland for more than 20 years and the majority of them came from countries within Europe. Whereas, the 279 inpatient treated immigrants included in this study are representing 18.9% of the total sample of 1'479 inpatients, the percentage of immigrants in the general population of the Canton of Aargau in 2016 was 24.5% (18). This suggests that immigrants are underrepresented in psychiatric inpatient treatment. With respect to clinical characteristics, most immigrants had at least one previous inpatient episode and were admitted on a voluntary basis. The most frequent psychiatric diagnoses included substance use, psychotic and mood disorders. The mean HoNOS total score of 17.2 (SD = 7.0) indicates that the patients were admitted to inpatient treatment with a rather high level of illness severity. In **Supplementary Table S1**, the statistics for the 12 HoNOS scales are detailed. The rate of one fourth of the immigrants that were discharged against medical advice is very comparable with native patients (10). The mean length of stay was 26.2 days (SD = 21.2).

Association Between Sample Characteristics and Length of Stay

Further analysis of the data using univariate regression analysis revealed that distinct sociodemographic and clinical parameters, particularly gender, type of admission, psychiatric diagnosis and the HoNOS at admission, were significantly associated with the length of inpatient stay (**Table 2**). In detail, male patients, patients

TABLE 1 | Characteristics of the study sample ($N = 279$).

	N of patients	%	Length of stay (days)		
			Mean	SD	Median
Sociodemographic variables					
Gender					
female	123	44.1	29.1	22.9	26.0
male	156	55.9	23.9	19.5	20.0
Marital status					
single	112	40.1	26.6	23.5	21.0
married	98	35.1	27.1	21.6	20.5
separated, divorced, widowed	69	24.7	24.3	16.2	21.0
Employment					
employed	92	33.0	28.5	23.0	27.0
unemployed	186	66.7	25.1	20.3	20.0
Migration-specific variables					
Period of stay in Switzerland					
≤ 5 years	37	14.4	17.2	16.5	14.0
5-10	30	11.7	27.1	28.7	17.5
10-20	62	24.1	26.6	17.3	21.0
20-30	59	21.1	26.4	20.7	21.0
30-40	35	12.5	29.6	20.7	28.0
> 40	34	12.2	34.2	21.1	31.0
Country of origin					
neighbor country	110	39.4	29.4	20.4	28.0
other European country	123	44.1	26.9	21.5	20.0
non-European country	46	16.5	16.8	20.0	11.0
Legal residency status					
documented	255	91.4	26.7	20.9	21.0
undocumented / refugee	24	8.6	21.3	23.8	12.0
Barrier of language					
no	209	74.9	27.5	21.3	23.0
yes	70	25.1	22.3	20.7	16.0
Migration generation					
first	36	12.9	26.4	19.0	24.5
second	243	87.1	26.2	21.5	20.0
Clinical variables					
N of previous admissions					
0	99	35.5	25.6	18.6	21.0
≥ 1	162	58.1	25.8	22.4	20.0
Admission					
voluntary	197	70.6	28.6	20.9	25.0
compulsory	82	29.4	20.5	20.9	14.0
Principal diagnosis (ICD-10)					
F1 (substance use disorders)	61	21.9	21.2	16.6	18.0
F2 (psychotic disorders)	67	24.0	30.6	25.6	26.0
F3 (affective disorders)	75	26.9	31.1	19.8	30.0
other	76	27.2	21.6	20.0	16.5
Discharge					
regular	208	74.6	29.3	22.1	26.0
against medical advice	71	25.4	17.2	15.0	14.0
Length of inpatient stay (days)	279	100	26.2	21.2	21.0

Note: Categories do not sum up to 100% in some variables due to missing values.
SD, standard deviation.

TABLE 2 | Association between sample characteristics and length of inpatient stay.

	B	Beta	95% CI	*P*-value
Sociodemographic variables				
Age (years)	0.01	0.10	−0.00; 0.02	0.09
Gender, male	−0.27	−0.12	−0.53; −0.01	0.04
(*ref* female)				
Employment, unemployed	−0.09	−0.04	−0.37; 0.19	0.54
(*ref* employed)				
Migration-specific variables				
Period of stay in Switzerland (years)	0.17	0.26	0.09; 0.25	< 0.001
Country of origin				
Neighbor country	0.36	0.16	0.09; 0.62	0.009
Other European country	0.11	0.05	−0.16; 0.37	0.432
Non-European country	−0.81	−0.27	−1.15; −0.47	< 0.001
Legal residency status, undocumented/refugee	−0.39	−0.10	−0.85; 0.08	0.10
(*ref* documented)				
Barrier of language, yes	−0.27	−0.10	−0.57; 0.03	0.08
(*ref* no)				
Migration generation, second	−0.05	−0.01	−0.44; 0.34	0.80
(*ref* first)				
Clinical variables				
N of previous admissions, ≥ 1	−0.08	−0.03	−0.36; 0.21	0.60
(*ref* 0)				
Admission, compulsory	−0.59	−0.24	−0.87; −0.31	< 0.001
(*ref* voluntary)				
Principal diagnosis (ICD-10)				
F1 (substance use disorders)	−0.21	−0.08	−0.53; 0.10	0.19
F2 (psychotic disorders)	0.18	0.07	−0.12; 0.49	0.25
F3 (affective disorders)	0.40	0.16	0.11; 0.69	0.007
Other	−0.38	−0.15	−0.67; −0.09	0.01
HoNOS items				
HoNOS 01, Aggression and overactivity	−0.17	−0.20	−0.27; −0.07	0.001
HoNOS 02, Self-harm	−0.11	−0.12	−0.23; −0.00	0.05
HoNOS 03, Substance use	−0.17	−0.24	−0.26; −0.09	< 0.001
HoNOS 04, Cognition	0.14	0.14	0.02; 0.25	0.02
HoNOS 05, Physical health	0.14	0.16	0.04; 0.24	0.007
HoNOS 06, Hallucinations and delusions	−0.001	−0.001	−0.10; 0.10	0.98
HoNOS 07, Depression	0.19	0.20	0.08; 0.29	0.001
HoNOS 08, Other symptoms	0.03	0.03	−0.07; 0.12	0.59
HoNOS 09, Social relations	0.004	0.005	−0.10; 0.11	0.93
HoNOS 10, General functioning	0.29	0.35	0.19; 0.38	< 0.001
HoNOS 11, Housing	0.08	0.10	−0.02; 0.18	0.13
HoNOS 12, Activities	0.10	0.12	0.00; 0.19	0.05
HoNOS, Total score	0.02	0.10	−0.002; 0.03	0.08

Univariate regression analyses.
HoNOS, Health of the Nations Outcome Scales: up to 23 (8.2%) missing values in some items.
Length of stay (log-transformed).

with compulsory admission and patients with aggressive and overactive behavior, self-harm as well as substance use, according to the HoNOS, spent shorter time in hospital. On the other hand, affective disorders as well as cognitive problems, physical illness or disability, depressed mood, problems of general psychosocial functioning and problems with occupation and activities were associated with longer duration of inpatient treatment. With respect to the migration-specific characteristics, immigrants with a shorter period of stay in Switzerland and the country of origin outside Europe spent less time in hospital. In detail, the length

TABLE 3 | Predictors of length of inpatient stay.

	B	Beta	95% CI	*P*-value
Migration-specific variables				
Country of origin, non-European	−0.72	−0.26	−1.11; −0.33	< 0.001
Clinical variables				
HoNOS 02, Self-harm	−0.14	−0.16	−0.27; −0.02	0.024
HoNOS 03, Substance use	−0.18	−0.25	−0.28; −0.08	< 0.001
HoNOS 10, General functioning	0.17	0.21	0.06; 0.28	0.004

Multiple regression analysis; forward variable selection; $N = 176$.
HoNOS, Health of the Nations Outcome Scales.
LOS, length of stay (log-transformed).
Adjusted $R^2 = 0.208$; $F = 12.487$ *(4 df);* $P < 0.001$.

of inpatient stay of immigrants who lived in Switzerland for <5 years was by far the shortest and it gradually increased with the period of residence in the host country. Similarly, immigrants from a non-European country showed the shortest length of inpatient stay compared to immigrants from a Swiss neighbor or another European country. No statistically significant effect on the time spent in hospital was found for age, employment, legal residency status, language barrier and migration generation.

Predictors of Length of Psychiatric Inpatient Stay

Results of a stepwise linear regression revealed (out of all sociodemographic and clinical patient characteristics considered in this study) a set of four predictor variables which explained length of inpatient stay best (**Table 3**). Results suggest that, even after controlling for the effects of behavioral and social problems (as assessed by the four HoNOS items included in the model), a "country of origin outside Europe" is a statistically significant predictor of a shorter inpatient stay. "Self-harm" and "substance use" were further factors predicting shorter length of stay, whereas the HoNOS rating "problems of general functioning" was significantly associated with a longer psychiatric inpatient episode. Other variables that showed significant effects in the univariate regression analysis did not further contribute to this model.

DISCUSSION

Shorter length of inpatient stay of foreign nationals in psychiatry (14) raises questions which are relevant for mental health care, namely of people who not rarely suffer from psychological stress and mental disorders. The purpose of this study was to evaluate which of the migration-specific, clinical and sociodemographic factors assessed at admission to the psychiatric hospital might contribute to an explanation of this shorter inpatient treatment.

The analysis of the immigrants' data revealed that a country of origin "outside Europe" was a strong predictor of a shorter length of psychiatric inpatient stay. This finding is in accordance with a previous Swiss case-control study that examined a variety of clinical measures, including the length of stay, in a large sample of immigrants ($N = 4'826$) compared to natives matched for age, gender and psychiatric diagnosis (10). This study showed that the length of psychiatric inpatient stay mainly depends on the country of origin, with immigrants from more distant countries, particularly from countries outside Europe, spending significantly less time in hospital compared to Swiss controls. On the other hand, immigrants from European countries, especially from countries located closest to Switzerland, showed a length of stay that was comparable to natives. Given the relatively small sample size in our study, we did not divide the group of immigrants into distinct geographical regions but assigned the country of origin to Swiss neighbor countries, other European and non-European countries. However, despite this rather rough classification, our results are still consistent to the study by Lay et al. (10) as those regions of origin that were reported to be associated with a shorter length of stay are predominantly located outside Europe.

Several explanations on the structural and individual level need to be discussed when interpreting the finding of a shorter length of stay of immigrants from countries outside Europe compared to Swiss neighbor and other European countries. First of all, there are no specific barriers for the access to and the period of inpatient psychiatric treatment as regards the health care policy in Switzerland, the cost recovery by the obligatory health insurance and the availability of sufficient financial and personnel resources in the health care system. It therefore appears less probable that structural conditions might be the reason for inequalities in inpatient treatment (19).

On the other hand, shorter length of stay of immigrants from non-European countries rather might be explained by cultural, ethnic or language differences. The immigrants' cultural and ethnic background was reported to have a strong influence on the vulnerability for mental illness as well as on resilience and coping mechanisms (3, 20). Moreover, it may also affect the patients' understanding of mental health care. In particular, the individual concepts of mental health and illness as well as the expectations and perceptions of psychiatric treatment show a large variety across different ethnicities (21–23). These cultural and ethnic differences are, in principal, more dominant in immigrants from more distant countries, especially from outside Europe, compared to immigrants from European countries that share, to some extent, a comparable cultural identity. In line with this, immigrants who lived for a shorter time in Switzerland spent shorter time in the hospital, compared to immigrants with a longer period of residence.

In connection with the cultural and ethnic differences, the dimensions of acculturation in the host country should also be taken into consideration when interpreting the results of this study. Berry (24) proposed the four dimensions of acculturation "integration," "assimilation," "separation," and "marginalization" according to the psychological, behavioral and social changes resulting from being in continuous contact with other cultures. The acculturation domains "integration" and "assimilation" were often reported to be associated with better mental health status as well as higher rates of mental health care utilization, whereas "separation" and "marginalization" were linked to poor mental health outcomes and lower rates of mental health care utilization (25–28). The results of our study appear to confirm the impact of acculturation on the use of mental health care services. Immigrants with a shorter period of residence in Switzerland and a country of origin outside Europe, respectively, spent significantly shorter time in the hospital, presumably due to a lower degree of integration in the host country. On the other hand, it can be assumed that the longer length of inpatient stay of immigrants who lived in Switzerland for a longer time and/or came from a European country, and particularly from a Swiss neighbor country, resulted, at least in part, from a higher degree of integration. However, this conclusion should be drawn with caution as the dimensions of acculturation were not assessed in this study.

During inpatient treatment, language barriers may promote additional problems in the communication between immigrant patients and mental health professionals, increasing the risk of misunderstandings, misinterpretations and misdiagnosis that might result in earlier discharge of these patients (29). In our study, language barriers were not associated with the length of inpatient stay. That no such link could be found, however, is not surprising taking into consideration that the majority of this sample were second generation migrants, many of them speaking German as their native language.

Apart from the country of origin, specific behavioral and social problems, as assessed by the HoNOS, could be identified as predictors of the length of psychiatric inpatient treatment among immigrants. To the best of our knowledge, this is the first study that has analyzed the HoNOS in the context of migrant health. In particular, self-harm and substance use are associated with a shorter length of stay, whereas disturbances of general psychosocial functioning predicted a longer episode of inpatient treatment.

The HoNOS comprises a set of 12 single items with each of them representing a relatively independent scale. It was therefore recommended to consider the single items rather than the HoNOS total score for obtaining a differential and realistic picture of the impairment of patients with mental disorders in the clinical setting (16). Moreover, the use of the HoNOS items allows to assess specific psychopathological problems that are not fully covered by the principal psychiatric diagnoses. In accordance with this conclusion, we also found no association between the HoNOS total score and length of stay whereas some single HoNOS items contributed significantly to its prediction.

The results that have been obtained from the analysis of the HoNOS items largely confirm the findings of a previous study on the predictive value of psychopathological syndromes and symptoms for the length of stay. In this study, however, psychiatric inpatients in general, irrespective of the presence of a migration status, have been analyzed (30). The authors showed that crisis intervention, acute psychiatric care and compulsory admission as well as substance-related disorders were the strongest predictors of a shorter length of stay, whereas social withdrawal, depressiveness and memory disturbances increased the length of stay. The reasons for the necessity of crisis intervention, acute psychiatric care and compulsory admission were not given, but it can be assumed that these interventions were due to aggressive behavior, self-harm or suicidality. Taken together, it seems that the impact of psychopathological syndromes and symptoms on the length of inpatient stay is very similar in immigrants and non-immigrants. The present findings suggest that, beyond these common psychopathological factors, however, migration-related challenges moreover play a decisive role for treatment and discharge decisions in immigrants.

Several limitations have to be taken into account when interpreting the results of this study. (A) The present findings were not validated against a control group. It should be considered, however, that in this study we were interested in particular in migration-specific aspects which cannot be applied to non-immigrant patients. (B) Given the relatively small sample size, we did not perform a more fine-grained analysis of sample characteristics, such as country of origin. (C) The language barriers were estimated by the psychiatrists of the hospital according to the degree of difficulties in communication during inpatient treatment. These estimations strongly depend on the doctors' subjective perceptions. (D) We were not able to retrospectively assess the intercultural competences of the mental health care professionals who were involved in the inpatient treatment of the immigrants as well as in the decision about their discharge from the hospital. It can be suggested that poor intercultural competences might have contributed to differences in the length of inpatient stay, depending on the immigrants' cultural distance from the host country and their degree of integration. (E) Considering the overall small sample size of this study, the incomplete data, the interdependence of variables considered in the model as well as potential uncontrolled confounding, the results of the regression model should be regarded as preliminary unless this model is corroborated by further analyses. (F) Given the explorative nature of this study, further research in a larger sample of immigrants that are carefully matched to native patients is required to corroborate the findings and to better understand the specific needs of migrants with different cultural and ethnic background.

In summary, the results of this study show that shorter length of psychiatric inpatient stay among immigrants in Switzerland are predicted by their country of origin as well as by behavioral and social disturbances. The behavioral and social problems that were significantly associated with a shorter length of stay, however, do not appear to be migrant-specific, as similar findings have also been reported for non-immigrant patients. The shorter length of stay of immigrants from more distant countries, particularly from non-European countries, points to inequalities of inpatient psychiatric treatment. The consequences of such inequalities may comprise insufficient or inappropriate treatment, disappearance from the mental health care system, longer duration of untreated disease, higher rates of chronification and complications, and overall poorer outcome and prognosis. To eliminate disadvantages in mental health care, we must give more consideration to the cultural background and migrant history of immigrants 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 human participants were reviewed and approved by Ethikkommission Nordwest- und Zentralschweiz (EKNZ). Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

PR, BH, ES, and WK contributed to the study conception and research design. RF and BL conducted the data collection and analysis. RF, BL, and PR contributed to the drafting of the manuscript. All authors commented and contributed to the final version of the manuscript and have given final approval.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.585798/full#supplementary-material

REFERENCES

1. Segal UA. Globalization, migration, and ethnicity. *Public Health.* (2019) 172:135–42. doi: 10.1016/j.puhe.2019.04.011
2. Carta MG, Bernal M, Hardoy MC, Haro-Abad JM. Migration and mental health in Europe (The State of the Mental Health in Europe Working Group: Appendix 1). *Clin Pract Epidemiol Ment Health.* (2005) 1:13. doi: 10.1186/1745-0179-1-13
3. Bhugra D. Migration and mental health. *Acta Psychiatr Scand.* (2004) 109:243–58. doi: 10.1046/j.0001-690x.2003.00246.x
4. Abebe DS, Lien L, Elstad JI. Immigrants' utilization of specialist mental healthcare according to age, country of origin, and migration history: a nation-wide register study in Norway. *Soc Psychiatry Psychiatr Epidemiol.* (2017) 52:679–87. doi: 10.1007/s00127-017-1381-1
5. Derr AS. Mental health service use among immigrants in the United States: a systematic review. *Psychiatr Serv.* (2016) 67:265–74. doi: 10.1176/appi.ps.201500004
6. Durbin A, Moineddin R, Lin E, Steele LS, Glazier RH. Mental health service use by recent immigrants from different world regions and by non-immigrants in Ontario, Canada: a cross-sectional study. *BMC Health Serv Res.* (2015) 15:336. doi: 10.1186/s12913-015-0995-9
7. Lindert J, Schouler-Ocak M, Heinz A, Priebe S. Mental health, health care utilisation of migrants in Europe. *Eur Psychiatry.* (2008) 23(Suppl. 1):14–20. doi: 10.1016/S0924-9338(08)70057-9
8. Gramaglia C, Gambaro E, Delicato C, Di Marco S, Di Tulli E, Vecchi C, et al. Pathways to and results of psychiatric consultation for patients referred from the emergency department. Are there differences between migrant and native patients? *Transcult Psychiatry.* (2019) 56:167–86. doi: 10.1177/1363461518798844
9. Gramaglia C, Gambaro E, Rossi A, Toso A, Feggi A, Cattaneo CI, et al. Immigrants' pathways to outpatient mental health: are there differences with the native population? *J Immigr Minor Health.* (2016) 18:878–85. doi: 10.1007/s10903-015-0336-4
10. Lay B, Lauber C, Nordt C, Rössler W. Patterns of inpatient care for immigrants in Switzerland: a case control study. *Soc Psychiatry Psychiatr Epidemiol.* (2006) 41:199–207. doi: 10.1007/s00127-005-0014-2
11. Tarsitani L, Pasquini M, Maraone A, Zerella MP, Berardelli I, Giordani R, et al. Acute psychiatric treatment and the use of physical restraint in first-generation immigrants in Italy: a prospective concurrent study. *Int J Soc Psychiatry.* (2013) 59:613–8. doi: 10.1177/0020764012450985
12. Lay B, Nordt C, Rössler W. Mental hospital admission rates of immigrants in Switzerland. *Soc Psychiatry Psychiatr Epidemiol.* (2007) 42:229–36. doi: 10.1007/s00127-007-0157-4
13. Lay B, Lauber C, Rössler W. Are immigrants at a disadvantage in psychiatric in-patient care? *Acta Psychiatr Scand.* (2005) 111:358–66. doi: 10.1111/j.1600-0447.2004.00509.x
14. Habermeyer B, De Gennaro H, Frizi R, Roser P, Stulz N. Factors associated with length of stay in a Swiss mental hospital. *Psychiatr Q.* (2018) 89:667–74. doi: 10.1007/s11126-018-9569-4
15. Stulz N, Nevely A, Hilpert M, Bielinski D, Spisla C, Maeck L, et al. Referral to inpatient treatment does not necessarily imply a need for inpatient treatment. *Adm Policy Ment Health.* (2015) 42:474–83. doi: 10.1007/s10488-014-0561-5
16. Andreas S, Harfst T, Rabung S, Mestel R, Schauenburg H, Hausberg M, et al. The validity of the German version of the Health of the Nation Outcome Scales (HoNOS-D): a clinician-rating for the differential assessment of the severity of mental disorders. *Int J Methods Psychiatr Res.* (2010) 19:50–62. doi: 10.1002/mpr.305
17. Parabiaghi A, Barbato A, D'Avanzo B, Erlicher A, Lora A. Assessing reliable and clinically significant change on Health of the Nation Outcome Scales: method for displaying longitudinal data. *Aust N Z J Psychiatry.* (2005) 39:719–25. doi: 10.1080/j.1440-1614.2005.01656.x
18. Kanton Aargau. *Bevölkerungsstatistik 2016: Jahrespublikation*. (2016). Available online at: https://www.ag.ch/media/kanton_aargau/dfr/dokumente_3/statistik/publikationen/statistikthemen/bevoelkerung_1/Bevoelkerungsstatistik_2016.zip
19. Baleydier B, Damsa C, Schutzbach C, Stauffer O, Glauser D. Comparison between Swiss and foreign patients' characteristics at the psychiatric emergencies department and the predictive factors of their management strategies. *Encephale.* (2003) 29:205–12.
20. Tai-Ann Cheng A, Chang JC. Mental health aspects of culture and migration. *Curr Opin Psychiatry.* (1999) 12:217–22.
21. Ortega AN, Alegría M. Denial and its association with mental health care use: a study of island Puerto Ricans. *J Behav Health Serv Res.* (2005) 32:320–31. doi: 10.1007/BF02291831
22. Perkins RE, Moodley P. Perception of problems in psychiatric inpatients: denial, race and service usage. *Soc Psychiatry Psychiatr Epidemiol.* (1993) 28:189–93. doi: 10.1007/BF00797322
23. Saravanan B, Jacob KS, Johnson S, Prince M, Bhugra D, David AS. Belief models in first-episode schizophrenia in South India. *Soc Psychiatry Psychiatr Epidemiol.* (2007) 42:446–51. doi: 10.1007/s00127-007-0186-z
24. Berry JW. Immigration, acculturation, and adaptation. *Appl Psychol Int Rev.* (1997) 46:5–34. doi: 10.1080/026999497378467
25. Bauldry S, Szaflarski M. Immigrant-based disparities in mental health care utilization. *Socius.* (2017) 3:10. doi: 10.1177/2378023116685718
26. Brand T, Samkange-Zeeb F, Ellert U, Keil T, Krist L, Dragano N, et al. Acculturation and health-related quality of life: results from the German National Cohort migrant feasibility study. *Int J Public Health.* (2017) 62:521–9. doi: 10.1007/s00038-017-0957-6
27. Fassaert T, Hesselink AE, Verhoeff AP. Acculturation and use of health care services by Turkish and Moroccan migrants: a cross-sectional population-based study. *BMC Public Health.* (2009) 9:332. doi: 10.1186/1471-2458-9-332
28. Nap A, van Loon A, Peen J, van Schaik DJ, Beekman AT, Dekker JJ. The influence of acculturation on mental health and specialized mental healthcare for non-western migrants. *Int J Soc Psychiatry.* (2015) 61:530–8. doi: 10.1177/0020764014561307
29. Künzler N, Garcia-Brand E, Schmauss M, Messer T. German language skills among foreign psychiatric patients: influence on voluntariness and duration of hospital treatment. *Psychiatr Prax.* (2004) 31(Suppl.1):21–3. doi: 10.1055/s-2004-828421

30. Warnke I, Rössler W, Herwig U. Does psychopathology at admission predict the length of inpatient stay in psychiatry? Implications for financing psychiatric services. *BMC Psychiatry*. (2011) 11:120. doi: 10.1186/1471-244X-11-120

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 23 December 2020
doi: 10.3389/fpsyt.2020.580103

Mental Health Determinants Among a Psychiatric Outpatient Sample of Vietnamese Migrants in Germany

Simon Wolf[1]*, **Eric Hahn**[1], **Katja Wingenfeld**[1], **Main Huong Nguyen**[1], **Anita von Poser**[2], **Thi Hoa Nguyen**[1,3], **Bernd Hanewald**[4], **Kerem Böge**[1], **Malek Bajbouj**[1], **Michael Dettling**[1], **Van Tuan Nguyen**[3] **and Thi Minh Tam Ta**[1,5]

[1] Department of Psychiatry and Psychotherapy, Charité–Universitätsmedizin Berlin, Berlin, Germany, [2] Institute of Social and Cultural Anthropology, Freie Universität Berlin, Berlin, Germany, [3] Department of Psychiatry, Hanoi Medical University, Hanoi, Vietnam, [4] Department of Psychiatry and Psychotherapy, Universitätsklinikum Gießen and Marburg, Gießen, Germany, [5] Berlin Institute of Health, Berlin, Germany

Edited by:
Patrik Roser,
Psychiatric Services
Aargau, Switzerland

Reviewed by:
Tore Wentzel-Larsen,
Norwegian Centre for Violence and
Traumatic Stress Studies, Norway
Umut Altunoz,
KRH Psychiatry Wunstorf, Germany

***Correspondence:**
Simon Wolf
simon.wolf@charite.de

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *04 July 2020*
Accepted: *20 October 2020*
Published: *23 December 2020*

Citation:
Wolf S, Hahn E, Wingenfeld K, Nguyen MH, von Poser A, Nguyen TH, Hanewald B, Böge K, Bajbouj M, Dettling M, Nguyen VT and Ta TMT (2020) Mental Health Determinants Among a Psychiatric Outpatient Sample of Vietnamese Migrants in Germany. Front. Psychiatry 11:580103. doi: 10.3389/fpsyt.2020.580103

Background: Mental health risk-factors for Asian migrants have been studied almost exclusively in the US, Canada, and Australia but not in European countries. Therefore, we aimed to identify sociodemographic, clinical, and migration-surrounding factors associated with experienced mental distress among Vietnamese migrants in Germany.

Method: 305 Vietnamese migrants utilizing Germany's first Vietnamese psychiatric outpatient clinic filled out at admission the Brief-Symptom-Inventory 18 (BSI-18) as well as a questionnaire on 22 potential mental health determinants. Using a multiple linear regression model, we identified those sociodemographic, clinical, and migration-surrounding factors that were significantly related to the Global Severity Index (GSI) of the BSI-18.

Results: The factors *unemployment* ($B = -6.32$, $p = 0.014$), *financial problems* ($B = -10.71$, $p < 0.001$), *no or only little religious involvement* ($B = -3.23$, $p = 0.002$), *no psychiatric precontact* ($B = -7.35$, $p = 0.004$), *previous migration experiences* ($B = 8.76$, $p = 0.002$), and *perceived discrimination* ($B = 6.58$, $p = 0.011$) were found to significantly increase the level of mental distress according to the BSI-GSI.

Conclusion: Based on these results, we were able to construct a mental health risk-profile for Vietnamese migrants in Germany, which aims to detect candidates for psychiatric problems earlier and supply them with customized prevention and therapy options.

Keywords: Vietnamese, Germany, migrants, BSI-18, mental health determinants

INTRODUCTION

Even today, Asian migrants are still being found to underreport psychological complaints and to under utilize mental health care services worldwide (1). Therefore, gaining improved clinical access to these "hard-to-reach" populations represents an ongoing challenge for the mental health care system of the twenty-first century. An essential step forward might be the early diagnostic identification and supply of candidates for psychiatric problems by implementing risk-profiles and adapted therapy options. At the same time, however, preliminary research on the specific components of such risk-profiles remains to be rare and widely restricted to Asian migrants in the US, Canada, and Australia.

With regard to Asian Americans, Kramer et al. (2) formulated eight "key factors" of particular interest when dealing with their mental health situation: *age*; *gender*; *language skills*; *occupation-related issues*; *religiosity and spirituality*; *traditional beliefs about mental health*; *the level of acculturation;* and *family or intergenerational issues*. Additionally, the authors noted that the *socioeconomic condition* and *immigration status* play a significant role for the mental health and well-being of Asian migrants (2). A large body of empirical research has confirmed the relevance of these key factors. The factor *age* was found to impact mental health in two ways: Asian Americans with a younger age at migration exhibited a higher 12-month and lifetime risk for mental disorders (3). Furthermore, advanced age was associated with increased psychiatric problems among older Asians in Canada (4). The factor *gender* appears to affect mental health differently depending on the type of psychiatric disorder taken into consideration. While significantly more mood- and anxiety-related complaints were reported among South Asian women in Canada (5), the opposite was the case concerning the rates of substance abuse among Indians in the United States (6). However, it should be noted, that this finding does not only account for Asian men and women in the US or Canada, but also for the mainstream populations worldwide, where mood- and anxiety-disorders appear to be generally more widespread among women. In contrast, addiction-disorders seem to be more common among men (7). The lack of sufficient *language skills* has been identified as an independent mental risk-factor, for example, among Southeast Asians in Canada (8), but also as an aggravating factor when hindering American Asians from utilizing treatment due to perceived language barriers (9). The same applies to the factor *unemployment*, as it was revealed to directly reduce the mental health status of Southeast Asians in Canada (8), while simultaneously exasperating other risk factors, such as an already *strained financial situation* linked to the migration process or educational disadvantages and social exclusion (8). *Religious involvement* and *mental health beliefs* are often interrelated in their impact on mental health, especially among Asians, due to the close connection between religion and health within their value system (10). Accordingly, studies have documented a positive effect of religiosity on mental health, for instance, higher self-rated subjective well-being among Chinese Americans with more frequent religious attendance (11). Some studies, however, have reported the opposite when religiosity interferes with the concept of mental health (care) (12).

Regarding the factor *level of acculturation*, studies among Vietnamese migrants in Germany have linked both, the orientation toward the heritage society as well as toward the mainstream society to a decreased level of depressiveness, while the rejection of both (in the form of the marginalization acculturation strategy) was found to be associated with the highest severity level of depression (13). Furthermore, the pattern of mental health care utilization appears to depend on the level of acculturation, as has been shown in a qualitative survey of Asian migrants in Australia (14). Finally, *family and intergenerational issues* can negatively affect Asian migrants' mental health through a gap between traditional Asian family values and those of the mainstream society (15).

In contrast to the number of studies on mental health determinants of Asian migrants in the US, Canada, and Australia, risk-factors for the mental health of European Asians have been studied very little so far and only in conjunction with other migrant populations but not individually (16). One of these barely researched groups are Vietnamese migrants in Germany—with around 99,000 individuals in 2019 one of the country's largest Asian populations, and with 26,000 members the largest Southeast Asian community in the capital of Berlin (17). Among the few existing German studies on this migrant group, a survey of 82 Vietnamese living in the city of Leipzig exhibited higher anxiety and depression scores as well as a lower mental health care utilization than in the German control sample (18). Moreover, social assimilation and perceived discrimination were identified as significant influencers of both psychiatric syndromes. These results were partly confirmed by subsequent studies when the number of experienced migration-associated stressors (including discrimination) (19), as well as the strategy of acculturation (13), were found to impact the severity of depression among Vietnamese outpatients in Berlin.

Apart from these very few studies, however, there have been hardly any further investigations on mental health determinants among Vietnamese migrants in Germany. Therefore, using data from a Vietnamese psychiatric outpatient-cohort, the present study aimed to identify sociodemographic, clinical, and migration-related risk-factors associated with experienced psychological distress, as indicated by the Global Severity Index of the BSI-18. The resulting profile could then be used to detect persons at risk earlier and supply them with adapted prevention and therapy options.

METHODS

Procedure

The data was collected between 2012 and 2018 within the specialized psychiatric outpatient clinic for Vietnamese migrants at the Charité - Universitätsmedizin, Department for Psychiatry and Psychotherapy, Campus Benjamin Franklin, Berlin, Germany. All patients attending the clinic were initially screened with the Mini International Neuropsychiatric Interview [MINI 5.0 (20)] by trained bilingual psychiatrists.

Subsequently, those patients fulfilling the criterion of having at least one psychiatric diagnosis according to ICD-10 answered the Brief Symptom Inventory-18 [BSI-18; (21)]. The questionnaire was administered in either the German or the Vietnamese language. Since no Vietnamese version of the BSI-18 has been validated yet, we translated the German Version into written Vietnamese language using the technique of back-translation, carried out by different bilingual translators (22). Afterwards, all patients received another questionnaire in either the German or Vietnamese language, assessing sociodemographic, clinical, or migration-related facts.

Patients with signs of acute suicidality, according to the MINI, were excluded from the study. Data used for the current research was exclusively collected at patients' first admission before undergoing treatment. All subjects gave written informed consent before participating and received no financial compensation. The study was approved by the ethics committee of the Charité - Universitätsmedizin, Berlin, Germany.

Instruments

The outcome criterion of interest was the Global Severity Index (GSI) of the Brief Symptom Inventory-18. The BSI-18 is a frequently used self-report questionnaire that is designed to measure the current level of psychological distress in adult individuals. It consists of three subscales with each assessing a common psychiatric syndrome, namely somatization (items 1, 4, 7, 10, 13, 16), depression (items 2, 5, 8, 11, 14, 17), and anxiety (items 3, 6, 9, 12, 15, 18). The 18 items are allocated equally across the three subscales, with each examining on a 5-point Likert scale (from 0 = "not at all" to 4 = "extremely") to what extent the respective symptom burdened the respondent during the previous 7 days. The subscales' raw scores (ranging from 0 to 24) can be interpreted individually or summed up to create the GSI (ranging from 0 to 72), whereby higher ratings reflect considerably more experienced distress. The BSI-18 has been shown to have good psychometric reliability (23). In the current study, the average intercorrelation (Cronbach's α) between all BSI-18-items was $\alpha = 0.96$, indicating an excellent internal consistency for the BSI-GSI outcome measure.

Potential predictive factors were taken from a questionnaire originally containing a total of 39 items about sociodemographic, clinical, and migration-related factors that was completed by all patients upon the first admission to the outpatient clinic. Based on theoretical considerations as well as on extensive literature research (Medline, PSYNDEX, and PsycINFO) on factors that are generally relevant for the mental health of Asian migrants, we preselected 22 questionnaire-items as potential BSI-GSI predictors. This procedure was chosen because a theoretical framework regarding factors that are especially relevant for the mental health status of Vietnamese migrants has to our knowledge not been published yet.

Sociodemographic candidate variables were *age* (continuous variable), *gender* (binary variable: "male" or "female"), *marital status* (binary variable: "without partnership" or "in a partnership"), *number of children* (continuous variable), *number of household members* (continuous variable), *years of education* (continuous variable), *occupational status* (binary variable: "in work" or "no work"), *financial status* (binary variable: "not sufficient" or "sufficient"), and *the current role of religion* (continuous variable with a four-point response option ranging from "not important" to "very important"). Clinically relevant candidate variables were the *duration of persisting symptoms* (continuous variable, in months), *precontact to the psychiatry* (binary variable: "no" or "yes") and *past suicide attempt(s)* (binary variable: "no" or "yes"). Migration-related candidate variables were *years lived in the host country* (continuous variable), *age at migration* (continuous variable), *the status of current residence* (binary variable: "unsafe" or "safe"), *German language skills* (continuous variable with a five-point response option ranging from "very good" to "none"), *previous migration experiences* (binary variable: "no" or "yes"), *feeling of being at home in Germany* (binary variable: "no" or "yes"), *close connection to the home country* (binary variable: "no" or "yes"), *perceived discrimination* (binary variable: "no" or "yes"), and the two dimensions of acculturation: the *identification toward the mainstream society* (continuous variable) as well as the *identification toward the ethnic society* (continuous variable).

The two dimensions of acculturation were assessed with the Stephenson Multigroup Acculturation Scale [SMAS; (24)]. The scale consists of a 15-item Dominant Society Immersion (DSI) subscale that measures participants' identification toward the mainstream society and a 17-item Ethnic Society Immersion (ESI) subscale that measures participants' identification toward their ethnic society. After the participants had rated each item on a 4-point Likert scale (1 = "false," 2 = "partly false," 3 = "partly true," and 4 = "true"), summative scores were computed for each subscale with higher scores indicating a greater level of immersion toward the dominant or ethnic society. In our study Cronbach's α over all 32 SMAS-items was 0.80 as well as 0.85 for the DSI- and 0.79 for the ESI-subscale, demonstrating good internal consistency of the scale.

Statistical Analysis

Descriptive statistics were used to describe the sample characteristics. Single item scores of all 18 BSI-items were summed up to create the dependent outcome variable BSI-GSI. For every participant, the sum score was only calculated if at least 75% of the BSI-18 items were rated. A drop-out analysis was conducted to assess possible differences in *age*, *gender* and *level of education* between participants with less and more than 25% missing data on the BSI-18 items. Cronbach's α was calculated as an indicator of internal consistency of the BSI-GSI scale and the SMAS scale. Preliminary analyses were performed to ensure that there was no violation of the assumption of normality, linearity, multicollinearity, and homoscedasticity.

The principal analysis was carried out in two steps: First, to explore the statistical relationship of each candidate variable with the BSI-GSI-score, we conducted three separate multiple regression models, one model with the sociodemographic and the other two with the clinical and migration-related variables. Second, those variables with a p-value of ≤ 0.05 were then included in a final multiple linear regression model, to achieve the most informative and parsimonious combination of BSI-GSI predictors. Statistical analyses were calculated with IBM SPSS (Version 24 for macOS). Values of $p \leq 0.05$ were considered as statistically significant and values of $p \leq 0.001$ as highly significant.

RESULTS

Sample Characteristics

The demographic and migration-related sample characteristics of the in total 305 patients with Vietnamese background are shown in **Table 1**. Regarding further clinical details, the mean BSI-GSI score was 23.54 (SD = 19.22). Across all diagnostic categories,

TABLE 1 | Sample Characteristics ($N = 305$).

Characteristics	n^a (%)	*M (SD)*^{b}
Sociodemographic characteristics		
Age (in years)		44.7 (12.9)
Gender (female)	233 (76.4%)	
Marital status (has partner)	132 (43.6%)	
Number of children		1.8 (1.4)
Number of household members		2.6 (1.4)
Years of education		10.0 (3.1)
Occupational status (working)	57 (26.5%)	
Financial status (sufficient)	65 (21.8%)	
Current role of religion		
Not important	44 (14.7%)	
Less important	72 (24.1%)	
Important	50 (16.4%)	
Very important	139 (45.6%)	
Acculturation characteristics		
Years lived in the host country		16.2 (10.4)
Age at migration		27.5 (10.1)
Status of current residence (unsecure)	138 (45.7%)	
German language skills		
Very good	11 (3.7%)	
Good	23 (7.7%)	
Moderate	93 (31.1%)	
Few	110 (36.8%)	
None	62 (20.7%)	
Previous migration experiences (yes)	62 (21.1%)	
Feeling of being at home in Germany (yes)	199 (67.5%)	
Close connection to the home country (yes)	217 (73.1%)	
Perceived discrimination (yes)	104 (34.1%)	
Dimension of acculturation		
Dominant Society Immersion (DSI)		33.05 (9.32)
Ethnic Society Immersion (ESI)		56.24 (10.20)
Clinical characteristics		
ICD-10 main diagnosis (F5x, F7x and F9x unrepresented)		
F0x	9 (3.0%)	
F1x	2 (0.7%)	
F2x	42 (13.8%)	
F3x	193 (63.3%)	
F4x	56 (18.4%)	
F6x	2 (0.7%)	
F8x	1 (0.3%)	
Average length of symptomatology (in months)		23.0 (37.7)
Precontact to the psychiatry (yes)	92 (30.2%)	
Past suicide attempt (yes)	29 (9.9%)	

^{a}Subsample (values vary because of missing data); ^{b}Mean (Standard Deviation).

the symptomatology was present for an average time of 23.0 (SD = 37.7) months at the date of the first admission. 92 (30.2%) patients had a former contact with the mental health care system, and 29 (9.9%) had attempted suicide at least once in the past.

Drop-Out Analysis

The data of 51 participants were not included in the analysis because more than 25% of their BSI-18 information was missing. A drop-out analysis was conducted to assess potential deviations in *age, gender*, and *years of education* between participants with less and more than 25% missing data. However, no significant differences were found between the groups of included and excluded participants, regarding *age* [$t_{(303)} = -0.899, p = 0.369$], *gender* [$\chi^2_{(1,n=305)} = 0.502, p = 0.479$], and *years of education* [$t_{(297)} = 0.599, p = 0.133$].

Sociodemographic, Clinical, and Migration-Related Predictors of the GSI

Out of 22 initially considered candidate variables, the three separate multiple regression models yielded in total six predictors with a $p \leq 0.05$ (**Table 2**): *unemployment* ($B = -5.63$, $p = 0.047$), *financial problems* ($B = -9.85$, $p = 0.002$), *no or only little religious involvement* ($B = -4.31$, $p < 0.001$), *no psychiatric precontact* ($B = -7.19$, $p = 0.009$), *previous migration experiences* ($B = 7.87$, $p = 0.018$), and *perceived discrimination* ($B = 6.53$, $p = 0.025$). These variables were then included in a multiple linear regression model, whereby all variables kept statistical significance after applying the enter-method: *unemployment* ($B = -6.32$, $p = 0.014$), *financial problems* ($B = -10.71$, $p < 0.001$), *no or only little religious involvement* ($B = -3.23$, $p = 0.002$), *no psychiatric precontact* ($B = -7.35$, $p = 0.004$), *previous migration experiences* ($B = 8.76$, $p = 0.002$), and *perceived discrimination* ($B = 6.58$, $p = 0.011$). The final model, as displayed in **Table 3**, accounted for 18.7% of the BSI-GSI variance.

DISCUSSION

While some data on factors influencing the mental health of Asian migrants in the US, Canada, and Australia have been published, research in this area still lacks for Asians in Europe. Thus, the present study aimed to identify sociodemographic, clinical, and migration-surrounding risk-factors for mental distress among a cohort of Vietnamese migrants, who visited a psychiatric-psychotherapeutic outpatient clinic in the city of Berlin. Out of 22 initially considered candidate variables, the following five were found to be significantly related to the current level of experienced psychological distress: (1) *unemployment,* (2) *financial problems,* (3) *no or only little religious involvement,* (4) *no psychiatric precontact,* (5) *previous migration experiences*, and (6) *perceived discrimination.*

Consistent with studies on other migrant populations (25, 26), the factor *unemployment* was found to increase mental distress among Vietnamese migrants in Germany. On the one hand, unemployment is associated with numerous psychiatric complaints in different populations worldwide, not just in migrants (27). On the other hand, unemployment can be seen as a particular burden for migrants, when hindering them to socially integrate or gain permanent residency in the host country (25). Furthermore, unemployment often aggravates an already strained financial situation linked to the

TABLE 2 | Results of the three multiple regression models for sociodemographic, clinical, and migration-related predictors of the BSI-18 GSI.

Predictor	*B*[a]	SE[b]	β[c]	*t*[d]	*p*[e]	CI[f]
Model 1 (sociodemographic factors)						
Age	−0.113	0.11	−0.072	−0.99	0.337	−0.34; 0.11
Gender	−2.056	3.11	−0.044	−0.66	0.509	−8.19; 4.08
Marital status	1.365	2.73	0.036	0.50	0.618	−4.03; 6.76
Number of children	−0.037	1.13	−0.003	−0.03	0.974	−2.27; 2.20
Number of household members	−1.116	1.14	−0.079	−0.98	0.327	−3.36; 1.13
Years of education	−0.039	0.42	−0.006	−0.09	0.927	−0.88; 0.80
Occupational status	−5.632	2.82	−0.132	−2.00	0.047	−11.18; −0.82
Financial status	−9.848	3.17	−0.198	−3.17	0.002	−16.09; −3.60
Importance of religion	−4.311	1.14	−0.254	−3.77	< 0.001	−6.56; −2.06
Model 2 (clinical factors)						
Duration of persisting symptoms	0.022	0.03	0.047	0.72	0.475	−0.04; 0.08
Precontact to the psychiatry	−7.194	2.72	−0.175	−2.64	0.009	−12.55; −1.83
Past suicide attempts	4.253	4.41	0.064	0.97	0.336	−4.43; 12.94
Model 3 (migration-related factors)						
Age at migration	−0.083	0.14	−0.044	−0.61	0.543	−0.35; 0.18
Years lived in the host country	0.152	0.19	0.082	−0.79	0.432	−0.23; 0.53
Status of current residence	−4.640	2.73	−0.197	−1.99	0.067	−9.53; 0.47
German language skills	2.229	1.40	0.119	1.59	0.112	−0.53; 4.99
Feeling of being at home in Germany	1.846	2.97	0.044	0.62	0.835	−4.01; 7.71
Previous migration experiences	7.874	3.29	0.165	2.39	0.018	1.39; 14.36
Close connection to the home country	0.818	1.58	0.035	0.52	0.605	−2.29; 3.94
Perceived discrimination	6.534	2.89	0.160	2.26	0.025	0.84; 12.23
DSI (SMAS)	−0.008	0.19	−0.192	−0.43	0.671	−0.05; 0.03
ESI (SMAS)	0.004	0.19	0.097	0.22	0.829	−0.34; 0.04

[a]Unstandardized Beta-coefficient; [b]Standard error; [c]Standardized Beta-coefficient; [d]T-value; [e]p-value; [f]Confidence Interval (95%).

TABLE 3 | Multiple regression analysis for predictors of the BSI-18 GSI-score: final model after pre-analyses.

Predictor	*B*[a]	SE[b]	β[c]	*t*[d]	*p*[e]	CI[f]
Occupational status	−6.322	2.55	−0.150	−2.48	0.014	−11.35; −1.29
Financial status	−10.707	2.85	−0.226	−3.76	< 0.001	−16.32; −5.10
Importance of religion	−3.232	1.05	−0.190	−3.09	0.002	−5.29; −1.17
Precontact to the psychiatry	−7.354	2.51	−0.177	−2.93	0.004	−12.29; −2.41
Previous migration experiences	8.756	2.85	0.187	3.08	0.002	3.15; 14.36
Perceived discrimination	6.580	2.56	0.157	2.57	0.011	1.54; 11.62

[a]Unstandardized Beta-coefficient; [b]Standard error; [c]Standardized Beta-coefficient; [d]T-value; [e]p-value; [f]Confidence Interval (95%).

migration process. This, in turn, may produce additional distress since socioeconomic difficulties were reported continuously to cause mental problems in migrant (28) and non-migrant populations (29). Accordingly, the current study found a strong association between experienced *financial difficulties* and increased psychological distress. Especially for those Vietnamese who immigrated to Germany for economic reasons, the experience of ongoing financial pressure and insecurity may lead to a sense of hopelessness and reduced self-efficacy expectation. This condition was revealed to increase the severity of depression in one of our previous studies on this migrant group (19).

In line with studies on other migrant populations reporting a positive relationship between *religiosity* and mental health (30, 31), we found less psychiatric distress among religiously involved Vietnamese in Germany. Possible mechanisms are the evocation of positive emotions, the experience of purpose and meaning, the support from the religious community as well as the stress-buffering role of faith-based optimism. Therefore, in the frequently challenging context of migration, a lack or loss of the religious community may be conceptualized as the absence of an additional source of resilience. At the same time, however, studies have shown that stronger religious beliefs are correlated with negative attitudes toward psychiatry and psychiatrists in

TABLE 4 | Stressor-specific clinical recommendations.

Stressor	Clinical recommendation
Financial problems	• Financial problems may be especially demanding for those Vietnamese who migrated for economic reasons, because they might consider their migration-project to be failed • Clinicians should be able to inform about official offers to get help with economic problems • If currently not directly solvable, coping skills should be strengthened to relieve the patient and facilitate the subsequent treatment Therefore, resource- and empowerment-oriented psychotherapy appears appropriate for Vietnamese patients with socioeconomic difficulties
Unemployment	• Clinicians should be aware that unemployment is often accompanied by other problems, like social exclusion and self-doubts • Migrant-specific offers (language courses and specialized job training) should be pointed out • Occupational rehabilitation, as well as an occupational therapy approach is recommended for Vietnamese psychiatric patients
No or low religious involvement	• Mental health care providers should consider religiosity as a potential resource and include it in the clinical setting • At the same time, they should be aware of potential aggravating interferences between religiosity and the therapeutic process or the intake of medication
No psychiatric precontact	• Clinicians should be aware that even when the severity of mental distress elevates, this does not necessarily mean that the willingness to utilize mental health care services increases likewise • Therefore, at the first admission, the reasons for a potential delay in mental health care use should be thoroughly explored (e.g., concerns about shame and stigma, linguistic inappropriateness of services, cultural shaped concept of mental health which is inconsistent with Western forms of treatment) • Brief anti-stigma interventions should be implemented in order to minimize or even eliminate barriers in the future • Close cooperation between (preferably bilingual and bicultural) mental health care providers and community workers might help to reduce hurdles and to inform about consequences of a delayed help-seeking
Previous migration experiences	• Clinicians should pay attention to the complexity of migration experiences and migration ways • The diagnostic clarification should entitle a detailed history of migration, as well as a screening for pre-, post-, and peri-migration stressors
Perceived discrimination	• Clinicians should be aware that a Vietnamese psychiatric patient could have been the target of multiple discrimination: because of having a migration background *and* because of having mental problems • Clinicians should keep in mind that they have an exemplary role in how to validate and deal with mental problems adequately • Clinicians should be able to inform persons affected about anti-discrimination laws and local anti-discrimination agencies

India (32) and Vietnam (12) and could, therefore, lead to a reduced utilization of treatment facilities and offers (33). Hence, the positive effect of a psychiatric-psychotherapeutic treatment, as well as its compatibility with religious practices, should be discussed with engaged members of the religious communities (see recommendations in **Table 4**).

At first glance, our finding of less severe psychological impairment among Vietnamese with at least one *psychiatric precontact* may appear surprising, because studies on other populations have shown that the likelihood of mental health care utilization increases with the severity of psychiatric problems, such as major depression (34, 35). However, since psychiatric institutions are often negatively perceived among Vietnamese (12), a possible explanation might be, that patients who had no former contact with the mental health care system may seek help only in the case of severe distress, when it is perceived to be no longer manageable. This late utilization of psychiatric services was also found in the present sample, as symptoms lasted on average 23 months at the time of the first admission to the outpatient clinic. Patients with at least one previous contact with the mental health care system, in turn, could attend services earlier because of already having overcome their reluctance and being less afraid to use the respective facilities again. Such earlier access may then prevent the deterioration and chronicity of the symptoms by timely given therapeutic and psychopharmacological interventions.

One possible explanation for our finding of considerable more distress in the case of *previous migration experiences* is the phenomenon that on their way to Germany, many Vietnamese had a migratory "stop-over" in the former Eastern Bloc states (36). This often increased the complexity and duration of their migration process and, therefore, the probability of stressor-exposure. To give an example, Vietnamese migrants with several stops in different countries might be more often and for a longer time confronted with an uncertain residence status and the resulting fear of rejection than those who came to Germany directly (37). Therefore, our results suggest that multiple migration experiences may enlarge the stressor load and, thereby, as previous studies with Vietnamese in Germany (19) and Sweden (38) have shown, the risk for adjustment problems and mental distress such as depression.

Finally, the experience of interpersonal *discrimination* was found to be a major mental health risk-factor. Perceiving unfair treatment toward oneself or one's in-group represents a psychosocial stressor that is frequently related to poor psychological and physical health among migrant and non-migrant minority groups (39). Accordingly, studies on Vietnamese migrants in the US (40) and Europe (18) have documented a general decline in mental health under the influence of discrimination, but have also reported several moderators with the potential to reinforce or mitigate the negative impact of discrimination, such as social support (41) or the generational status (42). In addition, not only the effect of discrimination on mental health but also the perception of discrimination itself can be influenced by several characteristics, such as the current mood state (43) or the role of expectation (44). However, these methodological peculiarities notwithstanding, when dealing with Vietnamese migrants in the clinical setting, healthcare professionals should consider the migration background by screening for potential discriminatory experiences and other psychosocial stressors.

The factors *age, gender, marital status, number of children, number of household members, years of education, duration of persisting symptoms, past suicide attempt(s), age at migration, years lived in the host country, status of current residence, German language skills, feeling of being at home in Germany, close connection to the home country*, and the *two dimensions of acculturation* were not found to be significantly associated with the current level of experienced mental distress among our Vietnamese outpatient sample.

Regarding the factor *age*, most studies on other migrant populations have revealed a mental health advantage for younger (45) and disadvantage for older (46) migrants while the middle-aged frequently appear relatively unaffected. Therefore, concerning our Vietnamese sample, it cannot be entirely determined if age indeed was not a mental health key factor or if it has merely not unfolded its full effect since our participants were, on average, 45 years old and thus not part of any risk group. Regarding the factor *gender*, several studies have revealed a heightened mental health risk for female Vietnamese (45). However, some studies on other migrant populations have reported the opposite; for example, increased PTSD rates among male migrants in Finland (47). This underlies the general importance of this factor but also its variability with changing backgrounds.

The sociodemographic characteristics *marital status, number of children*, and *number of household members* were likewise not found to be among the most influential factors. However, they were revealed as crucial mental health determinants in the literature elsewhere (48). This may seem surprising at first sight since social contacts play an essential role within the Vietnamese value system (49) and their absence should, therefore, be a demanding condition for those being without a partner, children, or household members. However, since our sample was mainly comprised of Vietnamese living in Berlin, a city with a large and vibrant Vietnamese community, the lack of domestic contacts might be buffered or even compensated by the possibility to participate in overarching community networks and activities. Another explanation might be the increased use of social media, which enables migrants to stay in contact with distant friends and relatives, even when being less involved in the local community or living in a single-person household. Therefore, more research is needed to clarify how the role of domestic contacts is moderated by sociogeographical conditions and contact options via social media.

According to previous research, a higher *educational level* is often associated with improved mental health behavior (50). While most of the included Vietnamese patients indeed stated to have an intermediate or high-level Vietnamese school degree, the association mentioned above might not account for them because the concept of mental health (care) is still relatively new in Vietnam and might, therefore, not yet have found its way into the education system. Concerning the factor *language skills,* studies on Vietnamese (51) and other migrant populations (52) have confirmed a direct link between insufficient language proficiency and mental distress as well as an indirect link through a reduced mental healthcare use because of perceived language barriers (9). Although our present sample indeed displays deficient language skills, with over 55% rating their German language skills as "few" or "none," there was no sustainable effect on their subjective well-being. One reason might be that First Generation Vietnamese migrants in Germany were often found to stay within their communities, rendering a proficiency of German language skills less critical (53). Another reason might be that due to increased psychological distress, some respondents may not have been able to learn the host language properly, although there was a desire to do so.

In contrast to previous research, the present study did not find the migration-related characteristics *status of current residence* and *years lived in the host country* to be among the most influential mental health key factors. Regarding the latter aspect, studies have produced mixed findings with some of them reporting a constant improvement of mental health after the arrival (8) and some a decline (54), when after an initial "healthy migrant" effect subjective well-being decreases and adapts to that of the mainstream population. However, since nearly all of these studies have focused on the development of mental health within the first decade after migration, with regard to our present sample, expected effects might already have taken place or at least flattened out because our Vietnamese patients had already lived in Germany for an average of 16 years at the time of admission.

Finally, the migration-surrounding factors *feeling of being at home in Germany*, *close connection to the home country*, and the two *dimensions of acculturation* were likewise not found to be significantly associated with the current level of experienced mental distress. Concerning the latter factor, studies on the association between acculturation and psychological well-being have produced mixed findings depending on the particular mental health outcome and specific migrant population taking into consideration (55). Concerning Vietnamese migrants in Germany, one of our previous studies has reported a lower severity of depression (according to the BDI-II) among patients with both, an orientation toward the heritage and the mainstream society (12). The highest level of depressiveness, in turn, was found among patients with marginalization as acculturation strategy, who refuse to participate in both cultural communities. However, since the BDI-II focuses exclusively on the symptoms of depression, a possible explanation for not finding this connection in the current study could relate to the fact that the BSI-18 is not limited to depression, but also captures somatic complaints and symptoms of anxiety. Perhaps there is a particularly substantial overlap and clinical similarity between the appearance of depression and the characteristics of cultural detachment—insofar as, for example, social isolation can be a consequence of both states, depressiveness and cultural disengagement. Furthermore, a vicious circle would be conceivable when depression symptoms such as "loss of interest," "withdrawal," or "lack of motivation" additionally hamper the social exchange and thereby increase the impression of not being part of any cultural community. Consequently, more research is needed to further explore the role of acculturation by considering the depression scale independently from the other two BSI-18 dimensions.

Limitations and Future Research Directions

Despite its notable strengths, to be one of the very few and largest clinical investigations on Vietnamese migrants in Germany and the first to address a broad range of factors that are relevant for their mental health condition, our study has several limitations that have to be mentioned: (1) The outcome was limited to self-rated symptomatology. However, self-report questionnaires may encourage respondents from socio-centric cultures such as Vietnam to answer less in consideration of social-desirability because of perceived anonymity. (2) Our study design was cross-sectional. Thus, we cannot completely rule out that there was not only an influence of the candidate variables on the GSI, but also an effect of the respective psychiatric disorder on the rating of the variables. For example, the evaluation of the financial satisfaction or the perception of discrimination could have been distorted among depressed patients by what is known as the negative attention bias or (56) negative memory bias (57). This inverse causality is a common problem in cross-sectional research and must be taken into account when interpreting our results. (3) Our naturalistic study sample consisted of predominantly female participants (76.4%). Thus, the results of the present study are not generalizable without caution to other Vietnamese populations with different gender distributions. (4) Since there is no comprehensive framework specialized in Vietnamese migrants' mental health, we had to base our preselection of candidate variables on studies with factors that are generally relevant for the mental health of all Asian migrant populations. A selection-bias can, therefore, not entirely be ruled out.

Future research on factors being associated with the mental health of Vietnamese migrants should apply a longitudinal design and include a healthy (Vietnamese) control group as well as a mixed-method (quantitative and qualitative) approach to clarify further the pathway between psychological distress and its related predictors. Another question could focus on possible interactions among the identified stressors, for instance, how a psychiatric contact impacts mental health depending on the current role of religiosity. Finally, multiple-item scales as well as external assessment instruments, should be implemented to gain further information about potential risk-factors and their effects.

CONCLUSION

Out of 22 sociodemographic, clinically relevant, and migration-related candidate variables, the factors (1) *unemployment,* (2) *financial problems,* (3) *no or only little religious involvement,* (4) *no psychiatric precontact,* (5) *previous migration experiences,* and (6) *perceived discrimination* were revealed to be significantly associated with the current level of experienced psychological distress among Vietnamese migrants in Germany. Since migrants, in particular those with an Asian background, often underreport psychological complaints and underutilize mental health care services provided, the resulting population-specific risk-profile can help clinicians to identify candidates for psychiatric problems earlier and supply them with effective treatment options. Due to the cross-sectional design of the study, further research should apply a longitudinal as well as a mixed-method (quantitative and qualitative) approach to clarify further the pathway between psychological distress and its associated predictors.

DATA AVAILABILITY STATEMENT

Participants gave written informed consent to an anonymous use of the data collected for research purposes within the psychiatric outpatient clinic for Vietnamese migrants at the Charité – Universitätsmedizin, Campus Benjamin Franklin, Berlin, Germany. Therefore, following the written consensus of all participants, the de-identified raw data supporting the conclusions of this article will be made available by the authors to all researchers collaborating with the Department of Psychiatry, Charité – Universitätsmedizin Berlin, as well as upon request to those researchers with a scientific interest in using or re-using the de-identified raw data for conducting additional analyses.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the ethics review board of Charité – Universitätsmedizin Berlin (EA2/116/15). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

TMTT, EH, MD, AP, BH, MB, THN, VTN, and KW contributed to the study original conception and adaptation of the research design. TMTT translated all questionnaires. TMTT, EH, and MHN led most aspects concerning patients recruitment, data collection, and assessment, while THN did additional assessments of patients. MHN, SW, KB, EH, and TMTT conducted data analysis and interpretation. SW wrote the manuscript with support from TMTT, KB, KW, and EH. All authors commented and contributed to several versions until submission of the final manuscript during the review process and have seen and given final approval of the version to be published.

FUNDING

This study was supported by the German Research Foundation (DFG) and is part of the Collaborative Research Center 1171 Affective Societies—Dynamics of Living Together in Moving Worlds at Free University Berlin and Charité Universitätsmedizin Berlin (SFB 1171).

REFERENCES

1. Augsberger A, Yeung A, Dougher M, Hahm HC. Factors influencing the underutilization of mental health services among Asian American women with a history of depression and suicide. *BMC Health Serv Res.* (2015) 15:1–11. doi: 10.1186/s12913-015-1191-7
2. Kramer EJ, Kwong K, Lee E, Chung H. Cultural factors influencing the mental health of Asian Americans. *West J Med.* (2002) 176:227–31.

3. Takeuchi DT, Hong S, Gile K, Alegría M. Developmental context and mental disorders among Asian Americans. *Resour Hum Dev.* (2007) 4:1–19. doi: 10.1080/15427600701480998
4. Lai DWL, Surood S. Predictors of depression in aging South Asian Canadians. *J Cross Cult Gerontol.* (2008) 23:57–75. doi: 10.1007/s10823-007-9051-5
5. Islam F, Khanlou N, Tamim H. South Asian populations in Canada: Migration and mental health. *BMC Psychiatry.* (2014) 14:1–13. doi: 10.1186/1471-244X-14-154
6. Khera GS, Nakamura N. Substance use, gender, and generation status among Asian Indians in the United States. *J Ethn Subst Abuse.* (2016) 17:291–302. doi: 10.1080/15332640.2016.1201715
7. Altemus M, Sarvaiya N, Epperson CN. Sex differences in anxiety and depression clinical perspectives. *Front Neuroendocrinol.* (2014) 35:320–30. doi: 10.1016/j.yfrne.2014.05.004
8. Beiser M, Hou F. Language acquisition, unemployment and depressive disorder among Southeast Asian refugees: a 10-year study. *Soc Sci Med.* (2001) 53:1321–34. doi: 10.1016/S0277-9536(00)00412-3
9. Kang SY, Howard D, Kim J, Payne JS, Wilton L, Kim W, et al. English language proficiency and lifetime mental health service utilization in a national representative sample of Asian Americans in the USA. *J Public Health.* (2010) 32:431–9. doi: 10.1093/pubmed/fdq010
10. Blanch A. Integrating religion and spirituality in mental health: the promise and the challenge. *Psychiatr Rehabil J.* (2007) 30:251–60. doi: 10.2975/30.4.2007.251.260
11. Huang B, Appel HB, Ai AL, Lin CJ. religious involvement effects on mental health in Chinese Americans. *Asian Cult Hist.* (2011) 4:2–12. doi: 10.5539/ach.v4n1p2
12. Ta TMT, Böge K, Cao TD, Schomerus G, Nguyen TD, Dettling M, et al. Public attitudes towards psychiatrists in the metropolitan area of Hanoi, Vietnam. *Asian J Psychiatr.* (2018) 32:44–9. doi: 10.1016/j.ajp.2017.11.031
13. Nguyen MH, Hahn E, Wingenfeld K, Graef-Calliess IT, von Poser A, Stopsack M, et al. Acculturation and severity of depression among first-generation Vietnamese outpatients in Germany. *Int J Soc Psychiatry.* (2017) 63:708–16. doi: 10.1177/0020764017735140
14. Terry D, Ali M, Le Q. Asian migrants' lived experience and acculturation to Western health care in rural Tasmania. *Aust J Rural Health.* (2011) 19:318–23. doi: 10.1111/j.1440-1584.2011.01229.x
15. Ying YW, Han M. The longitudinal effect of intergenerational gap in acculturation on conflict and mental health in Southeast Asian American adolescents. *Am J Orthopsychiatry.* (2007) 77:61–6. doi: 10.1037/0002-9432.77.1.61
16. Carta MG, Bernal M, Hardoy MC, Haro-Abad JM, Report on the Mental Health in Europe Working Group. Migration and mental health in Europe (the state of the mental health in Europe working group: appendix 1). *Clin Pract Epidemiol Ment Health.* (2005) 1:13. doi: 10.1186/1745-0179-1-13
17. Federal Office of Statistics of Germany. *Anzahl der Ausländer in Deutschland nach Herkunftsland von 2017 bis 2019.* (2019). Available online at: https://de.statista.com/statistik/daten/studie/1221/umfrage/anzahl-der-auslaender-in-deutschland-nach-herkunftsland/
18. Merbach M, Wittig U, Brähler E. Angst und depression polnischer und vietnamesischer migrantinnen in leipzig unter besonderer berücksichtigung ihres eingliederungsprozesses [Anxiety and depression by polish and vietnamese migrants depending on their adoption process]. *Psychother Psychosom Medizinische Psychol.* (2008) 58:146–54. doi: 10.1055/s-2008-1067351
19. Wolf S, Hahn E, Dettling M, Nguyen MH, Wingenfeld K, Stingl M, et al. Migration-related stressors and their effect on the severity level and symptom pattern of depression among Vietnamese in Germany. *Depress Res Treat.* (2017) 2017:8930432. doi: 10.1155/2017/8930432
20. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavas P, Weiller E, et al. The mini-international neuropsychiatric interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry.* (1998) 59:22–33. doi: 10.1037/t18597-000
21. Spitzer C, Hammer S, Löwe B, Grabe HJ, Barnow S, Rose M, et al. Die kurzform des brief symptom inventory (BSI-18): erste befunde zu den psychometrischen kennwerten der deutschen Version [The short version of the brief symptom inventory (BSI-18): preliminary psychometric properties of the German translation]. *Fortschritte der Neurol Psychiatr.* (2011) 79:517–23. doi: 10.1055/s-0031-1281602
22. Brislin RW. Back-Translation for cross-cultural research. *J Cross Cult Psychol.* (1970) 1:185–216. doi: 10.1177/135910457000100301
23. Franke GH, Jaeger S, Glaesmer H, Barkmann C, Petrowski K, Braehler E. Psychometric analysis of the brief symptom inventory 18 (BSI-18) in a representative German sample. *BMC Med Res Methodol.* (2017) 17:1–7. doi: 10.1186/s12874-016-0283-3
24. Stephenson M. Development and validation of the stephenson multigroup acculturation scale (SMAS). *Psychol Assess.* (2000) 12:77–88. doi: 10.1037/1040-3590.12.1.77
25. Sidorchuk A, Engström K, Johnson CM, Kayser Leeoza N, Möller J. Employment status and psychological distress in a population-based cross-sectional study in Sweden: the impact of migration. *BMJ Open.* (2017) 7:14698. doi: 10.1136/bmjopen-2016-014698
26. Starace F, Mungai F, Sarti E, Addabbo T. Self-reported unemployment status and recession: an analysis on the Italian population with and without mental health problems. *PLoS ONE.* (2017) 12:e0174135. doi: 10.1371/journal.pone.0174135
27. Zhang S, Bhavsar V. Unemployment as a risk factor for mental illness: combining social and psychiatric literature. *Adv Appl Sociol.* (2013) 03:131–6. doi: 10.4236/aasoci.2013.32017
28. Tinghög P, Al-Saffar S, Carstensen J, Nordenfelt L. The association of immigrant- and non-immigrant-specific factors with mental ill health among immigrants in Sweden. *Int J Soc Psychiatry.* (2010) 56:74–93. doi: 10.1177/0020764008096163
29. Fryers T, Melzer D, Jenkins R, Brugha T. The distribution of the common mental disorders: social inequalities in Europe. *Clin Pract Epidemiol Ment Heal.* (2005) 1:1–12. doi: 10.1186/1745-0179-1-1
30. Arrey AE, Bilsen J, Lacor P, Deschepper R. Spirituality/religiosity: acultural and psychological resource among sub-saharan african migrant women with HIV/AIDS in Belgium. *PLoS ONE.* (2016) 11:e0159488. doi: 10.1371/journal.pone.0159488
31. Trilesnik B, Koch SC, Stompe T. Psychische gesundheit, akkulturation und religiosität bei jüdischen migranten aus der ehemaligen sowjetunion in österreich [Mental health, acculturation and religiosity in Jewish migrants from the former Soviet Union in Austria]. *Neuropsychiatrie.* (2018) 32:84–92. doi: 10.1007/s40211-018-0265-2
32. Mungee A, Zieger A, Schomerus G, Ta TMT, Dettling M, Angermeyer MC, et al. Attitude towards psychiatrists: a comparison between two metropolitan cities in India. *Asian J Psychiatr.* (2016) 22:140–4. doi: 10.1016/j.ajp.2016.06.014
33. Chaze F, Thomson MS, George U, Guruge S. Role of cultural beliefs, religion, and spirituality in mental health and/or service utilization among immigrants in Canada: a scoping review. *Can J Community Ment Heal.* (2015) 34:87–101. doi: 10.7870/cjcmh-2015-015
34. Hämäläinen J, Isometsä E, Laukkala T, Kaprio J, Poikolainen K, Heikkinen M, et al. Use of health services for major depressive episode in Finland. *J Affect Disord.* (2004) 79:105–12. doi: 10.1016/S0165-0327(02)00342-7
35. Boerema AM, ten Have M, Kleiboer A, de Graaf R, Nuyen J, Cuijpers P, et al. Demographic and need factors of early, delayed and no mental health care use in major depression: a prospective study. *BMC Psychiatry.* (2017) 17:18–21. doi: 10.1186/s12888-017-1531-8
36. Wolf B. Die vietnamesische Diaspora in Deutschland. *Struktur und Kooperationspotential mit Schwerpunkt auf Berlin und Hessen [The Vietnamese Diaspora in Germany. Structure and Potential for Cooperation With Focus on Berlin and Hessen].* Sonderheft des Bundesministeriums für Entwicklung (2007). Available online at: http://www.gtz.de/de/dokumente/de-vietnamesische-diaspora-2007.pdf
37. Yang M, Dijst M, Helbich M. Migration trajectories and their relationship to mental health among internal migrants in urban China: a sequence alignment approach. *Popul Space Place.* (2019) 26:e2304. doi: 10.1002/psp.2304
38. Johnsson E, Zolkowska K, McNeil TF. Prediction of adaptation difficulties by country of origin, cumulate psychosocial stressors and attitude toward integrating: a Swedish study of first-generation immigrants from Somalia, Vietnam and China. *Int J Soc Psychiatry.* (2015) 61:174–82. doi: 10.1177/0020764014537639

39. Hatch SL, Gazard B, Williams DR, Frissa S, Goodwin L, SELCoH Study Team, et al. Discrimination and common mental disorder among migrant and ethnic groups: findings from a South East London community sample. *Soc Psychiatry Psychiatr Epidemiol.* (2016) 51:689–701. doi: 10.1007/s00127-016-1191-x
40. Kim I, Keovisai M, Kim W, Richards-Desai S, Yalim AC. Trauma, discrimination, and psychological distress across Vietnamese refugees and immigrants: a life course perspective. *Community Ment Health J.* (2019) 55:385–93. doi: 10.1007/s10597-018-0268-2
41. Szaflarski M, Bauldry S. The effects of perceived discrimination on immigrant and refugee physical and mental health. *Adv Med Sociol.* (2019) 19:173–204. doi: 10.1108/S1057-629020190000019009
42. Takeuchi DT. NIH Public Access. Racial discrim psychol distress impact ethn identity age among immigr united states–born Asian adults. *Dev Psychol.* (2009) 44:787–800. doi: 10.1037/0012-1649.44.3.787
43. Sechrist GB, Swim JK, Mark MM. Mood as information in making attributions to discrimination. *Personal Soc Psychol Bull.* (2003) 29:524–31. doi: 10.1177/0146167202250922
44. Banerjee R. An examination of factors affecting perception of workplace discrimination. *J Labor Res.* (2008) 29:380–401. doi: 10.1007/s12122-008-9047-0
45. Liddell BJ, Chey T, Silove D, Phan TTB, Giao NM, Steel Z. Patterns of risk for anxiety-depression amongst Vietnamese-immigrants: a comparison with source and host populations. *BMC Psychiatry.* (2013) 13:329. doi: 10.1186/1471-244X-13-329
46. Dingoyan D, Schulz H, Kluge U, Penka S, Vardar A, von Wolff A, et al. Lifetime prevalence of mental disorders among first and second generation individuals with Turkish migration backgrounds in Germany. *BMC Psychiatry.* (2017) 17:1–14. doi: 10.1186/s12888-017-1333-z
47. Markkula N, Lehti V, Gissler M, Suvisaari J. Incidence and prevalence of mental disorders among immigrants and native Finns: a register-based study. *Soc Psychiatry Psychiatr Epidemiol.* (2017) 52:1523–40. doi: 10.1007/s00127-017-1432-7
48. Lecerof SS, Stafström M, Westerling R, Östergren PO. Does social capital protect mental health among migrants in Sweden? *Health Promot Int.* (2016) 31:644–52. doi: 10.1093/heapro/dav048
49. Hays J. Available online at: http://factsanddetails.com/southeast-asia/Vietnam/sub5_9c/entry-3389.html
50. Arendt JN. Does education cause better health? A panel data analysis using school reforms for identification. *Econ Educ Rev.* (2005) 24:149–60. doi: 10.1016/j.econedurev.2004.04.008
51. Brown C, Schale C, Nilson JE. Vietnamese immigrant and refugee women's mental health: an examination of age of arrival, lenght of stay, income and English language proficiency. *J Multicult Couns Devel.* (2010) 38:66–76. doi: 10.1002/j.2161-1912.2010.tb00115.x
52. Takeuchi DT, Zane N, Hong S, Chae DH, Gong F, Gee GC, et al. Immigration-related factors and mental disorders among Asian Americans. *Am J Public Health.* (2007) 97:84–90. doi: 10.2105/AJPH.2006.088401
53. Bösch F, Su PH. Invisible, successful, and divided Vietnamese in Germany since the late 1970s. *WIDER Working Paper 2018/15*. Helsinki (2018).
54. Liddell BJ, Nickerson A, Sartor L, Ivancic L, Bryant RA. The generational gap: mental disorder prevalence and disability amongst first and second generation immigrants in Australia. *J Psychiatr Res.* (2016) 83:103–11. doi: 10.1016/j.jpsychires.2016.08.011
55. Yoon E, Chang C-T, Kim S, Clawson A, Cleary SE, Hansen M, et al. A meta-analysis of acculturation/enculturation and mental health. *J Couns Psychol.* (2013) 60:15–30. doi: 10.1037/a0030652
56. Baert S, de Raedt R, Koster EHW. Depression-related attentional bias: the influence of symptom severity and symptom specificity. *Cogn Emot.* (2010) 24:1044–52. doi: 10.1080/02699930903043461
57. Urban EJ, Charles ST, Levine LJ, Almeida DM. Depression history and memory bias for specific daily emotions. *PLoS ONE.* (2018) 13:e0203574. doi: 10.1371/journal.pone.0203574

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.

frontiers in Public Health

ORIGINAL RESEARCH
published: 01 February 2021
doi: 10.3389/fpubh.2021.635474

A Central Clearing Clinic to Provide Mental Health Services for Refugees in Germany

Malek Bajbouj[1†], Patricia Panneck[2†], Sibylle-Maria Winter[3†], Carlos Ajami[1], Jihad Alabdullah[1], Max Benedikt Burger[1], Anja Haberlandner[3], Eric Hahn[1], Andreas Heinz[2], Isabella Heuser[1], Armin Hoyer[2], Ulrike Kluge[2], Marion Aichberger[2], Dimitris Repantis[1], Stefanie Schreiter[2], Joachim Seybold[4*†] and Igor Sutej[2†]

[1] Department of Psychiatry, Campus Benjamin Franklin, Charité – Universitätsmedizin Berlin, Berlin, Germany, [2] Department of Psychiatry, Campus Mitte, Charité – Universitätsmedizin Berlin, Berlin, Germany, [3] Department of Child and Adolescent Psychiatry, Campus Virchow Klinikum, Charité – Universitätsmedizin Berlin, Berlin, Germany, [4] Medical Directorate, Charité – Universitätsmedizin Berlin, Campus Mitte, Berlin, Germany

Edited by:
Patrik Roser,
Psychiatric Services
Aargau, Switzerland

Reviewed by:
Simone Grimm,
Medical School Berlin, Germany
Tobias Banaschewski,
University of Heidelberg, Germany

***Correspondence:**
Joachim Seybold
joachim.seybold@charite.de

† These authors have contributed equally to this work

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Public Health

Received: 30 November 2020
Accepted: 06 January 2021
Published: 01 February 2021

Citation:
Bajbouj M, Panneck P, Winter S-M, Ajami C, Alabdullah J, Benedikt Burger M, Haberlandner A, Hahn E, Heinz A, Heuser I, Hoyer A, Kluge U, Aichberger M, Repantis D, Schreiter S, Seybold J and Sutej I (2021) A Central Clearing Clinic to Provide Mental Health Services for Refugees in Germany. Front. Public Health 9:635474. doi: 10.3389/fpubh.2021.635474

Objective: To determine migration related distress pattern in refugees and feasibility of a *de novo* established, central low-threshold outpatient clinic serving more than 80,000 newly arrived refugees in the metropole of Berlin.

Methods: In an observational cohort study the relative prevalence of major psychiatric disorders by age, place of living within berlin, language and region of origin were assessed in a refugee cohort from 63 nationalities speaking 36 languages.

Findings: Within 18 months, a total of 3,096 cases with a mean age of 29.7 years (11.7) have been referred from all 12 districts and 165 of 182 subdistricts of Berlin to the CCC. 33.7% of the patients were female. The three most frequent diagnoses were unipolar depression (40.4%), posttraumatic stress disorder (24.3%), and adjustment disorder (19.6%).

Conclusion: The present data gives insight into the distribution of mental disorders in a large sample of refugees and provides evidence that a CCC is an effective service to quickly and broadly provide psychiatric consultations and thus to overcome classical barriers refugees usually experience in the host communities. In Berlin, Germany, and Europe treatment resources for this population should focus on stress and trauma related disorders.

Keywords: refugees, mental health, posttraumatic stress disorder, affective disorder, stress, migration health

INTRODUCTION

As a consequence of armed conflicts in embattled countries, more than sixty million people worldwide had been forced to leave their home countries according to recent UNHCR assessments (1). Although most forced migrants were seeking shelter in the countries directly neighboring the war regions, Central Europe has increasingly become one of the main destinations of larger transnational migration streams (2). As a consequence, since summer 2015 more than one million refugees have found their way to and stayed in Germany (3).

A large proportion of those refugees have witnessed the cruelties of civil war and experienced exceedingly stressful journeys to Central Europe. In addition, the process of resettlement in a novel environment with unfamiliar habits, norms and expectations, restrictive policies in regard to residence status, limited access to main stream health services, the lack of other basic infrastructures and the living conditions in provisional shelters all increase insecurity and uncertainty among the newcomers, often leading to ethnic discrimination and social exclusion (4). This in sum leads to an accumulation of emotional distress presumably resulting in increased prevalence rates of mental disorders within the group of refugees as compared to the general population (5–8). While the exact response pattern to stress and trauma experiences in this specific population after more than 2 years still remain unclear, it is beyond all questions that the overall demand in mental health services surmounted the capacities available within the existing German health care structures (9, 10).

Given the large number of potentially affected individuals, mental health stakeholders across Germany fiercely debate how the newcomers could best be provided access to a health care system, in which services of mental health care often are impeded by societal, individual, and structural barriers. Such barriers comprise the lack of knowledge about symptoms of mental disorders and treatment possibilities within the health care system and the still existing and widespread stigmatization of mental disorders. In addition to those general barriers, refugees experience further difficulties in form of language barriers and often culturally engrained different disease and treatment models (10–13).

Taken together, Germany faced a situation, in which a largely unprepared mental health care system needed to provide culture and trauma sensitive diagnostic and therapeutic procedures for a large number of refugees. As the health system was unable to bear this challenge without additional capacities, new mental health care models were needed to provide fast and low-threshold access to mental health care in order to diagnose, prioritize and treat refugees with mental disorders.

To address this need, we established in Berlin Germany's first central clearing clinic (CCC), an institution, in which refugees regardless of their legal and insurance status are seen at short notice. We here report results of the first six quarters of the CCC, in which the largest so far cohort of refugees ($n = 3.096$) in Germany underwent mental health screening.

METHODS

Study Population and Outreach Activities

In the time frame between February 10th 2016 and July 28th 2017 there had been a total of 4.635 contacts which have been aggregated to a total of 3.549 cases. From these a total of 453 cases have been excluded from further analysis because patients did not show up to complete the diagnostic procedure or the diagnosis remained unclear after two contacts.

All assessments were performed in the central clearing clinic, which is centrally located and situated in an area well-known to refugees since it hosted the registration authority for all newly arrived refugees in Berlin until May 2016.

All refugee housing facilities were informed about the availability of psychiatric services at the CCC on the day before opening (February 9th 2016). Additional outreach activities for refugee registration authorities, social workers, teachers, psychologists and volunteers working in the housing facilities were offered every 4 to 8 weeks providing information about the CCC and basic knowledge in culture-sensitive diagnosis and treatment of trauma and stress related symptoms.

This observational study was performed in accordance with International Conference on Harmonization Good Clinical Practice guidelines and the principles of the Declaration of Helsinki. The Charité ethics committee approved the protocol of this retrospective study.

Appointment Procedure and Psychiatric Assessment

Appointments were made via telephone and through email by social workers, volunteers, physicians, or by refugees themselves. A nurse with experience in mental health care made an initial estimate on case severity in order to adjust waiting time and give preference to the more severe cases to optimize resource allocation. There were also slots for immediate emergency contacts, for example for suicidal patients, after acute deterioration of symptoms or when the continuity of medication was crucial.

All psychiatric assessments were conducted by physicians experienced in transcultural psychiatry. The team of physicians consisted of two psychiatrists for adults, both working full time and one doctor for children and youth psychiatry who was working only part time at the CCC during 2016, but whose attendance was increased to a fulltime presence in 2017. Daily presence of at least one psychiatrist who spoke the most frequent language (Arabic) as a native language was ensured. Average assessment time was 1 h for adults and 90 min for children and adolescents. Some patients only had one single appointment. These cases either did not need further attendance or they were directly transferred to other institutions, such as outpatient clinics of psychiatric hospitals in Berlin. In other cases, follow up appointments at the CCC were scheduled to complete diagnostics or to offer further psychiatric support when referral could not be organized in a timely manner or for other reasons, lack of translators being the most common one.

At the CCC a range of the most commonly used psychiatric drugs was available on site. When physicians saw an indication to initiate pharmacological treatment, medication could directly be provided to the patients. Additionally, psychotherapeutic short-term interventions were offered as a group program to Farsi and Arabic speaking women.

Translation Techniques

Language barriers was addressed in three ways: (i) a native Arabic speaking physicians provided care for the bigger part of Arabic speaking patients; (ii) interpreters for the main languages (Arabic and Farsi/Dari) were present in the CCC all the time, and (iii) for other languages on-demand interpreters and/or

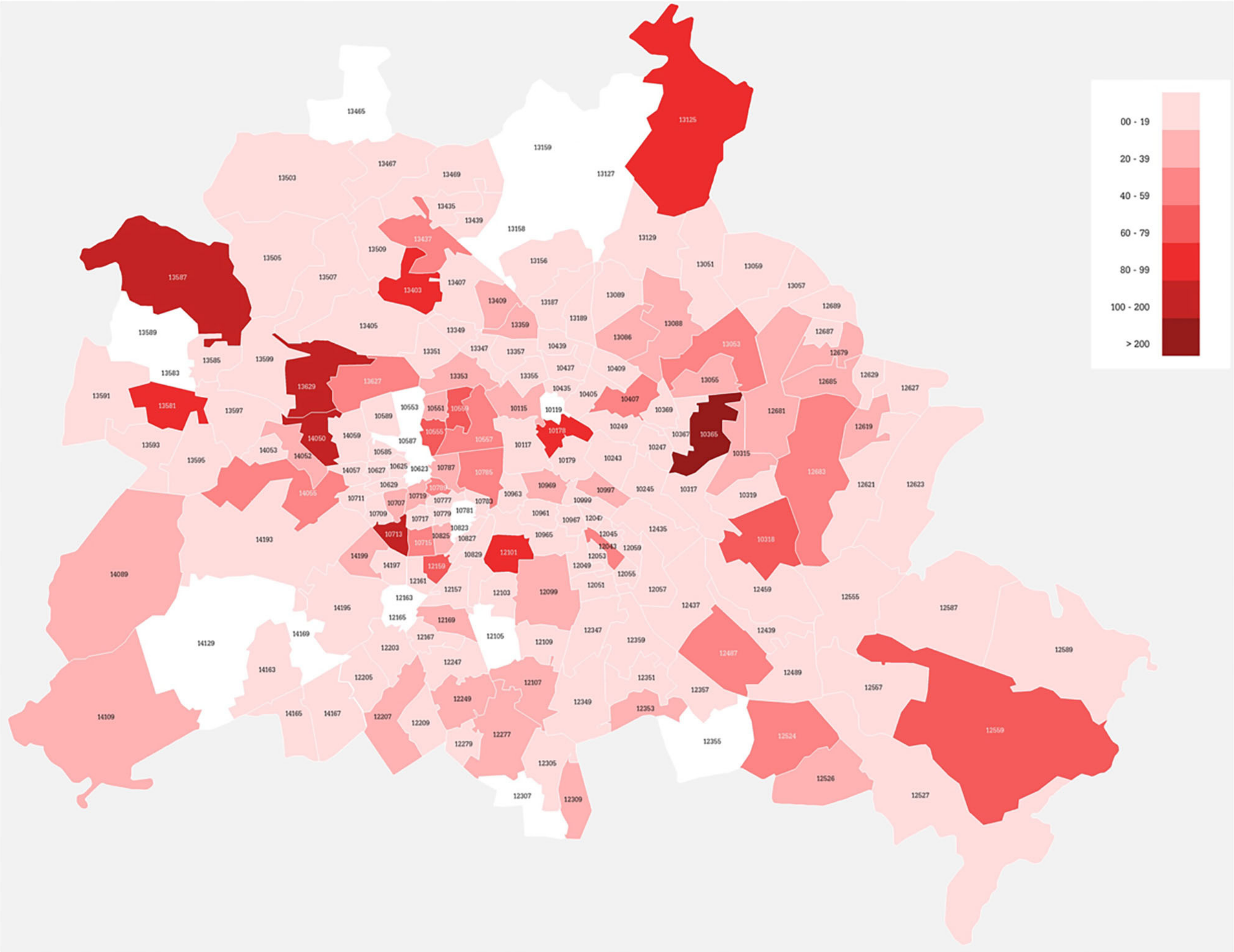


FIGURE 1 | Sub-districts within Berlin using the mental health services of the central clearing clinic (CCC) after 72 weeks. Coloring indicate the number of patients that have been sent to the CCC with darker colors indicating a high number and lighter colors a low number of patients. Please note that the services have been utilized by patients coming from 165 out of 182 subdistricts.

a video-based interpreter service was in use. These video-based consultations were conducted in front of a screen which connected a permanently available professional interpreter to psychiatrist and patient via audio and video. Although this medium certainly influenced the interaction the system was overall well-accepted by psychiatrists and patients.

Analysis

We described the diagnoses of refugees who have been referred to the CCC in the mentioned time frame. We reported distribution of clinical syndromes and disorders involved, by age and sex. Data were analyzed on SPSS 21.

RESULTS

Sociodemographic Data

Over 72 weeks (from February 10th 2016 to July 28th 2017) the CCC had a total of 4.635 contacts with 3.096 refugees (see **Supplementary Figure 1**) from all twelve districts and 165 out of 182 sub-districts of Berlin (see **Figure 1**). The investigated population consisted out of 2.052 male and 1.044 female refugees with a mean age of 29.7 years (SD 11.7). The age pattern significantly differed from the pattern of the general German population with a clear peak and focus in the age range between twenty and 40 years (see **Figure 2**). Seven Hundred Sixty two contacts (16.4%) and 542 patients (17.5%) referred to the CCC were younger than 18 years (see **Figure 2**). Further characteristics of the investigated population are shown in **Table 1**.

Clinical Data

The most frequent disorders were unipolar depression (40.4%), posttraumatic stress disorder (24.3%), and adjustment disorder (19.6%). Notably, in 7.4% of all patients referred to the CCC patients did not show any clinical syndrome which could have been classified according to DSM5 or

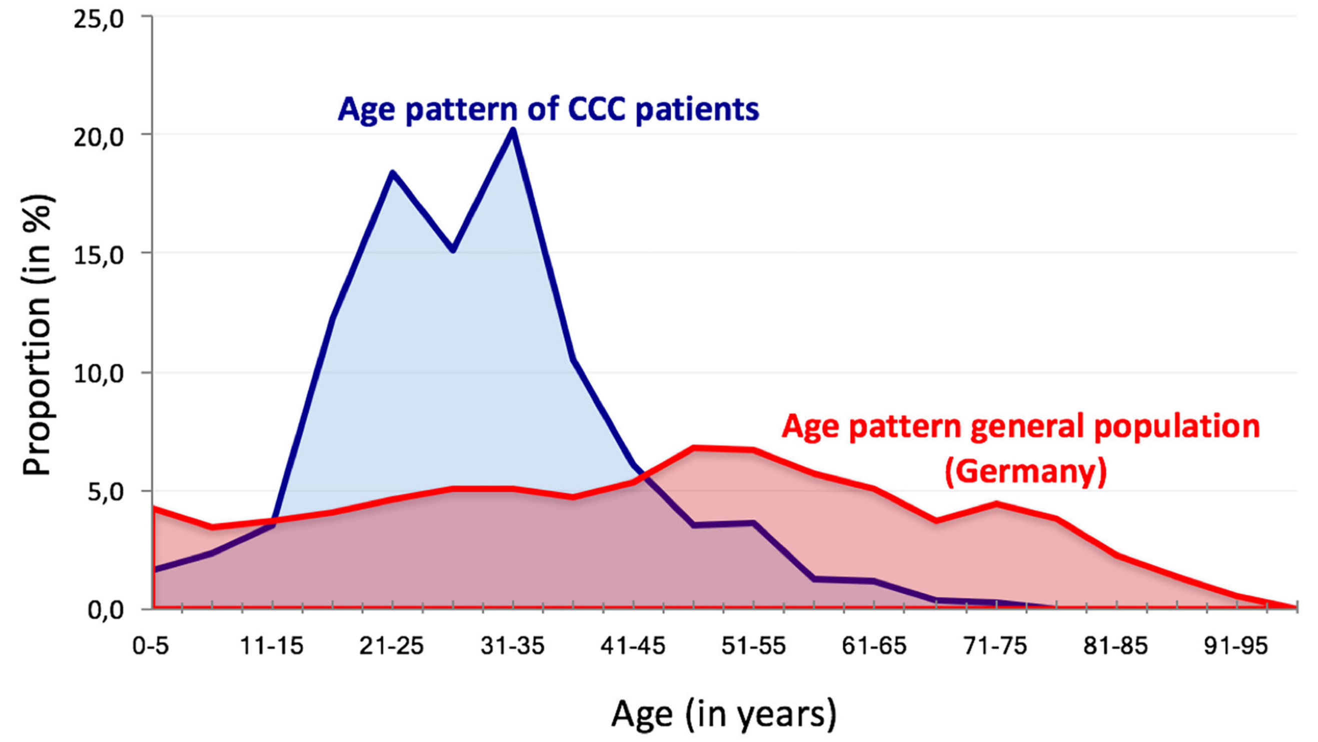


FIGURE 2 | Age pattern of the CCC patients compared to the general population in Germany.

TABLE 1 | Number of contacts and cases and basic sociodemographic data of the studied population of refugees.

		All	Male	Female	% Female
All	Contacts	4.635	3160	1.475	31.8
	Cases	3.096	2.052	1.044	33.7
	Mean age (SD)	29.7 (11.7)	27.9 (11.2)	32.4 (12.3)	–
Adults	Contacts	3.871	2.589	1.282	33.1
	Cases	2.554	1.638	916	35.8
	Mean age (SD)	32.6 (12.0)	31.0 (11.3)	35.0 (12.3)	–
Children and adolescents	Contacts	764	571	193	25.3
	Cases	542	414	128	23.6
	Mean age (SD)	13.1 (13.3)	13.7 (12.1)	11.2 (14.0)	–

ICD 10. Unipolar depression was more frequent in female refugees whereas addiction and psychotic syndromes were diagnosed more often in male refugees (further details in **Table 2**).

Discussion

Main results of the present investigation were (i) that a central clearing clinic is a feasible and probably superior institutional strategy to provide mental health care, and (ii) that stressful and traumatic life and flight experiences are associated with complex psychopathological reaction pattern with affective disorders, posttraumatic stress disorders and adjustment disorders being the most prominent disorders.

As a consequence of the steep rise of transnational migration Germany is becoming progressively ethno-culturally diverse, posing challenges for the countries' population and economy as well as for the refugees. This includes issues pertaining to the social and cultural inclusion of people into a receiving society, to social equality, education, labor market, democratic participation, social cohesion, and to the health care system. At the same time, the influx of people from ethnically and culturally heterogeneous backgrounds might spark progress toward an inclusive society benefiting from the variety of languages, cultural and ethnic diversity and the values and norms connected to it. More specifically, the challenges within healthcare comprise the availability of transculturally trained experts, techniques to overcome the language barrier and as a consequence the question whether the mental health care services should be provided in a centralized vs. a decentralized fashion.

Characteristics of the Central Clearing Point

Typical Western European mental health care institutions are usually not experienced in working with refugees from heterogeneous countries and cultures, who often present unfamiliar and diverse histories of mental disorders and traumata. Especially diagnostic evaluation of psychiatric disorders is associated with particular difficulties: different concepts of illness and mental health (13), varying expressions of

TABLE 2 | Total number of diagnoses in male and female refugees referred to the CCC between February 10th 2016 and July 27th 2017 (M, male; F, female).

		Unipolar DP	PTSD	Adjustment disorder	No pathology	Anxiety disorder	Addiction	Psychotic disorder	Bipolar disorder
All	*n*	1.249	753	607	229	142	140	137	24
	%	40.4	24.3	19.6	7.4	4.6	4.5	4.4	0.8
M	*n*	757	503	404	151	87	126	117	19
	%	36.9	24.5	19.7	7.4	4.2	6.1	5.7	0.9
F	*N*	492	249	203	78	55	14	20	5
	%	47.1	23.9	19.4	7.5	5.3	1.3	1.9	0.5
% F		39.3	33.1	33.4	34.1	38.7	10.0	14.6	20.8

psychological distress as well as a lack of acceptance and trust in an unknown health care system (13). Potential consequences are misdiagnoses, which might lead to delayed adequate treatment with significant emotional distress for the patient and their relatives as well as an additional financial burden to the health care system.

Additionally, the absence of professional interpreters is often an essential obstacle. Recent studies reveal that patients who face language barriers receive unfavorable medical care (14, 15). In order to prevent such negative consequences, the use of professional interpreters is highly needed (16–19). But often financial funding of interpreters is unclear and health care institutions have to face the additional high financial burden (20). The availability of professional interpreters, respective bilingual physicians was a major advantage of the CCC. The financial as well as the organizational burden could not have been carried out by the regular mental health care system. We saw patients of 36 different languages (**Supplementary Table 2**) with Arabic and Farsi being by far the most common languages.

By conceptualizing the CCC as a central access point located next to the central registration authority for refugees, we alleviated the access to mental health care. This centralized set up of the CCC counteracts the pre-existing organization of mental health care facilities in Berlin, which traditionally aim to provide supply in every district of the city. Those community based mental health services have the advantages of (i) being close to the homes of the patients and such being more accessible, (ii) facilitating the collaboration between psychiatrists/psychologists and social workers, institutions etc. of a respective district, (iii) setting clear responsibilities regarding the mental health care in Berlin, (iv) and enabling the inclusion in the regular health care system instead of developing parallel structures which may enhance barriers and exclusion on the long run.

A central clearing point contrasts this model, but have been broadly utilized from the refugee population (as indicated in **Figure 1**). A reason might be that the available general mental health services did not have the resources to provide sufficient care within an appropriate time span: the group of refugees was even after arrival in Berlin a highly mobile group. Often refugees had to move several times within Berlin from provisionary refugee camps to permanent housings. For many refugees, the CCC became a stable contact they could return to whilst having to make an odyssey through different accommodations and institutions during the first months in Germany.

Priorisation Strategies in Mental Health

Especially in those countries which have become the primary destination of migration of populations from civil war regions, the comparatively high trauma and stress load dares for novel solutions in the field of mental health addressing the need for a quick and substantial response and at the same time acknowledging the composition, threshold and extend of available resources within the traditional system.

Such solutions can be inspired from concepts of humanitarian aid (9) or emergency medicine, that usually address situations, in which a quick response is required in an environment with limited resources. In such settings, in which treatment resources are insufficient to treat all patients immediately, a priorisation system ("triage") is an effective approach to allot therapies efficiently. The concept, first described by Dominique Jean Larrey (19) during the Napoleonic Wars is nowadays a standard framework for many emergency medical services and a tool often used in mass-casualty incidents, e.g., in disaster medicine. Triage in this context refers to distinguishing between different levels of patients' needs and referring them to adequate treatment options, it does not exclude any patient from required treatment but rather helps to provide targeted interventions. Psychosocial and disaster behavioral health issues in situations affecting a large number of patients are used in broader concepts such as the continuous integrated care. However, triage concepts that exclusively address mental health services which are entrusted with decisions regarding the allocation of resource-intense therapies or in-patient treatments have rarely been implemented. The main considerations hindering such concepts is at first the general approach that every patient should be provided with the needed treatment as soon as possible regardless of the severity of the disorder. Second, unlike in emergency medicine, treatment decisions in most mental disorders happen rather on long-term considerations and often without an immediate life-threatening consequence making the implementation of a triage system more complex.

In the CCC we were able to proof that a priorisation system can be applied in mental health care. Advantages of the CCC were that with relatively little means it was possible to provide fast mental health care services to a larger population otherwise hard to access. This was indicated by the fact that patients were referred from all districts of Berlin. Even though they received an evaluation within a relatively short time span, the waiting time for appointments rather increased over the months which supports the high need for a mental health care contact point. While those patients that needed psychiatric care urgently could be identified faster and transferred to appropriate institutions for further treatment, less severe cases could also be identified and partly supported in the CCC, such unburdening the more specialized institutions and making more efficient use of the available resources such as specialized trauma therapies. By that, it was avoided that limited capacities were used ineffectively and immoderately. The needs for costly interventions were evaluated through psychiatrist with experience in intercultural work, ensuring that the indication was checked professionally.

Shortcomings of the CCC were that for those not in need of specialized treatments low-threshold interventions such as stress relief groups or support by social workers were not (yet) broadly available. To overcome this issue, we offered short term interventions in a group setting, which however were only available to a small group of our patients.

Pattern of Trauma and Stress Response in Refugees

So far, there is little evidence on the prevalence of mental disorders among refugees arriving in Germany in the last 3 years (20). The data from the CCC are corresponding to some extend with existing international data, showing an increased risk for depression and post-traumatic stress disorders in refugee populations compared to the general population (21, 22). In general, the rates of almost all psychiatric disorders diagnosed at the CCC show increased rates compared to the general German population (DEGS Study) (23). While comparing our findings to prevalence dates of the general German population one must take into account that our data relies on a preselected younger subpopulation as compared to the general population (see **Figure 2**). In consequence, disorders more prevalent in the population below 40 years are likely to be overrepresented. Of importance: as only cases that presented noticeable psychiatric problems were referred to the CCC, one must assume lower prevalence rates in the general refugee population. On the other hand, the data from the 3.096 included cases allow useful insights into the complexity of psychiatric disorders with a broad variety of clinical syndromes and suggest the need for further differentiated studies on the impact of refugee status and refugee living conditions as well as flight circumstances and discrimination experiences on the mental health status of the refugee population in Germany. Of importance, the finding that affective disorder, PTSD and adjustment disorder are the leading diagnoses support the current and future need for an increase in psychosocial and psychotherapeutic offers for refugees.

Limitations

However, we need to point out some difficulties and potential blurs of the preliminary data presented here: (i) diagnostic evaluation in the CCC was mainly based on clinical interviews. In order to respond to the huge demand and to keep the screening procedure feasible, we refrained from a systematic use of psychologic questionnaires, which were not available in all languages. (ii) In addition, reliability of our diagnostic evaluation therefore depended crucially on the quality of interpretation and may differ between e.g., Arabic native speaking psychiatrists and consultations conducted with interpreters. (iii) In the procedure of application for asylum, medical attestations become a certain form of informal currency that may influence chances of success. A lot of patients consulting in the CCC asked for medical attestations, in some cases this demands seemed to be the main reason for consultation. It was sometimes difficult to estimate how and to what extent this demand influenced the description of symptoms relevant for the diagnostic assessment. (iv) Moreover, the structure of the CCC leads to the fact that mainly the severe cases were referred and thus data are not representative of the refugee population, albeit the large sample size.

In conclusion, we were able to demonstrate that the concept of a central institution prioritizing mental health needs of individuals with a high stress and trauma load is feasible and – importantly- well-accepted. The CCC concept might be scalable and serve as a model for other settings where populations with a high stress load are coming into receiving countries with limited resources within the mental health care system. It may not only improve mental health of refugees but may also serve as an intervention against the frequently reported perception and experience of discrimination, that may further hamper the adaptation process for newcomers during resettlement (24, 25). To avoid exclusive health care structures, the current challenge is to integrate emergency services including translators into general mental health care and its local organization including service sectors and local networks of hospitals and outpatient services.

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 human participants were reviewed and approved by Charité ethics committee. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MB, PP, IS, JA, and JS analyzed the data and drafted the report. PP, CA, MBB, AHa, AHo, SS, and DR assisted in clinical case confirmation. AHe, S-MW, IH, MB, JS, EH, UK, and MA contributed to the methodology and study design. JS, IH, and AHe edited the drafted report. All authors contributed to the article and approved the submitted version.

FUNDING

This study was funded by the Berlin Office for Refugees, State of Berlin, Germany.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2021.635474/full#supplementary-material

REFERENCES

1. UNHCR. Global Trends. Forced displacement in 2015. Available online at: http://www.unhcr.org/576408cd7.pdf (accessed September 06, 2018).
2. Jefee-Bahloul H, Bajbouj M, Alabdullah J, Hassan G, Barkil-Oteo A. Mental health in Europe's Syrian refugee crisis. *Lancet Psychiatry.* (2016) 3:316–7. doi: 10.1016/S2215-0366(16)00014-6
3. Federal Office for Migration and Refugees. (2015). Migration Report. Available online at: http://www.bamf.de/SharedDocs/Anlagen/EN/Publikationen/Migrationsberichte/migrationsbericht-2015-zentrale-ergebnisse.html;jsessionid$=$A88F87C3F77085C6F44416B7B33C6FC8.2_cid286?nn$=$2006704 (accessed September 06, 2018).
4. Georgiadou E, Morawa E, Erim Y. High manifestations of mental distress in arabic asylum seekers accommodated in collective centers for refugees in Germany. *Int J Environ Res Public Health.* (2017) 14:E612. doi: 10.3390/ijerph14060612
5. Kluge U. Behandlung psychisch belasteter und traumatisierter asylsuchender und flüchtlinge - das Spannungsverhältnis zwischen therapeutischem und politischem Alltag. *Nervenheilkunde.* (2016) 35:385–90. doi: 10.1055/s-0037-1616401
6. Fazel M, Wheeler J, Danesh J. Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *Lancet.* (2005) 365:1309–1314. doi: 10.1016/S0140-6736(05)61027-6
7. Whitsett D, Sherman MF. Do resettlement variables predict psychiatric treatment outcomes in a sample of asylum-seeking survivors of torture? *Int J Soc Psychiatry.* (2017) 63:674–85. doi: 10.1177/0020764017727022
8. Porter M, Haslam N. Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: a meta-analysis. *JAMA.* (2005) 294:602–12. doi: 10.1001/jama.294.5.602
9. Bajbouj M, Alabdullah J, Ahmad S, Schidem S, Zellmann H, Schneider F, et al. Psychosocial care of refugees in Germany : insights from the emergency relief and development aid. *Nervenarzt.* (2018) 89:1–7. doi: 10.1007/s00115-017-0326-y
10. Abbott A. The mental-health crisis among migrants. *Nature.* (2016) 538:158–60. doi: 10.1038/538158a
11. Kluge U, Bogic M, Devillé W, Greacen T, Dauvrin M, Dias S, et al. Health services and the treatment of immigrants: data on service use, interpreting services and immigrant staff members in services across Europe. *Eur Psychiatry.* (2012) 27:56–62. doi: 10.1016/S0924-9338(12)75709-7
12. Sandhu S, Bjerre NV, Dauvrin M, Dias S, Gaddini A, Greacen T, et al. Experiences with treating immigrants: a qualitative study in mental health services across 16 European countries. *Soc Psychiatry Psychiatr Epidemiol.* (2013) 48:105–16. doi: 10.1007/s00127-012-0528-3
13. Vardar A, Kluge U, Penka S. How to express mental health problems: Turkish immigrants in Berlin compared to native Germans in Berlin and Turks in Istanbul. *Eur Psychiatry.* (2012) 27:50–5. doi: 10.1016/S0924-9338(12)75708-5
14. Flores G, Laws MB, Mayo SJ, Zuckerman B, Abreu M, Medina L, et al. Errors in medical interpretation and their potential clinical consequences in pediatric encounters. *Pediatrics.* (2003) 111:6–14. doi: 10.1542/peds.111.1.6
15. Fiscella K, Franks P, Doescher MP, Saver Bg. Disparities in health care by race, ethnicity, and language among the insured: findings from a national sample. *Med Care.* (2002) 40:52–9. doi: 10.1097/00005650-200201000-00007
16. Divi C, Koss RG, Schmaltz SP, Loeb JM. Language proficiency and adverse events in US hospitals: a pilot study. *Int J Qual Health Care.* (2007) 19:60–7. doi: 10.1093/intqhc/mzl069
17. Derose KP, Baker DW. Limited English proficiency and Latinos' use of physician services. *Med Care Res Rev.* (2000) 57:76–91. doi: 10.1177/107755870005700105
18. Baarnhielm S, Aberg-Wistedt A, Rosso MS. Revising psychiatric diagnostic categorisation of immigrant patients after using the Cultural Formulation in DSM-IV. *Transcult Psychiatry.* (2014) 52:287–310. doi: 10.1177/1363461514560657
19. Skandalakis PN, Lainas P, Zoras O, Skandalakis JE, Mirilas P. To afford the wounded speedy assistance": Dominique Jean Larrey and Napoleon. *World J Surg.* (2006) 30:1392–9. doi: 10.1007/s00268-005-0436-8
20. Richter K, Lehfeld H, Niklewski G. Waiting for asylum: psychiatric diagnosis in bavarian admission center. *Gesundheitswesen.* (2015) 77:834–8. doi: 10.1055/s-0035-1564075
21. Lindert J, Ehrenstein OS, Priebe S, Mielck A, Brähler E. Depression and anxiety in labor migrants and refugees–a systematic review and meta-analysis. *Soc Sci Med.* (2009) 69:246–57. doi: 10.1016/j.socscimed.2009.04.032
22. Hansson EK, Tuck A, Lurie S, McKenzie K. Rates of mental illness and suicidality in immigrant, refugee, ethnocultural, and racialized groups in Canada: a review of the literature. *Can J Psychiatry.* (2012) 57:111–21. doi: 10.1177/070674371205700208
23. Goeßwald A, Lange M, Kamtsiuris P, Kurth BM. DEGS: studie zur gesundheit erwachsener in Deutschland. *Bundesgesundheitsbl.* (2012) 55:775–80. doi: 10.1007/s00103-012-1498-z
24. Ataca B, Berry J. Psychological, sociocultural, and marital adaptation of Turkish immigrant couples in Canada. *Int J Psychol.* (2012) 37:13–26. doi: 10.1080/00207590143000135
25. Schreiter S, Winkler J, Bretz J, Schouler-Ocak M. What do Interpreters Cost? – A Retrospective Analysis of the Costs for Interpreters in Treatment of Refugees in a Psychiatric Outpatient Clinic in Berlin. *Psychother Psychosom Medizinische Psychol.* (2016) 66:356–60. doi: 10.1055/s-0042-115414

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.

frontiers
in Psychiatry

ORIGINAL RESEARCH
published: 01 February 2021
doi: 10.3389/fpsyt.2021.595979

Faith-Based Coping Among Arabic-Speaking Refugees Seeking Mental Health Services in Berlin, Germany: An Exploratory Qualitative Study

*Diana Rayes[1,2], Carine Karnouk[1], Dana Churbaji[3], Lena Walther[1] and Malek Bajbouj[1]**

[1] Department of Psychiatry and Psychotherapy, Charité University Medicine Berlin, Berlin, Germany, [2] Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, United States, [3] Institute of Psychology, University of Münster, Münster, Germany

Background: The benefits of faith-based coping or using religious and spiritual beliefs as a stabilizing force for interpreting stressful or distressing events are largely unexplored among the exodus of Arabic-speaking refugee populations from Muslim-majority countries, particularly those resettled in Europe. The present study aimed to explore the manifestation of faith-based coping strategies among Arabic-speaking refugee adults seeking mental healthcare services in Berlin, Germany and explore how favorable faith-based coping strategies can be optimized from a mental health service-delivery and broader integration perspective.

Methods: A total of 17 qualitative interviews were conducted with Arabic-speaking refugee adults (six females, 11 males) seeking mental health services at the Charité Universitaetsmedizin in Berlin. Research questions aimed to solicit comprehensive perspectives from refugee adults on their mental health, with an emphasis on faith-based coping, and how this facilitated or impeded their integration into German society. Interview transcripts were translated to English from Arabic and analyzed using MAXQDA (2018) to highlight thematic patterns using a grounded theory approach.

Results: Findings were structured into four themes, including: (I) faith-based coping methods during flight, (II) changes in faith practices upon arrival, (III) faith-based coping methods to address distress during integration, and (IV) advice for German mental healthcare providers. Participants who demonstrated a stronger commitment to faith were more likely to utilize faith-based coping strategies when seeking mental health services and facing the challenges of displacement and integration. Examples of faith-based coping included prayer, supplication, reciting scripture, and seeking help from a local religious leader.

Conclusion: The findings suggest how faith and faith practices play a significant role in the mental health and integration of refugee populations in Germany and provide insight on how mental healthcare can be delivered in a culturally-sensitive manner, providing alternatives to the social, cultural, and linguistic barriers posed by the German health

Edited by:
Wulf Rössler,
Charité – Universitätsmedizin Berlin, Germany

Reviewed by:
Sophie Yohani,
University of Alberta, Canada
Ali Abbas Samaha,
Lebanese International University, Lebanon

***Correspondence:**
Malek Bajbouj
malek.bajbouj@charite.de

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *18 August 2020*
Accepted: *04 January 2021*
Published: *01 February 2021*

Citation:
Rayes D, Karnouk C, Churbaji D, Walther L and Bajbouj M (2021) Faith-Based Coping Among Arabic-Speaking Refugees Seeking Mental Health Services in Berlin, Germany: An Exploratory Qualitative Study. Front. Psychiatry 12:595979. doi: 10.3389/fpsyt.2021.595979

system. These findings are particularly relevant for mental health professionals, non-governmental organizations, and humanitarian aid agencies providing mental healthcare to Arabic-speaking populations recently resettled in Western contexts.

Keywords: asylum-seekers, refugees, Muslim, faith-based coping, integration, mental health, Germany

INTRODUCTION

As host countries continue to grapple with how to best integrate recently arrived refugees and asylum-seekers into their societies, the influence of faith, including religious or spiritual beliefs and practices, on refugee mental health and well-being remain largely unexplored. Refugees fleeing conflict arrive in foreign countries having experienced the effects of war, shock, upheaval, and the psychological burden of their journeys (1). Studies in Germany suggest that over 40% of refugees and asylum-seekers who have arrived since 2013 show signs of a mental disorder, a quarter of them with diagnosable post-traumatic stress disorder, anxiety, or depression (2–5). This distress is often exacerbated upon arriving to a new host country given various social, economic, and legal barriers imposed on refugees and asylum-seekers (5, 6). Recent studies also report high prevalence rates of up to 75% of mental distress among Syrian refugees resettled in Germany and an increased risk among refugees for developing a severe mental illness in comparison to the host population (7, 8). Language barriers, culture shock, and lack of economic opportunities (9) further discourage refugee populations from engaging with host communities and therefore, delay or inhibit successful integration.

Among the many European countries hosting refugees, Germany has played a vital role in the future of many – receiving nearly one million refugees from Syria, Afghanistan, and Iraq in 2015 alone (10). Since then, Germany has seen the arrival of more refugees and asylum-seekers than any other European country (11). The large influx of refugees to Europe from Muslim-majority countries has inevitably led to a sharp rise in the number of Muslims in Germany (12). Predictions by the Pew Research Center indicate that even with no future net migration, Muslims in Germany will represent 9% of the population by 2050 (13). The sharp rise in numbers of Muslims in Germany has inevitably led to a significant shift in the sociopolitical landscape within Germany and in Europe. This has partly led to the growing influence of populist and nationalist groups with anti-immigration policy agendas, provoking fear of the Muslim threat to Germany's social and religious cohesion (14–16). In addition, discrimination and stereotyping of migrant populations, particularly those from Muslim-majority countries, is often propagated by negative media coverage and misinformation campaigns by the same groups and can lead to feelings of discrimination or isolation (9, 17). This can potentially exacerbate psychological symptoms, leading to isolation and alienation, and further complicate the integration process for refugee communities, particularly those from Muslim-majority countries (18).

More recently, there has been more emphasis on the provision of culturally-sensitive mental health services to refugees and asylum-seekers, especially those fleeing from conflict or those who have experienced political or religious persecution in their country of origin (19). This includes the adaptation of existing mental health and psychosocial support services to be more accessible in different languages and ensure that mental health professionals are aware of various social norms and dynamics that exist within a particular cultural group (20). Coping methods, or efforts made by individuals to manage or overcome their psychosocial distress, can also vary across different cultures. For example, refugee populations usually rely on a social pyramid of family and close friends for support – one that might not exist anymore due to displacement, separation, and the loss of loved ones during conflict (21). With this knowledge, mental health professionals can help their refugee clients identify other forms of social support, including cultural, religious, or diaspora networks, which can help newcomers navigate their new environment and cope with the sudden changes following displacement (20, 22).

Within the umbrella of providing culturally-sensitive mental healthcare, there is a small, yet growing body of evidence on the benefits of faith-based coping, or using religious or spiritual beliefs as a stabilizing force for interpreting traumatic events (23, 24). For example, a review published by UNHCR emphasized the diversity of faith-based coping methods utilized by Syrian refugees from various faiths suffering from mental health problems (20). This includes reading Quranic or verses from scripture, making prayers or supplication, seeking treatment from a religious cleric or traditional healer to keep away *jinn* or evil, or visiting holy sites or completing *hajj* or Islamic pilgrimage. Similar coping methods have been demonstrated by studies regarding Syrian refugee adults resettled in the United States (25) and Somali refugee women in Australia, who reported that daily prayers required by their Islamic faith to be a source of comfort and solace during bouts of depression and loneliness in their new home (26).

Despite the significant implications of these findings for mental health policy and practice, faith-based coping strategies among refugee populations seeking specialized mental health services remain largely unexplored, particularly for those living in Germany and in Europe more broadly. The objectives of this qualitative study were to explore the manifestation of faith-based coping strategies among Arabic-speaking refugee adults seeking mental healthcare services in Berlin, Germany and explore how favorable faith-based coping strategies can be optimized from a mental health service-delivery and broader integration perspective.

MATERIALS AND METHODS

Study Sample

This research was a sub-study of the Mental Health in Refugees and Asylum-Seekers (MEHIRA) project, led by the Charité Universitaetsmedizin Berlin (19, 27). The MEHIRA project is a multi-center randomized controlled trial aimed to investigate the effects of a stepped and collaborative care model (SCCM) for refugee and asylum-seekers suffering from mental health issues in Germany. The study aimed to explore how mental health care can be delivered in a culturally-sensitive manner. This was done by exploring alternatives to the social, cultural, and linguistic barriers posed by the German health system by providing healthcare in the same language as the client, or by a healthcare provider from the same cultural background. Study participants were recruited from the larger MEHIRA study sample, which included adults who were (i) between the age of 18 and 65 (ii) demonstrated no symptoms of neurodegenerative disorder, psychotic disorder, or suicidal ideation (iii) had refugee or asylum-seeker status in Germany (iv) spoke either Arabic or Farsi.

From among the MEHIRA participants, this study sample was limited to Arabic-speaking refugee and asylum-seeker adults seeking care at the Central Clearing Clinic sponsored by the Charité Universitaetsmedizin Berlin. After completing the initial MEHIRA baseline data collection process, including demographics and a number of questionnaires to assess overall psychological well-being (determined via a score of $\geq$12 on items 1–14 or $\geq$5 item 15 in the Refugee Health Screener-15, and "several days" or higher in a minimum of three responses in the Patient Health Questionnaire-9), participants were invited to take part in an anonymous interview designed to further solicit their perspectives regarding the importance of their faith to promote well-being and prevent mental illness.

Participants were purposively sampled from among the MEHIRA study population to include a variety of age and gender groups with demonstrated interest in participating in the qualitative study following their baseline assessment. For more information, please refer to the complete MEHIRA study protocol available in (19).

Data Collection

A semi-structured interview guide (**Appendix A**) with 19 questions was designed using a grounded theory approach to contextualize questions of mental health and faith-based coping within a comprehensive backdrop of the participant's lived experience (28). This included questions regarding the nature of the war and conflict they fled back home, the experience of their displacement journey, and current challenges faced or experienced following their arrival to Germany in order to illustrate the chronology of mental health symptoms or illness. **Supplementary Information** regarding aspects of their personal lives, including their family, upbringing, traditions, and cultural practices were also included to elicit a narratives (28). To explore links between mental health, concepts of the self, and faith, questions regarding general coping methods and religious background were adapted from the HOPE Approach to Spiritual Assessment. This included questions about general sources of hope, meaning, comfort, and peace, as well as standard questions regarding the importance of organized religion in the lives of participants and extent of practices that are helpful to the participant (29).

Informed consent was provided by participants before initiating data collection. All interviews took place in a private setting within a mental health clinic in central Berlin between December 2018 and April 2019. Interviews were audio-recorded following the consent of the participants. All interviews were conducted in Arabic by a native Arabic speaker with a psychology background and public health research training (DR). Interviews were simultaneously transcribed and translated to English. *In vivo* codes, including Arabic terms and phrases used to describe culturally specific symptoms or methods of coping were transliterated to English for later inclusion in the results. On average, interviews lasted 36.5 min.

Qualitative Analysis

The interviews were anonymized, transcribed, and entered to MAXQDA (20.0.8) in English to code and categorize the data into relevant themes using a grounded theory approach (28). Based on this framework, line-by-line coding by DR (also the primary interviewer) was completed in order to comprehensively reexamine the data collected. Codes were then initially organized by topics listed in the interview guide, including challenges, general coping methods, examples of faith-based coping, to facilitate the coding of complex perspectives shared by participants regarding mental health, concepts of the self (including experience of displacement), and faith. Code categories were later expanded based on emerging ideas that were compiled at the end of each interview in order to explore unexpected themes or corroborate certain ideas or responses shared by other participants in subsequent interviews. Interpretation of emerging ideas was triangulated among three of the authors to ensure accuracy. This included codes regarding coping strategies before, during, and after displacement, seeking mental health support from a spiritual leader, impact of integration on faith practices, and advice to mental health professionals.

For the analysis and compilation of themes, a top-down approach was used for targeted interview questions (such as "For some people, their religious or spiritual beliefs act as a source of comfort and strength in dealing with life's ups and downs; is this true for you? If yes, how? If no, was it ever?") to develop concise, yet comprehensive categories. This led to the development of themes regarding faith-based coping methods utilized before, during, and after displacement, as well as advice for German mental health providers. For more general interview questions (such as "What are your sources of hope, strength, comfort, and peace?"), a bottom-up analysis approach was used to develop important themes based on cultural and religious coping methods demonstrated across the study population, including changes in faith practices upon arrival and integration.

TABLE 1 | Participant sociodemographics and clinical data.

No.	Country of Origin	Religion	Months in Germany	RHS Score*	PHQ-9 Score*	Reasons for Migration
1	Syria	Islam	15	21	13	War, individual, social
2	Syria	Islam	38	29	17	War, economic
3	Syria	Islam	29	32	17	War, individual
4	Syria	Islam	39	17	10	War, political, religious persecution
5	Syria	Islam	44	36	10	War, political, religious persecution
6	Iraq	Islam	8	37	15	Economic, social, political, and religious persecution
7	Iraq	Islam	21	38	17	War (Syria), political and religious persecution (Iraq)
8	Iraq	Islam	35	41	21	Political and religious persecution
9	Iraq	Islam	37	32	18	War, political situation, religious persecution. social
10	Syria	Islam	31	44	25	War, social
11	Iraq	Islam	47	43	23	War, political and religious persecution
12	Syria	Islam	39	20	19	War
13	Syria	Islam	24	35	16	War, economic, individual, political and religious persecution, social
14	Syria	Islam	31	17	7	Individual, social
15	Syria	Islam	21	24	10	War, individual
16	Syria	Islam	28	30	25	War, economic, social
17	Syria	Islam	44	33	21	War, individual, political and religious persecution

**Scores of ≥12 on items 1–14 or ≥5 item 15 in the Refugee Health Screener-15 and "several days" or higher in a minimum of three responses the Patient Health Questionnaire-9 indicated psychological distress.*

TABLE 2 | Summary of participant age and gender breakdown.

Gender	
Males	11
Females	6
Age	
20–29	8
30–39	4
40–49	5

Ethical Approval

The study was conducted as a part of the larger MEHIRA project, which was approved by the Ethical Committee of the Charité Universitaetsmedizin Berlin. The study was registered in ClinicalTrials.gov (registration number: NCT03109028; registration date 11.04.2017). As exhibiting symptoms of depression or psychological distress was an inclusion criterion for this study, particular approaches were taken to ensure the comfort of the participant before, during, and after the interview. This included taking note of the general affect of the participant throughout the interview, including tone of voice, bodily gestures, and facial expressions, in order to take any potential steps to stop or halt the interview if the participant became upset or uncomfortable. Before the interview, it was noted whether or not the participant had an appointment in the clinic before or after the interview in order to prevent any delays or interview fatigue. Referrals to mental health professionals working in the clinic were available for support and supervision in the event that it was needed.

RESULTS

Participants

A total of 17 participants (11 male; six female) were interviewed for the study (see **Table 1**). Participants were between the ages of 22 and 47 years old, with an average age of 34.7 (see **Table 2**). The majority of participants were originally from Syria ($N = 12$), followed by Iraq ($N = 5$). A total of 6 participants were married, five were divorced or separated, five were single, and one was widowed. Nine participants had at least one child. On average, participants had been in Germany for 2 years and 3 months (ranging between 8 and 47 months) and had completed 10.4 years of schooling. Reasons for migration varied among participants; however, most had fled ongoing war and conflict in their countries of origin, as well as political or religious persecution. All participants had temporary residency status except for one participant who was residing in Germany without a legal residence permit. A total of eight participants lived in private apartments, followed by seven participants who lived in refugee accommodation centers, and two participants who lived in shared flats. All participants identified as Muslims, and two identified as non-religious (or non-practicing) Muslims.

Themes

The main findings from the interviews were organized into four themes including, (I) faith-based coping during flight (II) changes in faith practices upon arrival (III) faith-based coping during integration, and (IV) advice for mental health providers. The first two themes capture an overview of general coping strategies in line with ongoing challenges and shifts in faith and faith practices experienced by participants upon arrival to Germany, and for the latter themes they provided examples of faith-based coping methods and how they can be incorporated into mental health care provided by non-Arab or non-Muslim mental health providers.

Faith-Based Coping During Flight

Participants provided examples of faith-based coping methods they utilized throughout their migration journey and after witnessing war and conflict in countries of origin. Among participants from Syria, these experiences were particularly acute since many had fled shortly following the onset of violence, experienced abrupt interruptions to schooling and livelihoods, witnessed the arrival of armed groups and were exposed to death or detention. Participants from Iraq described more protracted migration experiences, including living through multiple generations of war throughout childhood, experiencing long-term separation from family and children, and cited multiple experiences of displacement from Iraq.

Examples of faith-based coping methods were reported among participants who endured difficult or challenging displacement journeys, such as those who crossed multiple countries and borders to arrive to Germany, placing their families at risk in the process. One participant from Iraq shared:

> *Once we took off by boat on the ocean, I asked God, "If I have a place in this world, let me and my entire family" to arrive. If you have written for someone in my family to drown, let me drown in their place. I hope I arrive to Germany in peace and safety. And if that anything was going to happen, it would be me instead of someone in my family.*

Two participants from Iraq also mentioned the importance of thanking God during or after the end of the journeys they endured by sea and foot to arrive to Germany:

> *I said to myself, once I arrive, I will pray about 20 rakat* (supplications) *for God once we arrive to Germany. When I arrived to Germany, after about 10 days, I had a dream where God asked me, "Why did you not pray?" I felt someone was holding me accountable, why didn't you pray as promised? This was the first time something like this ever happened to me.*

Changes in Faith Practices Upon Arrival

Displacement to Germany resulted in processes of reflection among participants, who found that they had the opportunity, for the first time, to reflect on their personal beliefs and become more "open" to new perspectives and experiences that were not available in their country of origin. Upon displacement, participants reported that the cultural and religious disparity between Arab and German cultures made young refugee adults seek behaviors taboo to Islamic principles, such as drinking, smoking, and partying. On the other hand, participants reported that their displacement led to a greater understanding of individuals and religions outside of their own. This included exposures to churches, synagogues, as well as individuals who do not believe in God(s) or follow a specific faith. One participant from Syria stated:

> *Of course, I became a lot more aware. I learned how to interact with people from different faiths and walks of life. I think this experience has made me a lot more aware. I do not think I will regret coming to Germany. On the contrary, I say, alhamdulilah* (thank God) *I arrived here and tried this. If I had stayed in Syria, I would have never experienced what it is like to be expatriated, to integrate in a new society, or with new religions, how to maintain yourself, culture and traditions in a new place, so I consider this [not only] an opportunity, but a nice chance.*

Another participant from Iraq stated:

> *Things have changed here in Germany. I could go out whenever I want, I can do whatever I want. If I want to pray, I pray. If I want to drink, I drink. Whatever I want, I can do it. No one will tell me that this is against religion, or bad for the environment. I want my children to live their life without being judged.*

Most participants felt that the integration process was not contingent on or impeded by their faith. One participant from Syria stated that it was the responsibility of the refugee or migrant to acclimate, and that Germans were not responsible for acclimating to Arab or Muslim culture. While all participants interviewed identified as Muslims, two participants described themselves as "non-practicing" Muslims, noting changes that had occurred since they had arrived to Germany. One of these "non-practicing" participants, originally from Syria, used the example of seeing people from all walks of life on the metro to demonstrate his shift in thinking regarding religion:

> *After a short time here [in Germany], you start thinking in a different way. You get on the metro, you start to see a lot of people – you ask why do these people think in a different way? Lots of incentive to ask yourself the question – "why am I this way? Why did I choose this religion [to follow]?" You then arrive to different convictions, you establish new convictions, depending on the circumstances.*

Other participants noted the consistency of their faith identity throughout their displacement and integration process, emphasizing that they felt no pressure or would not succumb to the pressure of changing their faith for the sake of integration. The following participant from Syria stated:

> *If a German is to accept me, they will accept me as I am. I am not going to change so someone else can accept me. For those who are changing religiously, ethically, or culturally for others to accept them...I think that when Germans see someone like this [i.e. drinking alcohol in violation of their religious beliefs], then they will not respect them.*

Another participant from Syria shared how their faith has grown stronger since their arrival to Germany, particularly what they refer to as "the permanence" of God as a source of continuity, protection, and company in her new surroundings:

> *In Syria, honestly, I was a bit more distracted with the world. I was living my normal life. Here, I am trusting of God, since I felt that my God is permanent, more so than people. In terms of my faith, God is everlasting and always there for me. Before, in Syria, I was always with my family, I had a routine, we were happy. All of a sudden, when you are alone...this is all from God. He permits you to travel safely, you come here, you walk by yourself, and you think of how much hardship there is in the world.*

When prompted to answer about changes in frequency of and commitment to faith practices, many participants cited having been more committed to practices in their country of origin than in Germany. For example, some participants reported praying less throughout the week, especially for those who worked full-time and could no longer attend Friday prayer or had limited access to an Arabic-speaking mosque or mosque of their Islamic sect. One participant from Syria stated:

> *I feel this sort of hajiz* (barrier) *ever since I arrived to Germany. I miss the sound of the call to prayer* (athan). *I feel unable to pray and unmotivated to pray when I am here. Living in a Muslim country, like when I lived in Turkey, made a difference for me. It felt closer to home and reminded me of my faith practices more often. When I arrived to Germany, I developed averse feelings to religion and religious practices, which may be a result of my depression. In my worst moments, I am no longer motivated to seek help from God and feel demotivated from praying or practicing my faith.*

Some participants, mainly male, were also concerned about access to mosques and expressed distrust regarding religious leaders and mosques in Germany:

> *I am finding some difficulties in maintaining prayer here. In Syria, I used to never miss a prayer, but not because I am less convinced [by my faith]. It is a shortage on my end. Near my house, there is no mosque near my house. The closest one is an hour away. My faith practice is inside my house, mainly.*
>
> *One of the main reasons I do not go to the mosques in Germany is because there are no imams* (religious clerics) *in Germany like there were in Syria. Here, we do not know their backgrounds. They may be really good, but I do not know where they came from or the education they received to become an imam. In Syria, the imam was known by the village or city he lived in. Someone who is good, someone who is a hafiz* (memorizer of the Qur'an) – *you know that the society has nominated this person. Here, you do not know his background, and he could be influenced by foreign ideologies.*

Faith-Based Coping Methods to Address Distress During Integration

The majority of participants expressed that particular aspects of their faith and faith practices served as a positive source of comfort and reassurance throughout their mental distress and integration experience in Germany. Examples included attending religious services, making supplications, meeting other Muslims, and seeking help from a religious leader.

Some participants mentioned the importance of remembering and thinking of God as a means of coping with distress. One participant from Syria noted:

> *Honestly, my faith in God is what keeps me going. I am convinced that the world is temporary… We know that there is a Hereafter, there is Heaven, there is something more beautiful, endless happiness, no anxiety, no sadness, no depression. This is something very comforting and brings me patience.*

Another participant from Iraq stated:

> *I remember God without going to the mosque. While I am walking, I ask God to forgive me, to guide me, to release me, to keep me safe. A prayer is listened to no matter where you are, as long as it comes with an intention and a heart that is really broken or needs help.*

Other participants focused on the sense of calm they feel when reading Qur'an, praying, or supplicating. One participant from Syria shared:

> *Religion helps those who understand it. Reading or hearing Quran cools* (calms) *the nerves. Sometimes I make supplication in order to ask for help, and I cry. You feel a weight on your body, that nothing in this world is worthwhile. When you read Quran or pray, you feel comfort all over your body, God makes you feel this sense of calm.*

Another participant from Iraq emphasized their reliance on prayer:

> *Prayer makes me feel better because it makes me closer to God. He may forgive me, bless me, help me lead a path that is more different.*

More than one participant shared their thoughts on how faith-based methods of coping should be supplemented with medical treatment. The following was shared by a participant from Syria:

> *I know people who use religion for everything. God said, "For everyone who tastes, there is medicine." God says, "Ask for help [my worshipper], and I will help you," if you want to seek treatment, and I will help you find it through your prayer. I will make the heart of the doctor feel for you, the pharmacist will help you. If I am sitting at home, and wait for God to treat me. God will not send us treatment in an envelope.*

Two participants from Syria, noted the lack of nearby mosques, which would have otherwise been a source of support when feeling distressed:

> *If there was a mosque near my house, I think this would really help me. Sometimes depression and an overall mental health situation can impact one's mental health situation in a way that doesn't allow one to think realistically. The one thing that really helps me become stronger is religion, such as reading Quran or to pray (feel connected to God), makes me feel a sense of psychological well-being, to be honest.*
>
> *Even if you have trouble in the real world, and you feel pressure, you go inside the mosque and start to cry. Once I leave, I feel like I am back to reality. Your negative thoughts start to escape you, your sadness. I start to feel much happier. I started to feel so depressed, and when I was hospitalized, I asked for a Quran and to visit a mosque. The translator came and he said he would bring me one as a gift.*

A few participants stated that they had sought help from a religious cleric. While some participants, particularly females, had positive experiences seeking support from religious clerics, one participant from Iraq noted a different experience:

> *I tried to ask for help about my depressive symptoms, and the sheikh (religious cleric) told me to be make dua (supplication), to pray, to be patient, and to ask for forgiveness. I told him that I do not think I did anything wrong, that this depression that has existed for 4 years, it needs to be solved somehow.*

Advice for German Mental Health Providers

When participants were asked what they would like German (i.e., non-migrant) mental health providers about their cultural or spiritual backgrounds in order to optimize mental health treatment, a range of response was provided. In particular, the importance of the presence of a family and community for well-being were addressed, for example, by one Syrian participant:

> *[It is] important that they [non-Arab health providers] understand Arab culture, such as where happiness comes from a societal perspective. For example, family is one of the most important pillars of happiness in Arab culture.*

Participants expressed their preference for Arabic-speaking mental health professionals (although, not necessarily Muslim) who could understand them directly, both in language, as well as the trauma they experienced before, during, and after their displacement. Put simply, by a participant from Iraq:

> *I would like this person [the German mental health professional] to understand where I come from.*

The lack of a shared language for communication between patient and provider can also inhibit non-Arabic speaking mental health professionals from understanding culturally-specific manifestations of mental health conditions, such as a type of hair loss described by the same Iraqi participant, may be an explanation for particular mental health symptoms:

> *For example, da' al tha'lab [in English: sudden hair loss or Alopecia areata] is a situation where you lose your hair as a result of fear or poor mental health. I had a year where I was dealing with this. The [German] doctor told me that this was a psychological condition. However, I know that it could be from fear (if you were robbed for example, someone robbed you) in addition to poor mental health.*

Another participant from Iraq also shared the need for empathy or a broader understanding of the trauma that was experienced by the client by the German or non-Arabic speaking mental health professional:

> *If I told a German psychiatrist about the trauma I have endured, I would want them to be able to help with these experiences and to see it as a reality, not something that is fictional.*

Participants expressed the specific need for awareness among mental health professionals in Germany on specific aspects of their culture, religion, or traditional methods of coping, such as spiritual forms of mental health support, as described by a Syrian participant:

> *A German psychiatrist would just treat your symptoms and give you a diagnosis. If someone who wants any kind of spiritual support, it might not be allowed. The doctor must really focus on religion. Because a renewal of the soul requires this sort of attention.*

DISCUSSION

This is one of few studies addressing faith-based coping methods among distressed Arabic-speaking refugees and asylum-seekers from Muslim-majority countries in Germany. Using a grounded theory approach, our analysis demonstrated a wide spectrum of definitions and interpretations of faith among Arabic-speaking refugees and asylum-seekers seeking mental health services, most of which had been shaped by challenging and often traumatic experiences before, during, and throughout their displacement and extending into the integration process. This was most explicitly demonstrated in the first three themes: (i) faith-based coping during flight, (ii) changes in faith practices upon arrival, and (iii) faith-based coping methods to address distress during integration.

Most participants in this sample had experienced significant challenges ahead of their arrival to Germany, including exposure to stressful events in Syria and Iraq before departure, multiple displacements and attempts to integrate into other host country contexts, detention and torture, and dangerous journeys by land or boat to arrive to Europe. Following arrival, participants cited social and economic barriers to integrating into German society, including difficulties learning the language, becoming accustomed to new culture, finding housing and employment, and the chronic uncertainty of what the future held for them. This had resulted in significant distress and negative mental health symptoms among those in the study sample, who had all decided to seek mental health treatment at the Charité Universitaetsmedizin-sponsored mental health clinic, where interviews took place.

Upon inquiry, our study found that the participants' dynamic relationship with their faith following their arrival to Germany played a direct role in how faith-based coping methods were or were not utilized when experiencing mental health symptoms. Most of those interviewed had only ever lived in Syria or Iraq, or had been displaced to Muslim-majority countries before their arrival to Germany. Particularly for male participants in this study, Germany provided a novel landscape for the exploration and interpretation of varying faith practices outside of own's own, and the integration process often involved a determination of which practices were helpful, or not so helpful, to their mental health and well-being. These trends are similar to findings from a recent study of Syrian refugees in the Netherlands, which demonstrated that levels of commitment to faith or religious practices influence coping strategies and overall feelings of integration (30). Those demonstrating a stronger commitment to faith were more likely to utilize faith-based coping strategies when seeking mental health services, including seeking support from religious leaders or local religious institutions.

We found notable differences in perspectives between male and female participants, female participants demonstrated of which demonstrated a greater reliance on faith-based coping mechanisms, including attending regular religious lectures and support groups in mosques, asking religious clerics for support with mental health symptoms, and reading Quran or praying in one's personal time. Male participants, on the other hand, expressed greater dissent than females with the religious infrastructures in Germany, including distrust of imams and particular religious bodies, lack of engagement with clerics for treatment and lower attendance of weekly (Friday) prayers. Nonetheless, and consistent with previous studies published on this topic (20, 26, 31) which highlight the intertwined nature of cultural and religious norms in these populations, faith was an enduring force in the lives of the majority of the Syrian and Iraqi refugee adults interviewed in this study, regardless of level of commitment to faith practices.

The fourth and final theme (iv) identified in this study included constructive advice from participants for German mental health providers, particularly providers who do not have a shared migrant background. These findings, which include a call for greater empathy and understanding of Syrian and Iraqi culture and faith practices, as well as specific ways of interpreting distress, could be particularly useful for German mental health providers engaging refugee and asylum-seeking populations. This includes the significance of family and community in the healing process, a common source of social support mechanism that may be absent for most refugees and asylum-seekers in Europe who are restricted from visiting family or have pending family reunification status. Positive faith-based coping strategies identified by participants to improve mental health outcomes, such help-seeking from religious leaders, reading Qur'an, remembering God, or making supplication can help inform service delivery by sharing these insights with mental health care providers in Germany (32). These perspectives also help identify themes of broader religious and social support in order to facilitate the integration of this population in their current context. The results of this study have implications for a variety of actors and stakeholders invested in facilitating both the short- and the long-term integration of such populations, including the need to develop culturally- and faith-sensitive interventions and to introduce cultural mediators to the clinical setting in order to facilitate the relationship between mental health provider and patient. Furthermore, results regarding positive faith-based coping methods demonstrate opportunities for local engagement from mosques and Islamic organizations with the Syrian, Iraqi, or broader Muslim refugee population, particularly in providing basic psychosocial support, mental health awareness, and expanding referrals to mental health professionals.

The cultural and context-specific interpretations of optimal mental healthcare by refugee communities provide insight on how non-profit organizations, faith-based organizations, and religious institutions can collaborate with mental health professionals to provide faith-based training and culturally-sensitive approaches to working with refugee populations as well as pose alternatives to the linguistic and cultural barriers posed by the German health system. This includes training for German mental health providers regarding the cultural and religious backgrounds of refugee clients they often provide care for, as well as overall sensitivity to the sociopolitical circumstances refugee clients escaped from ((33, 34). Religious clerics and spiritual leaders who are approached by refugee clients seeking faith-based treatment should also be trained to provide referrals to specialized mental health services for refugee populations (35).

An unanticipated finding was that many participants, when answering questions about their own faith identity and integration experiences, cited the experiences of others. This included current and former friends, members of their families, acquaintances, roommates, and a broader description of the refugee community at large (often identified as "the Syrians" or "the Arab community"). These generalizations provided a useful comparison for the participant, in order to either differentiate or state their similarity to this broader refugee community, particularly when describing shifts in their faith identities, their integration process, and their reliance on faith as a coping mechanism.

Furthermore, an important ethnographic consideration was the interchangeability of the concepts of religion, spirituality, cultures, and traditions that were utilized during the interviews. For example, expressing the extent of "religiosity" led to discussions regarding Syrian and Iraqi culture and traditions and how they differed extensively from those in Germany. The term "spirituality" was less understood by participants and is less referred to in the literature describing faith-based coping methods among Arab or Muslim populations (25, 36). Although there is limited information regarding the application of religious and spiritual healing methods for refugee populations who may have endured religious or ethnic persecution, there is significant literature on the application of these concepts in Islam and on Muslim populations broadly (37).

Due to the conceptual nature of the interviews, there were a number of limitations that emerged throughout the study.

The first limitation was that questions regarding faith-based coping often required an additional layer of explanation by the interviewer to each participant in order to clarify the intentions of the questions asked. This may have influenced answers given by participants following examples posed by the interviewer regarding faith-based coping, which included relying on prayer, reciting or reading scripture, or attending the mosque, in order to cope with particular mental health challenges. This was particularly the case given that these concepts, although designed using frameworks regarding faith-based coping in English, were inquired about and discussed in Arabic.

Another limitation of this study was the sensitive nature of the questions asked, particularly of participants who had faced religious persecution in their countries of origin. To address this issue, we aimed to clarify during interviews that these questions were aimed to support the improvement of mental health care and treatment provided to Arabic-speaking patients in Germany and in other Western contexts. This may have also led to answers that seemed more favorable or acceptable to the interviewer.

Lastly, all participants in this study were receiving treatment for their mental health symptoms and were therefore considered patients of the clinic in which the study was being conducted. This may have resulted in an overall wariness regarding what could be shared during the interviews, particularly criticisms of German or Arab mental health professionals who were currently working in the clinic. Furthermore, our sampling procedure included only Arabic-speaking individuals who demonstrated an interest in the topic of the study regarding faith-based coping and mostly represented individuals from Syria and Iraq. Future studies should attempt to represent the experiences of other refugee and asylum-seeking populations living in Germany and in Europe, more broadly.

CONCLUSION

Overall, the results of this study demonstrate a variety of faith-based strategies for coping with displacement and the integration process among refugees and asylum-seeking populations from Arabic-speaking and Muslim-majority countries. The study also addresses changes in faith that this population may experience during integration and includes recommendations from refugees themselves to make mental healthcare services more culturally-sensitive. These findings also indicate the importance of understanding cultural- and faith-specific interpretations of mental health symptoms and subsequent actions for diagnosis and treatment of mental health conditions experienced by these populations. As European and North American countries remain top destinations for refugees and asylum-seekers, studies exploring culturally-specific mental health needs of refugees from Muslim-majority countries across Germany are critical to improving the quality of mental health services and in turn, facilitating social integration for these populations. The outcomes of this research could be beneficial for mental health professionals, non-governmental organizations, faith-based organizations, humanitarian aid agencies, and hospitals providing mental health and psychosocial support services to Arabic-speaking refugees in Western contexts. Future studies should take note of the perspectives of mental healthcare providers and other healthcare workers and mediators working with refugees throughout mental health clinics in Germany and in other Western contexts where a large majority of refugees from Arabic-speaking or Muslim-majority countries have been resettled.

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 human participants were reviewed and approved by Ethical Committee of the Charité Universitaetsmedizin Berlin. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

DR conceived of the study, collected the data, and coded the transcripts with inputs from MB throughout. DR performed the thematic analysis with feedback and input from MB and LW. DR wrote the manuscript with multiple revisions from MB, CK, DC, and LW. All authors contributed to the article and approved the submitted version.

FUNDING

DR was funded by the U.S. Fulbright Scholar Program to complete this study. The MEHIRA study is funded by the Innovations fond, Federal Ministry of Health in Germany (01VSF16061).

ACKNOWLEDGMENTS

The authors would like to thank Nico Lindheimer and Kerem Böge (Charité University of Medicine) for their assistance and coordination throughout this project, as well as Caitlin Kennedy and Pamela Surkan (Johns Hopkins Bloomberg School of Public Health) for feedback on the final manuscript.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.595979/full#supplementary-material

REFERENCES

1. Silove D, Ventevogel P, Rees S. The contemporary refugee crisis: an overview of mental health challenges. *World Psychiatry.* (2017) 16:130–9. doi: 10.1002/wps.20438
2. Elbert T, Wilker S, Schauer M, Neuner F. Dissemination psychotherapeutischer Module für traumatisierte Geflüchtete. *Der Nervenarzt.* (2017) 88:26–33. doi: 10.1007/s00115-016-0245-3
3. Kaltenbach E, Härdtner E, Hermenau K, Schauer M, Elbert T. Efficient identification of mental health problems in refugees in Germany: the Refugee Health Screener. *Eur J Psychotraumatol.* (2017) 8:1389205. doi: 10.1080/20008198.2017.1389205
4. Winkler J, Brandl E, Bretz H, Heinz A, Schouler-Ocak M. Psychische Symptombelastung bei Asylsuchenden in Abhängigkeit vom Aufenthaltsstatus. *Psychiatr Praxis.* (2018) 46:194. doi: 10.1055/a-0806-3568
5. Walther L, Kröger H, Tibubos AN, von Scheve C, Schupp J, Tam Ta TM, et al. Psychological distress among refugees in Germany: A cross-sectional analysis of individual and contextual risk factors and potential consequences for integration using a nationally representative survey. *Br Med J Open.* (2020) 10:e033658. doi: 10.1136/bmjopen-2019-033658

6. Sandalio RN. *Life After Trauma: The Mental-Health Needs of Asylum Seekers in Europe*. Washington, DC: Migration Policy Institute (2018).
7. Georgiadou E, Zbidat A, Schmitt GM, Erim Y. Prevalence of mental distress among Syrian refugees with residence permission in Germany: a registry-based study. *Front Psychiatry.* (2018) 9:393. doi: 10.3389/fpsyt.2018.00393
8. Brandt L, Henssler J, Müller M, Wall S, Gabel D, Heinz A. Risk of psychosis among refugees: a systematic review and meta-analysis. *JAMA Psychiatry.* (2019) 76:1133–40. doi: 10.1001/jamapsychiatry.2019.1937
9. World Health Organization. *Mental Health Promotion and Mental Health Care in Refugees and Migrants: TECHNICAL guidance*. Knowledge Hub on Health and Migration (2018). Available online at: https://www.euro.who.int/__data/assets/pdf_file/0004/386563/mental-health-eng.pdf (accessed May 18, 2020).
10. UNHCR. *Global Trends: Forced Displacement in 2018*. UNHCR (2018). Available online at: https://www.unhcr.org/en-us/statistics/unhcrstats/5d08d7ee7/unhcr-global-trends-2018.html (accessed December 31, 2020).
11. Romei V, Ehrenberg-Shannon B, Maier-Borst H, Chazan G. *How Well Have Germany's Refugees Integrated?* Financial Times (2017). Available online at: https://www.ft.com/content/e1c069e0-872f-11e7-bf50-e1c239b45787 (accessed December 31, 2020).
12. Siegart M, *Refugees' Religious Affiliation, Religious Practice, and Social Integration*. Nuremberg: German Federal Office for Migration and Refugees (BAMF) (2020).
13. Pew Research Center. *Europe's Growing Muslim Population*. Pew Forum (2017). Available online at: https://www.pewforum.org/2017/11/29/europes-growing-muslim-population/ (accessed May 18, 2020).
14. Falk R. *Refugees, Migrants and World Order*. The Refugee Crisis and Religion. (2017). p. 23–34. London: Rowman and Littlefield International.
15. Human Rights Watch. *European Union: Events of 2018*. Human Rights Watch (2018). Available online at: https://www.hrw.org/world-report/2019/country-chapters/european-union (accessed May 18, 2020).
16. Waagnvoorde R. How Religion and secularism (don't) matter in the refugee crisis. In: Mavelli L, Wilson EK, editors. *The Refugee Crisis and Religion*. London: Rowman and Littlefield International (2017). p. 61–74.
17. Su A. *Why Germany's New Muslims Go to the Mosque Less*. The Atlantic (2017). Available online at: https://www.theatlantic.com/international/archive/2017/07/muslim-syrian-refugees-germany/534138/ (accessed May 18, 2020).
18. Buber-Ennser I, Goujon A, Kohlenberger J, Rengs B. Multi-layered roles of religion among refugees arriving in Austria around 2015. *Religions.* (2018) 9:154. doi: 10.3390/rel9050154
19. Böge K, Karnouk C, Hahn E, Schneider F, Habel U, Banaschewski T, et al. Mental health in refugees and asylum seekers (MEHIRA): study design and methodology of a prospective multicentre randomized controlled trail investigating the effects of a stepped and collaborative care model. *Eur Arch Psychiatry Clin Neurosci.* (2020) 270:95–106. doi: 10.1007/s00406-019-00991-5
20. Hassan G, Kirmayer LJ, Mekki-Berrada A, Quosh C, el Chammay R, Deville-Stoetzel JB, et al. *Culture, Context and the Mental Health and Psychosocial Wellbeing of Syrians: A Review for Mental Health and Psychosocial Support Staff Working With Syrians Affected by Armed Conflict*. Geneva: UNHCR (2015).
21. Rathod S, Kingdon D, Pinninti N, Turkington D, Phiri P. *Cultural Adaptation of CBT for Serious Mental Illness: A Guide for Training and Practice.* Hoboken, NJ: John Wiley and Sons (2015).
22. Böge K, Karnouk C, Hahn E, Demir Z, Bajbouj M. On perceived stress and social support: depressive, anxiety and trauma-related symptoms in arabic-speaking refugees in Jordan and Germany. *Front Public Health.* (2020) 8:239. doi: 10.3389/fpubh.2020.00239
23. Walker P, Mazurana D, Warren A, Scarlett G, Louis H. The role of spirituality in humanitarian crisis survival and recovery. *Sacred Aid: Faith and Humanitarianism.* New York, NY: Oxford University Press. (2012). p. 115–39.
24. Pargament KI. *The Psychology of Religion and Coping: Theory, Research, Practice*. New York, NY: Guilford Press (2001).
25. Hasan N, Mitschke DB, Ravi KE. Exploring the role of faith in resettlement among Muslim Syrian refugees. *J Religion Spirit Soc Work.* (2018) 37:223–38. doi: 10.1080/15426432.2018.1461045
26. McMichael C. 'Everywhere is Allah's place': Islam and the everyday life of Somali women in Melbourne, Australia. *J Refugee Stud.* (2002) 15:171–88. doi: 10.1093/jrs/15.2.171
27. *Charité MEHIRA Health Service Research*. Available online at: https://www.charite.de/en/research/charite_research/research_projects/innovation_fund/mehira/ (accessed December 31, 2020).
28. Charmaz K. 'Discovering'chronic illness: using grounded theory. *Soc Sci Med.* (1990) 30:1161–72. doi: 10.1016/0277-9536(90)90256-R
29. Anandarajah G, Hight E. Spirituality and medical practice: using the HOPE questions as a practical tool for spiritual assessment. *Am Fam Phys.* (2001) 63:81. doi: 10.1016/s1443-8461(01)80044-7
30. Safak A, Kunuroglu FK, van de Vijver F, Yagmur K. Acculturation of Syrian refugees in the Netherlands: religion as social identity and boundary marker. *J Refugee Stud.* (2020) 18–9. doi: 10.1093/jrs/feaa020
31. Grupp F, Moro MR, Nater UM, Skandrani S, Mewes R. 'Only God can promise healing.': help-seeking intentions and lay beliefs about cures for post-traumatic stress disorder among Sub-Saharan African asylum seekers in Germany. *Eur J Psychotraumatol.* (2019) 10:1684225. doi: 10.1080/20008198.2019.1684225
32. Schweitzer R, Van Wyk S, Murray K. Therapeutic practice with refugee clients: a qualitative study of therapist experience. *Counsel Psychother Res.* (2015) 15:109–18. doi: 10.1002/capr.12018
33. Hassan G, Ventevogel P, Jefee-Bahloul H, Barkil-Oteo A, Kirmayer LJ. Mental health and psychosocial wellbeing of Syrians affected by armed conflict. Epidemiol Psychiatric Sci. (2016) 25:129–41. doi: 10.1017/S2045796016000044
34. Patel NSA, Sreshta N. The role of psychiatrists in the growing migrant and refugee crises. *Am J Psychiatry Residents' J.* (2017) 12:6–8. doi: 10.1176/appi.ajp-rj.2017.120703
35. Ali OM, Milstein G. Mental illness recognition and referral practices among imams in the United States. *J Muslim Mental Health.* (2012) 6:10. doi: 10.3998/jmmh.10381607.0006.202
36. Ai AL, Tice TN, Huang B, Ishisaka A. Wartime faith-based reactions among traumatized Kosovar and Bosnian refugees in the United States. *Mental Health Religion Cult.* (2005) 8:291–308. doi: 10.1080/13674670412331304357
37. Pridmore S, Pasha Mi. Religion and spirituality: Psychiatry and Islam. *Aust Psychiatry*. (2004) 12:381–5. doi: 10.1080/j.1440-1665.2004.02131.x
38. Walther L, Fuchs LM, Schupp J, von Scheve C. Living conditions and the mental health and well-being of refugees: evidence from a large-scale German survey. *J Immigr Minor Health*. (2020) 22:1–11. doi: 10.1007/s10903-019-00968-5

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 handling editor declared a shared affiliation with the authors at time of review.

frontiers in Psychiatry

OPINION
published: 22 February 2021
doi: 10.3389/fpsyt.2021.585952

Using Mind-Body Medicine to Reduce the Long-Term Health Impacts of COVID-Specific Chronic Stress

Vojislav Maric [1], ***Jyoti Mishra*** [1] ***and Dhakshin S. Ramanathan*** [1,2]*

[1] Neural Engineering and Translation Labs, Department of Psychiatry, University of California, San Diego, La Jolla, CA, United States, [2] Department of Mental Health, Veteran's Affairs San Diego Medical Center, San Diego, CA, United States

Keywords: chronic stress, mindfulness, exercise, relaxation response, COVID-19

Edited by:
Tam Thi Minh Ta,
Charité University Medicine
Berlin, Germany

Reviewed by:
Kerem Böge,
Charité–Universitätsmedizin
Berlin, Germany
Eric Hahn,
Charité–Universitätsmedizin
Berlin, Germany

***Correspondence:**
Dhakshin S. Ramanathan
dramanathan@ucsd.edu

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *07 August 2020*
Accepted: *01 February 2021*
Published: *22 February 2021*

Citation:
Maric V, Mishra J and Ramanathan DS (2021) Using Mind-Body Medicine to Reduce the Long-Term Health Impacts of COVID-Specific Chronic Stress. Front. Psychiatry 12:585952. doi: 10.3389/fpsyt.2021.585952

INTRODUCTION

Mental health continues to be a rising concern for the global population during the COVID-19 pandemic (1, 2). Addressing these issues requires us to consider the COVID-19 pandemic as a major, global and chronic life-stressor. Stresses related to the pandemic include the risk/fear of getting infected; social isolation; lack of schooling for children; potential for increased interpersonal conflict (domestic violence/trauma), and job/income loss (1, 2). While exact numbers are difficult to come by, early evidence suggests that the global COVID-19 pandemic has led to an increase in acute stress, along with a corollary increase in anxiety and depression across multiple countries and populations studied (1, 3–5). However, these stressors have already lasted for almost a year and may continue as lockdowns continue to be enforced worldwide, thus making them chronic rather than acute in nature. Moreover, despite the advent of vaccines, public health experts, such as Dr. Fauci (head of the US National Institute of Allergy and Infection Disease) suggested a return to normality might only occur at the end of 2021 in the US. Viewing the effects of COVID-19 pandemic as a chronic stressor is important for two reasons: (1) it suggests that the long-term effect of pandemic-related stress may be a worsening of both chronic physical and mental health, both of which are well-documented related to the impacts of chronic stress (6–8). (2) It suggests that specific, practical, affordable, and globally implementable strategies shown to help with chronic stress can be utilized.

PHYSIOLOGIC EFFECTS OF CHRONIC STRESS

Stress can be considered both acute and chronic (7, 8). Acute stress (as occurs when facing a short-lived life-threatening situation) triggers a stress response that includes an increase in catecholamine and glucocorticoid "stress" hormones from the adrenal gland along with an increase in activity of the sympathetic nervous system (7). Chronic, repeated stress, as is currently occurring due to the COVID-19 pandemic, leads to a sustained elevation of this stress response. A chronic increase in catecholamines results in a long-term increase in heart rate and blood pressure along with disruptions of the circadian system regulating sleep (6). Dysregulation of stress hormones driven by chronic stress can lead to both over and under-active glucocorticoid systems, further impacting a number of biological systems. These disruptions can lead to a number of physiological effects, such as an increased desire for high fat/salt foods (6, 9), worsening cardiovascular risk factors (hyperlipidemia, pro-inflammatory state) and impaired brain function, including dysfunction of the hippocampus and prefrontal cortex and increased growth of parts of the amygdala directly linked with anxiety (8). As a consequence of this litany of biological effects, chronic stress has been linked with worse mental health (depression, anxiety disorders, PTSD, and substance abuse) and physical health problems (insulin resistance, diabetes, and cardiovascular disease outcomes most prominently) (6, 9). Given all of this, it is important to recognize that the increase in stress experienced globally during this pandemic may lead to a long-term increase in both physical and mental health sequelae including worsening cardiovascular risk factors, anxiety, and depression (6, 9).

MIND-BODY MEDICINE AS A KEY TOOL TO MITIGATE CHRONIC STRESS

The Centers for Disease Control and Prevention (CDC), one of the major public health governing bodies in America, and others, have recommended common-sense strategies focused on mental health well-being during the COVID-19 pandemic (https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/managing-stress-anxiety.html). Many of these mind-body medicine approaches have shown clear efficacy in improving the psychological and physiological manifestations of chronic stress. From this perspective, such approaches should be considered an essential first-line response to dealing with pandemic-related chronic stress for all. While mind-body medicine can cover a range of practices, most of them can be grouped into a category of practices that trigger the "relaxation response," a physiological state of lower sympathetic tone, increased parasympathetic tone, and lower resting heart rate, respiratory rate and blood pressure (10), essentially the opposite of the "flight-fight" response. Three practices also fit important criteria for implementation (low-cost, scalable, globally implementable, and evidence-based): physical practices (e.g., exercise), mindfulness-based practices (meditation, respiratory control), and practices focused on increasing social engagement. Wide-spread adoption of these practices would be safe, cost-effective, evidence-based methods of promoting resilience to chronic stress during the COVID-19 pandemic and to potentially prevent the development of long-term mental/physical ill-health symptoms.

Exercise

Exercise counteracts many of the physical manifestations of stress associated with increased cardiovascular risk (blood pressure, insulin resistance, lipids) (9, 11). In addition, exercise has been shown to diminish the psychological impacts of stress: it improves mood and affect, diminishes anxiety and diminishes reports of perceived stress (11). Systematic meta-analyses (9, 10), have shown that exercise has at least a moderate effect size in treating anxiety, depression and other stress-related mental health disorders, with effect sizes similar to that observed with pharmacotherapy and psychotherapy. Thus, exercise should be recommended as an effective stress-reduction tool to help individuals cope with mild to moderate psychiatric anxiety and mood symptoms emerging as a consequence of the COVID-19 pandemic.

Mindfulness

Despite the many observed physical manifestations of chronic stress, it is probably most clearly felt as a psychological state of perturbation, anxiety or distress. For this reason, mindfulness approaches have long been seen as a specific antidote to stress (12). Like exercise, mindfulness practices seem to improve both the physical and psychological impacts of chronic stress, including blood pressure, heart rate, cortisol, CRP (a marker of inflammation) and lipids (13). These effects may be due to the "relaxation response" described above. Mindfulness-based approaches seem to be about as effective as other evidence-based treatments for many psychiatric conditions linked with chronic stress, including depression, pain, smoking and addictive disorders (14). Interestingly, part of the effects of meditation may be linked with slowing of the breath. Simple nasal diaphragmatic breathing with awareness is an effective mechanism for leading to the relaxation response (15, 16) with powerful effects on core brain circuits (parasympathetic nervous system, prefrontal cortex) involved in mood and stress regulation (17). These effects have been observed for a long time: the *Hatha Yoga Pradipika* text from the fifteenth century states: "When the breath is irregular, the mind wavers; when the breath is steady, so is the mind. To attain steadiness, the yogi should restrain (i.e., slow) his breath" (18).

Social Engagement

Social isolation is known to be a unique but important stressor (8). It has been demonstrated that social isolation is a known stressor that is associated with negative health outcomes of all ages (19). While the above methods (exercise and mindfulness practices) may help with this stressor, maintaining social ties (both "strong" and "weak"), at least in certain populations, can also be an important aspect of dealing with chronic stress and maintaining resilience (20). Recent social media research shows that strong ties can be maintained globally across continents on online platforms (21). Thus, even with health recommendations for physical distancing, social engagement is possible with current online technologies, though excessive use can also cause harm, especially in adolescents (22, 23).

PRACTICAL RECOMMENDATIONS AND DISCUSSION

With all of the practices above (physical exercise, meditation/respiratory control, social engagement), we believe specific recommendations can be made, based on evidence, to promote stress resilience. For exercise: at least 10–15 min/day of moderate intensity exercise can promote stress resilience. It is less clear if the type of exercise matters, and neither extended (i.e. longer than 30 minutes) or high intensity exercise seems necessary for stress mitigation (24, 25), For mindfulness: it is unclear if the type of meditation matters. The simplest form of meditation is breath awareness, and this, coupled with intranasal slow respirations to trigger the relaxation response, will likely be as effective as any more complicated meditation style. Moreover, meditation ∼5×/week, for as short as 15 min/day, may be sufficient to deliver effects (26). In Pranayama, one of most commonly practiced breath control techniques, slowing the breath arises by maintaining standardized pauses during and between inspiration and expiration cycles and using nostril breathing. Slowing the breath, using a beginner" Pranayama respiration exercise uses a 1:1:1 cycle of inspiration, starting with 4 s inhale, 4 s pause, and a 4 s exhale, can further leverage direct respiratory coupling to mood regulation circuits. Even during COVID-19-pandemic related physical distancing recommendations, digital apps may be used to further support mental health and even to enhance adherence to practice (27, 28). Social support is known to enhance intervention adherence (29, 30), hence, it could be ideal to leverage online social group support simultaneous with physical exercise and mindfulness activities.

AUTHOR CONTRIBUTIONS

JM, VM, and DR jointly conceptualized and wrote the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by awards from the Department of Veterans Affairs, Veterans Health Administration (Career Development Award: 7IK2BX003308 to DR); start-up funds from the UCSD Department of Psychiatry to DR and JM; and a Career Award for Medical Scientists Award from the Burroughs Wellcome Fund to DR. This research was supported by UC San Diego School of Medicine start-up funds (DR and JM), a VA Career Development Award (DR), and a Burroughs-Wellcome Fund Career Award for Medical Scientists (DR).

REFERENCES

1. Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: mental health consequences and target populations. *Psychiatry Clin Neurosci.* (2020) 74:281–2. doi: 10.1111/pcn.12988
2. Dutheil F, Mondillon L, Navel V. PTSD as the second tsunami of the SARS-Cov-2 pandemic. *Psychol Med.* (2020) 1–2. doi: 10.1017/S0033291720001336
3. Burke T, Berry A, Taylor LK, Stafford O, Murphy E, Shevlin M, et al. Increased psychological distress during COVID-19 and quarantine in Ireland: a national survey. *J Clin Med.* (2020) 9:3481. doi: 10.3390/jcm9113481
4. Holman EA, Thompson RR, Garfin DR, Silver RC. The unfolding COVID-19 pandemic: a probability-based, nationally representative study of mental health in the United States. *Sci Adv.* (2020) 6:eabd5390. doi: 10.1126/sciadv.abd5390
5. Campos JADB, Martins BG, Campos LA, Marôco J, Saadiq RA, Ruano R. Early psychological impact of the COVID-19 pandemic in Brazil: a national survey. *J Clin Med.* (2020) 9:2976. doi: 10.3390/jcm9092976
6. McEwen BS. In pursuit of resilience: stress, epigenetics, and brain plasticity: in pursuit of resilience. *Ann N Y Acad Sci.* (2016) 1373:56–64. doi: 10.1111/nyas.13020
7. McEwen BS, Sapolsky RM. Stress and cognitive function. *Curr Opin Neurobiol.* (1995) 5:205–16. doi: 10.1016/0959-4388(95)80028-X
8. Davidson RJ, McEwen BS. Social influences on neuroplasticity: stress and interventions to promote well-being. *Nat Neurosci.* (2012) 15:689–95. doi: 10.1038/nn.3093
9. Tsatsoulis A, Fountoulakis S. The protective role of exercise on stress system dysregulation and comorbidities. *Ann N Y Acad Sci.* (2006) 1083:196–213. doi: 10.1196/annals.1367.020
10. Benson H, Beary JF, Carol MP. The relaxation response. *Psychiatry.* (1974) 37:37–46. doi: 10.1080/00332747.1974.11023785
11. Penedo FJ, Dahn JR. Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Curr Opin Psychiatry.* (2005) 18:189–93. doi: 10.1097/00001504-200503000-00013
12. Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-based stress reduction and health benefits: a meta-analysis. *J Psychosom Res.* (2004) 57:35–43. doi: 10.1016/S0022-3999(03)00573-7
13. Pascoe MC, Thompson DR, Jenkins ZM, Ski CF. Mindfulness mediates the physiological markers of stress: systematic review and meta-analysis. *J Psychiatr Res.* (2017) 95:156–78. doi: 10.1016/j.jpsychires.2017.08.004
14. Goldberg SB, Tucker RP, Greene PA, Davidson RJ, Wampold BE, Kearney DJ, et al. Mindfulness-based interventions for psychiatric disorders: a systematic review and meta-analysis. *Clin Psychol Rev.* (2018) 59:52–60. doi: 10.1016/j.cpr.2017.10.011
15. Jerath R, Crawford MW, Barnes VA, Harden K. Self-regulation of breathing as a primary treatment for anxiety. *Appl Psychophysiol Biofeedback.* (2015) 40:107–15. doi: 10.1007/s10484-015-9279-8
16. Melnychuk MC, Dockree PM, O'Connell RG, Murphy PR, Balsters JH, Robertson IH. Coupling of respiration and attention via the locus coeruleus: effects of meditation and pranayama. *Psychophysiology.* (2018) 55:e13091. doi: 10.1111/psyp.13091
17. Maric V, Ramanathan D, Mishra J. Respiratory regulation & interactions with neuro-cognitive circuitry. *Neurosci Biobehav Rev.* (2020) 112 95–106. doi: 10.1016/j.neubiorev.2020.02.001
18. Iyengar BKS. *Light on Pranayama: The Yogic Art of Breathing.* London: Crossroad Publishing Co. (1985).
19. Cacioppo JT, Hawkley LC, Norman GJ, Berntson GG. Social isolation. *Ann N Y Acad Sci.* (2011) 1231:17–22. doi: 10.1111/j.1749-6632.2011.06028.x
20. Gaffey AE, Bergeman CS, Clark LA, Wirth MM. Aging and the HPA axis: stress and resilience in older adults. *Neurosci Biobehav Rev.* (2016) 68:928–45. doi: 10.1016/j.neubiorev.2016.05.036
21. Park PS, Blumenstock JE, Macy MW. The strength of long-range ties in population-scale social networks. *Science.* (2018) 362:1410–3. doi: 10.1126/science.aau9735
22. Kelly Y, Zilanawala A, Booker C, Sacker A. Social media use and adolescent mental health: findings from the UK Millennium Cohort Study. *EClinicalMedicine.* (2018) 6:59–68. doi: 10.1016/j.eclinm.2018.12.005
23. Shimoga SV, Erlyana E, Rebello V. Associations of social media use with physical activity and sleep adequacy among adolescents: cross-sectional survey. *J Med Internet Res.* (2019) 21:e14290. doi: 10.2196/14290
24. 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
25. Stubbs B, Vancampfort D, Rosenbaum S, Firth J, Cosco T, Veronese N, et al. An examination of the anxiolytic effects of exercise for people with anxiety and stress-related disorders: a meta-analysis. *Psychiatry Res.* (2017) 249:102–8. doi: 10.1016/j.psychres.2016.12.020
26. Fredrickson BL, Boulton AJ, Firestine AM, Van Cappellen P, Algoe SB, Brantley MM, et al. Positive emotion correlates of meditation practice: a comparison of mindfulness meditation and loving-kindness meditation. *Mindfulness.* (2017) 8:1623–33. doi: 10.1007/s12671-017-0735-9
27. Stawarz K, Preist C, Coyle D. Use of smartphone apps, social media, and web-based resources to support mental health and well-being: online survey. *JMIR Ment Health.* (2019) 6:e12546. doi: 10.2196/12546
28. Mishra J, Sagar R, Parveen S, Kumaran S, Modi K, Maric V, et al. Closed-loop digital meditation for neurocognitive and

behavioral development in adolescents with childhood neglect. *Transl Psychiatry*. (2020) 10:1–13. doi: 10.1038/s41398-020-0820-z

29. Beauchamp MR, Ruissen GR, Dunlop WL, Estabrooks PA, Harden SM, Wolf SA, et al. Group-based physical activity for older adults (GOAL) randomized controlled trial: exercise adherence outcomes. *Health Psychol*. (2018) 37:451–61. doi: 10.1037/hea0000615
30. Marquez B, Anderson A, Wing RR, West DS, Newton RL, Meacham M, et al. The relationship of social support with treatment adherence and weight loss in Latinos with type 2 diabetes. *Obesity (Silver Spring)*. (2016) 24:568–75. doi: 10.1002/oby.21382

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.

frontiers in Psychiatry

SYSTEMATIC REVIEW
published: 18 March 2021
doi: 10.3389/fpsyt.2021.643704

A Systematic Review of Factors Affecting Mental Health and Well-Being of Asylum Seekers and Refugees in Germany

Vivien L. Hajak[1]*, *Srishti Sardana*[2], *Helen Verdeli*[2] *and Simone Grimm*[1,3]

[1] Department of Psychology, Medical School Berlin, Berlin, Germany, [2] Global Mental Health Laboratory, Teachers College, Columbia University, New York, NY, United States, [3] Department of Psychiatry, Charité, Campus Benjamin Franklin, Berlin, Germany

Background: Since the onset of the 2015 European refugee crisis, ∼4. 46 million people have sought asylum in the European Union, with Germany logging the largest share of all asylum applications. In addition to the severe adversities before and during flight, the process of settling into a new environment involves stressors that affect psychological well-being and mental health. The aim of this systematic review was to examine contextual factors during post-migration that influence the mental health and well-being of asylum seekers and refugees (ASRs) in Germany.

Methods: Following PRISMA guidelines, a systematic review was conducted across multiple databases for English and German studies published between 2015 and 2020 with index keywords.

Results: From a total of 303 articles, 156 duplicates were removed and, after title review, another 87 were excluded for not meeting the inclusion criteria. After assessing the abstracts of the remaining 60 articles, 39 were excluded. Full texts of 21 articles were assessed for eligibility and after excluding 8 articles, 13 articles were included in the review. The results demonstrate high rates of psychological distress among ASRs in Germany and the significant influence of contextual factors on their mental health and psychological well-being. The risk factors for poor mental health include an uncertain asylum status, living in shared asylum accommodations, separation from the nuclear family, lack of German language skills, integration issues and discrimination, while employment is a protective factor.

Conclusion: Asylum seekers and refugees have high prevalence rates of psychological distress directly influenced by contextual factors in Germany. Based on these findings, policy makers are strongly recommended to apply preventive strategies to reduce mental health problems of ASRs in Germany.

Keywords: asylum seekers, refugees, mental health, well-being, post-migration, Germany, contextual factors

Edited by:
Malek Bajbouj,
Charité – Universitätsmedizin
Berlin, Germany

Reviewed by:
Trudy Mooren,
ARQ National Psychotrauma
Centre, Netherlands
Tobias Raphael Spiller,
University of Zurich, Switzerland

***Correspondence:**
Vivien L. Hajak
v.hajak@
student.medicalschool-berlin.de

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *18 December 2020*
Accepted: *23 February 2021*
Published: *18 March 2021*

Citation:
Hajak VL, Sardana S, Verdeli H and
Grimm S (2021) A Systematic Review
of Factors Affecting Mental Health and
Well-Being of Asylum Seekers and
Refugees in Germany.
Front. Psychiatry 12:643704.
doi: 10.3389/fpsyt.2021.643704

INTRODUCTION

In recent years, Europe has been challenged by the largest migration wave since the end of the Second World War (1). The dramatic increase in the number of people seeking asylum in the European Union (EU) reached its historical climax with the European refugee crisis in 2015 with ∼1.3 million applications, about twice as many as in 2014 (2–4). Between 2015 and 2019 ∼4.46 million people have sought asylum in the EU (5).

According to the United Nations High Commissioner for Refugees (UNHCR), asylum seekers are individuals who are seeking international protection, but whose application for refugee status has not yet been determined (6). Once the asylum process has been completed, an asylum seeker who has received refugee protection is referred to as a refugee recognized under the Geneva Convention (7, 8). A refugee, according to Article 1 of the Geneva Convention, is a person who has a "well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside of the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country" [1951 Refugee Convention in (9)].

Compared to other European countries, in 2015 Germany hosted the majority of individuals who sought protection through asylum [around 476,510 asylum-applications; (2)]. The requests reached their peak in 2016 at 745,545, but steadily declined from 222,683 in 2017, to 185,853 in 2018 and to 165,938 in 2019 (10). Despite the decline in total asylum applications, Germany still logs the largest share of all EU asylum claims and continues to be the third largest recipient of new asylum claims worldwide (4, 11). At the same time, Germany takes in the highest number of refugees compared to its European neighbors (12). Based on data from the Central Register for Foreigners (Ausländerzentralregister, AZR), at the end of 2019, around 1.8 million refugees were living in Germany, 1.4 million of whom held a protection status (13). The overall protection rate for refugees (the rate of approved asylum applications) was 35% in 2018 and 38.2% in 2019 (10). According to German asylum law, a residence permit which allows a stay in the country is granted by recognition of refugee status, subsidiary protection or a ban on deportation (10, 14).

Traumatic events (TEs) experienced by asylum seekers prior to and during their flight involve unmet basic needs for survival, such as regular access to water and food, shelter and medicine; fearing for one's life, the death of a loved one, and forced separation from family; witnessing acts of violence, bombing and shooting, living in a war zone; imprisonment, and living in a refugee camp (15–17). Between 50 and 85% of asylum seekers and refugees (summarized abbreviation in this article as ASRs) report at least one TE (17, 18). Exposure to TEs is a major risk factor for the development of mental disorders such as post-traumatic stress disorder (PTSD), depression and anxiety disorders among others (19–24). Greater exposure to TEs leads to more pronounced symptoms of mental disorders, especially depression and anxiety disorders (21). ASRs are therefore classified as a vulnerable population at high risk for mental stress and mental disorders (18, 25, 26).

Given the number of ASRs living in Germany and the country's high level of resources for addressing mental health needs, it is crucial for policy makers and ASR advocates to have a clear understanding of ASRs' mental health needs and priorities. However, prevalence rates of mental disorders among ASRs in Germany are inconsistent (27). Studies report prevalence rates ranging from 21.7 to 57.1% for depression, 35 to 53.3% for anxiety disorders and 13 to 34.9% for PTSD (17, 28–32). A recent study showed that about half of asylum seekers already have at least one mental disorder upon arrival in Germany (17). In comparison with the prevalence rates of the German population (33), empirical evidence indicates significantly higher rates of mental disorders among ASRs (20, 29, 31, 34). The situation of ASRs has therefore been called a mental health crisis (35).

In addition to TEs before and during migration, adaptation to a new environment (post-migration) also includes potential socioeconomic, social and interpersonal stressors, as well as migration-related barriers to legal residence in the resettlement country, that have been associated with impaired psychological functioning and poorer mental health (22, 25, 36–38). In a study by Bogic et al. (39), post-migration stressors (PMSs) were directly related to mental disorders in long-settled war refugees. More migration-related stress as well as having only a temporary residence status were predictors for higher rates of mood and anxiety disorders and PTSD. Unemployment was associated with mood disorders, and not feeling accepted by the host population was associated with higher rates of both mood and anxiety disorders. Compared with Italy and the United Kingdom (UK), refugees in Germany not only had the highest prevalence rates of mental disorders, but also reported the highest number of PMSs. This needs further examination given the studies indicating that the influence of PMSs on psychopathology might be greater than that of pre-migration experiences (40, 41).

A substantial number of studies have addressed the effect of contextual factors on the mental health and well-being of ASRs in Germany during post-migration. The heterogeneity of variables examined makes it almost impossible to not only gain an overview but also identify significant associations between these factors. Furthermore, there has been no systematic review linking the different variables investigated in these studies. This paper aims to provide the first systematic review that identifies, synthesizes and evaluates the evidence of associations between post-migration contextual factors and mental health and well-being of ASRs in Germany.

METHODS

A systematic search of empirical original studies reporting on factors affecting the mental health and well-being of ASRs in Germany was performed for this review. Throughout this process, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement for conducting and reporting systematic reviews (42) was followed except pre-registration (**Supplementary Table A1**).

Search Strategy

In March and October 2020, a systematic article search was carried out in the following medical and psychological electronic databases: APA PsycArticles (*via* Ebsco), APA PsycINFO (*via* Ebsco), CHINAL (*via* Ebsco), MEDLINE (*via* Ebsco), PubMed and PubPsych. All databases were searched using the following combination of keywords: ("factors*" AND/OR "stressors*" AND/OR "mental health*" AND/OR "well-being*") AND ("refugees*" AND/OR "asylum seekers*") AND ("Germany*"). In order to focus the search on studies reporting on mental health and well-being of ASRs after their arrival in Germany, the term "post-migration" was partly added to the search terms. The search strategies were slightly modified for each database. All searches were limited to German and English language articles published between 2015 and 2020. Additionally, the reference lists of articles were parsed to identify further potentially relevant articles.

Inclusion and Exclusion Criteria

Studies were included in the review if they: (i) investigated an adult sample of asylum seekers and/or refugees; (ii) reported on factors or quantitative estimates of mental health (e.g., depression, anxiety, PTSD) and/or reported on associative factors of well-being; (iii) were conducted in Germany, and (iv) were empirical original studies. Since international law makes a clear distinction between refugees who are forced to flee their country and migrants who voluntarily leave their country in search of better life prospects (43), only studies that examined asylum seekers and refugees were included. In accordance with the aim of this review, only articles reporting on contextual factors associated with mental health and well-being of ASRs in Germany were included. Contrary to the JBI (Joanna Briggs Institute) recommendation of limiting the search to literature published within the past 10 years (44), the detailed search strategy was instead restricted to literature which had been published within the past 5 years (since January 2015). This was done to better reflect the situation for ASRs in Germany since the beginning of the European refugee crisis. However, specific focus on a nationality was not an inclusion criterion. To obtain a comprehensive representation of current empirical knowledge and to increase the likelihood of including all essential information, there was no specification of the study design (e.g., cross-sectional, cohort) or on the study type. Thus, both quantitative and qualitative studies were included, given that the inclusion of qualitative studies in systematic reviews has become increasingly common to facilitate insight into current research (45).

Studies that provided data focusing exclusively on ASR children, adolescents or pregnant women were excluded. Due to their specific characteristics these most vulnerable subgroups within the ASR population would need to be examined separately. However, if a study examined adult ASRs together with these subgroups it was included in the review.

Study Selection

The selection of studies was carried out in a three-step procedure: (1) after eliminating duplicates, titles were screened and non-applicable articles were excluded, (2) study abstracts were screened for inclusion and exclusion criteria, and (3) remaining studies were retrieved and reviewed as full text articles for eligibility in the review.

Data Collection Process

A data key extraction sheet was developed including: (i) first author and publication year; (ii) study design; (iii) sample size; (iv) nationality; (v) gender; (vi) age; (vii) duration of stay in Germany; (viii) assessment instruments; (ix) mental health prevalence; (x) significant factors. The first author extracted the data from included studies. Disagreements were resolved by discussion between the first and the last review authors; if no agreement could be reached, it was envisaged that a third author would decide.

Quality Assessment

A critical appraisal of the risk of bias in individual studies was used to evaluate the methodological quality of included studies in terms of design, conduct, and analysis. The methodological quality of included studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for analytical cross-sectional studies, combined with a self-created question generated from the combination of three questions (items 8–10) of the JBI critical appraisal checklist for cohort studies to include assessment of follow-up procedures (46–48). The presence of each criterion was rated as "yes," "no," "unclear" or "not applicable" (46, 48, 49). The appraisal process was conducted by the first author, and, if any uncertainties were present, the articles were discussed with the last author until a consensus was reached. Articles were included in the review if they met the minimum quality of five criteria. The results of the quality assessment were used to describe the overall quality of the included studies and to score the quality of each individual study.

RESULTS

Results of Search Strategy

A total of 303 articles were identified through the systematic database searches. After removing duplicates ($n = 156$) and excluding articles whose titles did not meet the inclusion criteria ($n = 87$), the abstracts of 60 remaining articles were reviewed. The abstracts of 39 articles did not meet the inclusion criteria and thus were excluded. Full texts of the remaining 21 articles were retrieved and reviewed and another 8 articles were excluded: 6 for not meeting the inclusion criteria and 2 for not providing original data. The search thereby resulted in a total of 13 articles that met the inclusion criteria and thus were included in the systematic analysis. All included studies were published in English except for two which were published in German (50, 51). All relevant information has been translated into English. The summary of the search strategy is illustrated as a flow chart based on the PRISMA recommendation in **Figure 1** (42).

Descriptive Data of Included Studies

The studies were published between 2018 and 2020. The most commonly used study design was cross-sectional (50–59); two studies were longitudinal (60, 61) and one study used a mixed-methods design (62). All studies reported on ASRs, with the

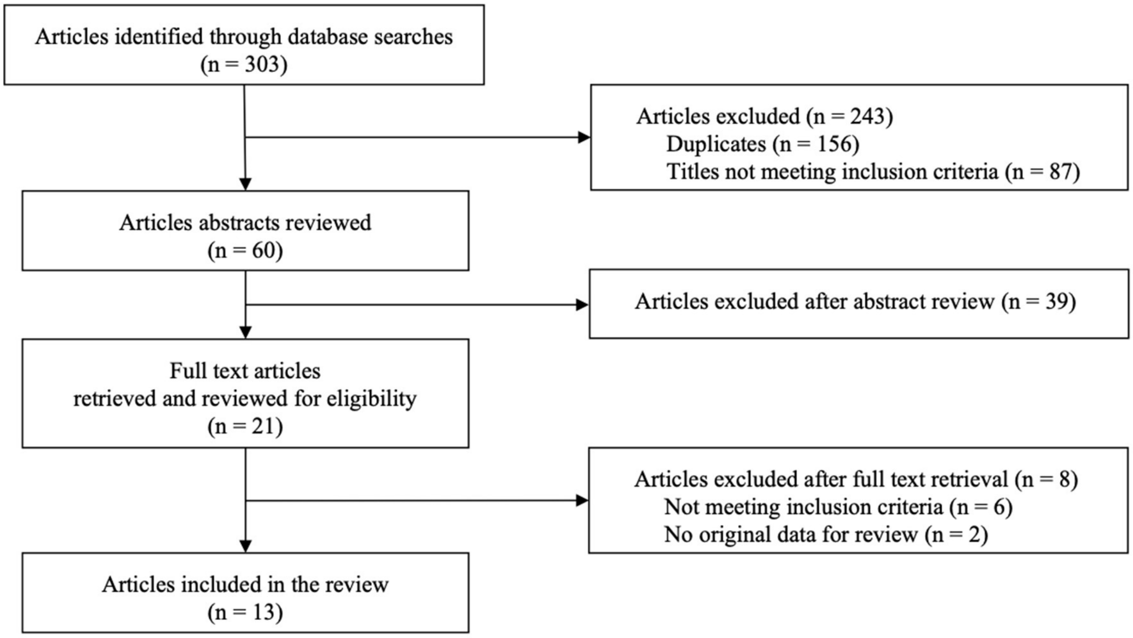


FIGURE 1 | PRISMA flow chart of study selection process.

term "asylum seekers" or "refugees" being used as a general term for both groups, regardless of their specific legal status. Sample sizes ranged from 57 participants to 6,821 participants. Most studies included different ethnic groups such as Syrian, Afghan, Iraqi and others, and ethnic groups varied among studies. Four studies focused on Syrian refugees (52, 53, 61, 62), however, in all other studies the majority of ASRs were also Syrian. In all studies reporting gender distribution, the proportion of men was higher (60.3 to 85.1%), with the exception of one study with 60.0% female participants (60). The mean age of participants ranged from 28.46 years to 36.92 years (range 12–76 years). Three studies included children, one from the age of 12 (60) and two from the age of 14 (52, 55). The duration of stay in Germany varied between 1 day to nearly 6 years. A summary of the main characteristics of included studies is provided in **Table 1**.

Prevalence of Psychological Distress

All studies used diagnostic instruments to assess mental health symptoms. Seventeen different instruments were used in these studies. In six studies, questionnaires were completed by participants (self-report) (50, 52, 53, 55, 61, 62), while the studies by Comtesse and Rosner (54) and Kaltenbach et al. (60) used semi-structured clinical interviews, and five studies conducted computer-assisted face-to-face interviews (51, 56–59). All instruments used in the studies and their validity are presented in **Supplementary Table A3**.

Depressive Symptoms

Depressive symptoms were most frequently assessed with the depression module of the Patient Health Questionnaire [PHQ-9; (53, 54, 60, 61)]. The nine-item PHQ-9 measures the severity of depressive symptoms according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) during the last past weeks on a 4-point frequency scale (0 = not at all, 3 = almost daily). The sum score ranges from 0 to 27, with a cut-off score above 10 determining clinically relevant depressive symptoms (63). Using the PHQ-9, depressive symptoms were found in 14.5 and 42.4% of the participants with females having more severe symptoms (53, 54). Kaltenbach et al. (60) utilized the PHQ-9 to assess depressive symptoms during the course of 1 year and found rates of 16.0% at first measurement, which increased to 27.0% after 6 months, but returned to the baseline rate of 16.0% after 1 year. In the study by Borho et al. (61) rates of depressive symptoms measured with PHQ-9, also showed no significant change over the course of one and a half years [26.9% (T1), 30.6% (T2)], however, females suffered significantly from more severe symptoms at the second measurement. Winkler et al. (50) found depressive symptoms in 61.3% of participants using the Hopkins Symptom Checklist 25 (HSCL-25), which is a clinical symptom checklist with 25 items used to measure the differentiated assessment of anxiety and depression as well as the resulting global mental stress (64, 65). The 2-item Patient Health Questionnaire [PHQ-2; (66)] was used in the study by Nutsch and Bozorgmehr (51), in which 19.4% of the participants showed symptoms of portable major depression (MD) during the last two weeks. El Khoury (52) used the 18-item version of the Mental Health Inventory [MHI; (67)] to evaluate the psychological experiences of participants within the past 4 weeks. On the depression subscale of the MHI-18, where higher scores from a total score of 0 to 100 indicate better mental health, females showed a depression mean score of 14.47 (SD = 4.84)

TABLE 1 | Characteristics of included studies.

References	Study design	Sample size, n	Nationality in %	Gender in %	Age in years, M (SD; range)	Duration of stay in Germany in months, M (SD; range)	Assessment instruments (mental health)	Mental health prevalence in %	Significant factors
Borho et al. (61)	Longitudinal	108	Syrian	♀ 31.5 ♂ 68.5	T1: 35.67 (10.93; 19–63) T2: 36.92 (10.81; 20–64)	T1: 22.81 (6.90; 2–50) T2: 42.02 (6.35; 18–67)	PHQ-9 GAD-7 ETI	• DEP: 26.9 (T1), 30.6 (T2) • GAD: 16.7 (T1), 15.7 (T2) • PTSD: 13.9 (T1), 13.0 (T2) • ≥1 diagnosis: 31.5 (T1), 37.0 (T2)	• Asylum status • Discrimination
Comtesse and Rosner (54)	Cross-sectional	99	Arabic: 45.4 Kurdish: 32.3 Afghan: 15.2 Other	♀ 32.3 ♂ 67.8	30.12 (9.43; 19–74)	16.56 (12.92)	PHQ-9 PCL-5 TGI-SR	• DEP: 42.4 • PTSD: 45.4 • PGD: 20.2 • PCBD: 16.1	• Asylum status
El Khoury (52)	Cross-sectional	214	Syrian (Arabic: 86.4 Kurdish: 13.6)	♀ 39.7 ♂ 60.3	≥ 14	< 10: 7.0% 11–20: 9.3% 21–30: 64.0% 31–40: 14.5% > 41: 5.0%	MHI-18	• DEP: ♀ $M = 14.47$ (SD = 4.84) • ♂ $M = 14.78$ (SD = 4.66)	• Accommodation
Georgiadou et al. (53)	Cross-sectional	200	Syrian	♀ 30.5 ♂ 69.5	33.3 (10.6; 18–63)	23.3 (6.5; 2–52)	PHQ-9 GAD-7 ETI	• DEP: 14.5 • GAD: 13.5 • PTSD: 11.4 • ≥1 diagnosis: 30.5	• Asylum status
Grochtdreis et al. (56)	Cross-sectional	6,821	Syrian: 50.0 Iraqi: 13.5 Afghan: 13.4 Other	♀ 38.9 ♂ 61.1	32.9 (10.78)	(12–48)	MCS	• $M = 47.9$	• Asylum status • Occupation
Haase et al. (55)	Cross-sectional	94	16 different (Syrian: 30.9)	♀ 14.9 ♂ 85.1	28.46 (9.58; 14–56)	11.78 (12.75; 1–50)	MIRIPS	• $M = 2.35$ (SD = 0.78)	• Accommodation • Family • Discrimination
Kaltenbach et al. (60)	Longitudinal	57	Syrian: 39.0 Afghan: 26.0 Iraqi: 7.0 Other	♀ 60.0 ♂ 40.0	30.3 (11.5; 12–56)	9.3 (6.6; 2–36)	PHQ-9 PCL-5 PSS-I	• DEP: 16.0 (t0), 27.0 (t6), 16.0 (t12) • PTSD: 32.0 (t0), 27.0 (t6), 24.0 (t12)	• Occupation • PMSs
Löbel (57)	Cross-sectional	3,400	Syrian Afghan Iraqi Other	Na	≥ 18	Na	MCS	• $M = 49.17$ (SD = 10.4; range 11.04–74.34)	• Asylum status • Accommodation • Family
Nutsch and Bozorgmehr (51)	Cross-sectional	4,465	Syrian: 49.0 Iraqi: 12.9 Afghan: 12.8 Other	♀ 37.9 ♂ 62.1	33.6 (10.4)	Na	PHQ-2 GAD-2	• MD: 19.4 • GAD: 21.5	• Asylum status • Accommodation • Occupation
von Haumeder et al. (62)	Mixed-methods	127	Syrian	♀ 33.9 ♂ 66.1	31.9 (10.68; 18–67)	23.7 (10.39; 0.5–48)	PCL-5	• PTSD: 46.5	• Accommodation • Occupation • Discrimination
Walther et al. (58)	Cross-sectional	4,325	Syrian: 41.2 Afghan: 13.9 Iraqi: 8.8 Other	♀ 26.5 ♂ 73.5	30.94 (10.47; 18–76)	1.35 years (0.71 years; 0–3.92 years)	PHQ-4	• Psych. distress: $M = 3.14$ (range 3.05–3.22)	• Asylum status • Accommodation • Occupation • Family • Language • Integration

(Continued)

TABLE 1 | Continued

References	Study design	Sample size, *n*	Nationality in %	Gender in %	Age in years, *M* (SD; range)	Duration of stay in Germany in months, *M* (SD; range)	Assessment instruments (mental health)	Mental health prevalence in %	Significant factors
Walther et al. (59)	Cross-sectional	2,569	Syrian: 44.2 Afghan: 13.6 Iraqi: 8.5 Other	♀ 25.4 ♂ 74.6	≥18	Na	RHS-13	• Psych. distress: 41.2 Mild: 19.7 Moderate: 10.6 Severe: 10.9	• Asylum status • Accommodation • Occupation • Family • Integration
Winkler et al. (50)	Cross-sectional	650	Syrian: 36.9 Afghan: 14.9 Iraqi: 8.5 Other	♀ 25.2 ♂ 74.8	30.6 (10.0)	128.3 days (177.3 days; 1–2,159 days)	HSCL-25 PDS HTQ SOMA-Scale	• DEP: 61.3 • GAD: 52.3 • PTSD: 41.7 • Somatic symptoms: 47.8 • Suicidal thoughts: 17.5 • ≥1 diagnosis: 74.6	• Asylum status • Accommodation • Integration

Na, Not applicable; n, total sample size; M, mean; SD, standard deviation; DEP, Symptoms of depression; GAD, Symptoms of generalized anxiety disorder; MD, Symptoms of major depressive disorder; PCBD, Symptoms of persistent complex bereavement disorder; PDG, Symptoms of prolonged grief disorder; PTSD, Symptoms of post-traumatic stress disorder; PMS, Post-migration stressor; T1, Initial measurement; T2, Measurement after one and a half years; t0, Baseline measurement; t6, Measurement after 6 months; t12, Measurement after 12 months; ETI, Essen Trauma Inventory; GAD-2, Generalized Anxiety Disorder-2; GAD-7, Generalized Anxiety Disorder-7; HSCL-25, Hopkins-Symptom-Checklist 25; HTQ, Harvard Trauma Questionnaire; MHI-18, Mental Health Inventory; MIRIPS, Mutual Intercultural Relations in Plural Societies; MCS, Mental Health Component Summary Scale; PCL-5, Posttraumatic Stress Disorder Checklist-5; PHQ-2, Patient Health Questionnaire-2; PHQ-4, Patient Health Questionnaire for Depression and Anxiety; PHQ-9, Patient Health Questionnaire-9; PDS, Posttraumatic Diagnostic Scale; PSS-I, PTSD Symptom Scale—Interview Version; RHS-13, Refugee Health Screener-13; SOMA-Scale, SOMA-Scale of the Symtom-Checklist-90; TGI-SR, Traumatic Grief Inventory Self-Report Version.

and males that of 14.78 (SD = 4.66), indicating high levels of depressive symptoms.

Symptoms of Anxiety

Using the Generalized Anxiety Disorder Scale [GAD-7; (68)], clinically relevant symptoms of generalized anxiety disorder (GAD) were found in 13.5% of the participants, with females having a higher severity of symptoms (53). The GAD-7 is a seven-item questionnaire measuring the severity of symptoms of GAD during the past 2 weeks (68). Although Borho et al. (61) found that GAD symptom rates remained relatively stable over one and a half years [16.7% (T1), 15.7% (T2)] using the GAD-7, stronger GAD symptoms were significantly predicted by females gender at both measurements. Using the Generalized Anxiety Disorder-2 [GAD-2; (69)], portable GAD symptoms were found in 21.5% of the participants (51). In the study by Winkler et al. (50) 52.3% of the participants showed symptoms of GAD, which was assessed with the HSCL-25.

Symptoms of Post-traumatic Stress Disorder

The Post-traumatic Stress Disorder Checklist-5 [PCL-5; (70)], which assesses the 20 DSM-5 symptoms of PTSD was used in three studies (54, 60, 62). Prevalence rates of PTSD symptoms were 45.4 and 46.5% (54, 62). While Kaltenbach et al. (60), using the PCL-5, found a PTSD symptom rate of 32.0% at initial measurement, followed by 27.0% after 6 months and 24.0% after 1 year, the PTSD symptom rate in the study by Borho et al. (61), in which the Essen Trauma Inventory [ETI; (71)] was used, hardly changed from 13.9% at initial measurement to 13.0% after one and a half years, with women having more severe PTSD symptoms at the baseline measurement. The ETI consists of items assessing potentially traumatic events as well as PTSD symptoms according to the DSM-5 (71). Also with the ETI, 11.4% of participants screened positive for clinically relevant symptoms of PTSD (53). Winkler et al. (50) assessed symptoms of PTSD through combining the Post-traumatic Diagnostic Scale [PDS; (72)], which measures the 10 ICD-10 (International Statistical Classification of Diseases and Related Health Problems) criteria of PTSD, with the 25 items of the Harvard Trauma Questionnaire [HTQ; (73)] and found a rate of 41.7% among the participants.

Other Symptoms

Somatic symptoms were investigated in only one study with a prevalence rate of 47.8% using the SOMA-scale of the Symptom-Checklist-90 (50, 74). Using the 18-item Grief Inventory Self-Report version [TGI-SR; (75)], according to the criteria of Prigerson et al. (76) and the DSM-5, symptoms of prolonged grief disorder (PGD) were found in 20.2% of the participants and that of persistent complex bereavement disorder (PCBD) in 16.1% (54). Suicidal thoughts were found in 17.5% of the participants (50). Between 30.5 and 74.6% of the participants reported symptoms of at least one psychological diagnosis (50, 53, 61). After one and a half years, 37.0% of the participants were still screened positive for symptoms of at least one psychological diagnosis (61).

General psychological distress, including symptoms of depression, anxiety, and PTSD, was identified in 41.2% of participants using the 13-item Refugee Health Screener [RHS-13; (77, 78)], with 10.6% experiencing moderate psychological distress and 10.9% experiencing severe psychological distress (59). In the study by Walther et al. (58), participants reported a mean value of 3.14 on the Patient Health Questionnaire for Depression and Anxiety [PHQ-4; (79)], indicating mild psychological distress on average in the past 2 weeks which was higher than the mean score of 1.76 previously determined as the rate for the general German population (80). On the Mental Health Component Summary Scale (MCS), which indicates "a state of mental health well-being" with a total score from 0 to 100, with higher scores indicating better mental health, mean scores of 47.9 and 49.17 were recorded, indicating lower mental health on average, especially among females ($M = 46.1$), than in the host population (56, 57). Participants received a mean score of 2.35 ($SD = 0.78$) out of a total score between 1 and 5 on the Mutual Intercultural Relations in Plural Societies [MIRIPS; (81)] questionnaire, also indicating more mental health problems (55).

Contextual Factors

Seven significant contextual factors related to mental health and well-being were extracted from the included articles: asylum status, accommodation, occupation, family, language, integration and discrimination.

Asylum Status

Nine studies reported that asylum status was a significant predictor of mental health or well-being of ASRs in Germany. In contrast, one study found no connection between depression or PTSD and asylum status (60).

Waiting for an asylum decision contributed significantly to the deterioration of mental health (57). Participants who were waiting for a decision on their initial asylum application or were in appeal against a rejected asylum application, had significantly higher levels of psychological distress, lower mental health-related quality of life (HrQoL) and lower life satisfaction than those who received a positive decision regarding their asylum application (56, 58). Simultaneously, waiting for an asylum decision was associated with higher symptom rates of PGD (20.7% first application, 37.5% in appeal), PCBD (20.7% first application, 25.0% in appeal) and PTSD (55.1% first application, 59.3% in appeal) compared to having already received a residence permit (54). Participants with a pending or rejected application had a 1.76 times (range 1.52–2.05) higher risk of showing depressive symptoms than those with a recognized asylum application (51). Thereby, the subjective feeling of having waited a long time for an asylum hearing, regardless of the actual length of stay in Germany, was significantly associated with depressive symptoms (50). The chances of depressive symptoms were lower when the official hearing had already taken place (51). There was also a significant connection between depressive, GAD and PTSD symptoms and the participants' impression that not all asylum-relevant details were being communicated at the hearing (50).

Compared to participants who were waiting for an asylum decision or who were in appeal against it, those with a temporary residence permit were significantly more likely to report depressive symptoms (57.8%) but also reported lower PGD (5.2%) or PTSD (26.3%) symptom levels (54). However, a shorter duration of the residence permit's validity associated with report of more severe PTSD symptoms (53, 61). Similarly, a temporary residence permit was associated with more impairments due to PTSD symptoms compared to a temporary suspension of deportation or a border crossing certificate, but with less somatic symptoms (50).

The uncertain legal status of a subsidiary protection or a temporary suspension from deportation, both residence permits for 1 year, was significantly associated with report of psychological distress compared to participants with a granted residence status, with males reporting greater psychological distress (58, 59). Compared to a subsidiary protection, a temporary suspension from deportation was also associated with lower mental HrQoL (56).

Participants who received a border crossing certificate and were therefore directly threatened by deportation, reported significantly higher mean values of depressive symptoms than those with a temporary suspension of deportation or any other status (50).

Accommodation

Eight studies established a significant association between mental health or well-being of ASRs and their accommodation, while two studies found no such association (53, 60).

The quality of residence contributed up to 20.0% toward mental health (52) and, at the same time, the probability of depressive symptoms decreased with increasing housing satisfaction (51).

In a study using mix-methods, participants described housing issues to be the most challenging. Of all the participants reporting PTSD symptoms, only 26.5% were satisfied with their current housing situation, compared to 73.5% of those without PTSD. Simultaneously, only 35.0% of participants reporting PTSD symptoms confirmed that they had "enough food to eat" (compared to 65.0% of participants without PTSD) and 30.2% confirmed that they had "enough money to function well on a daily basis" (compared to 69.8% without PTSD). Therefore, the participants' unmet need for housing, food and sufficient money for essential daily expenses were associated with endorsement of PTSD symptoms (62).

Compared to living in private accommodations, living in shared accommodations proved to be a significant PMS associated with deteriorating mental health (57). Living in shared asylum accommodations was associated with an increase in reported psychological distress (55, 59). Additionally, refugees living in asylum centers experienced more instances of discrimination than those living in independent apartments, which, in turn, also contributed significantly to psychological problems (55) (see section Discrimination).

Conversely, refugees living in private or independent accommodations had better mental health as indicated by higher mental health scores on the MHI-18 (52), significantly lower levels of psychological distress and higher levels of life satisfaction than those living in shared refugee housing facilities (58).

Winkler et al. (50) pursued a more differentiated approach to different types of accommodations. Participants living in emergency accommodations such as schools, large aircraft halls or gymnasiums reported significantly more symptoms of depression, anxiety and PTSD, while the subjective quality of life was perceived as better in established initial reception centers and shared accommodations with small rooms or flats, both of which had experienced social work staff.

Occupation

While two studies (52, 57) found no significant effect of occupation on the mental health and well-being of ASRs, six studies found a significant impact.

The failure to meet employment needs was associated with PTSD symptom report as only 29.5% of participants with PTSD confirmed that they had access to education, skills training or employment programs compared to 70.5% of participants without PTSD. In the qualitative results, participants reported that unemployment, or employment below their occupational level led to "lower self-esteem, frustration and despair" (62).

A regular occupation such as work, school or apprenticeship was associated with lower psychological distress (60). Employed participants had significantly higher MCS scores indicating better mental health than unemployed participants and vice versa (56). The risk of depression was also almost twice as high among unemployed participants compared to those in employment (51).

A gender-specific effect showed that employment was linked to a reduction of psychological distress only among employed men (58). At the same time, psychologically distressed men had a strongly reduced probability of being employed or participating in educational programs. Psychologically distressed females, in particular, were less likely to participate in educational programs (59).

Family

Four studies identified the significance of family relationships with mental health and well-being of ASRs in Germany. A study by Haase et al. (55) showed that living alone was associated with more psychological problems compared to living with a family. Similarly, the study by Löbel (57) showed deterioration of mental health if the nuclear family (a partner or at least one minor child) did not live in the same location in Germany. This effect was even more pronounced if all members of the nuclear family lived abroad. If an adult child lived somewhere in Germany, the parents' mental health was lightly better compared to the mental health of parents whose children did not reside in Germany (57). Men who lived in Germany without their nuclear family were ∼1.34 times more likely to report psychological distress than those who had their complete nuclear family in Germany (59). When seeking family reunion, men also showed higher levels of psychological distress and lower life satisfaction (58).

Language

Although studies by El Khoury (52) and Nutsch and Bozorgmehr (51) found that a command of the German language had no significant impact on mental health, they mentioned that many participants felt that learning German was the greatest obstacle to adapting to life in Germany. The only quantitative results from Walther et al. (58) associated better German language skills with lower levels of psychological distress and increased life satisfaction, especially among men.

Integration

The occurrence of psychological symptoms correlated significantly with lower attendance of German language courses, lower participation in sports activities, worse orientation to the surroundings, as well as a more pronounced sense of lacking support and feeling like a stranger (50). Similarly, for men, participation in integration courses was associated with a lower degree of psychological distress, although this effect was small (59). In contrast, lower levels of psychological distress and higher levels of life satisfaction among females were associated with the length of time spent with German natives (58). Conversely, other studies did not confirm that the interaction of participants with their host society (55), the number of German friends (52) or the context of reception (perceived kindness, feeling welcome, opportunities within the host country) (55) were predictors of mental health. The study by Nutsch and Bozorgmehr (51) showed that with increased loneliness, the chance of depressive symptoms also increased overall.

Discrimination

A significant association between discrimination and PTSD was found by one study where only 29.5% of participants with PTSD felt like they were treated fairly in their new community, compared to 73.5% of participants without PTSD. Confrontations with stereotypes and discrimination were also mentioned as being both frustrating and an obstacle to positive psychological adaptation (62). The level of perceived discrimination was also associated with psychological distress, particularly depressive and GAD symptoms (55, 61). One study did not find a relationship between the perception of discrimination by the host society and the mental health of ASRs (52).

Cumulative Post-migration Stressors

Overall, participants who experienced more PMSs showed an increase in PTSD symptoms and vice versa (60).

Quality/Risk of Bias

The results of the assessment of methodological quality for each study are provided in **Supplementary Table A2**. Overall, all studies met the minimum methodological quality and were therefore included in the review. Three studies were assigned to be at risk of selection bias within the study sample due to differences between responders and non-responders. Responders were older (53, 56), although in one study this was only the case at the second measurement (61), more often had Syrian nationality (56). Non-responders, on the other hand, had higher levels of psychological distress, such as high severity of PTSD symptoms (53, 61). Similarly, prevalence rates of mental health symptoms might have been underestimated. The sampling procedure in the IAB-BAMF-SOEP survey, whose data was used in three studies, might have resulted in a high risk of selection bias in favor of participants with higher levels of mental health and well-being, as is generally expected in population-based surveys (57–59). In two studies, subjects with more severe mental health symptoms were even completely excluded from study participation (50, 60). The lack of availability of survey instruments in all required languages might also have led to selection bias, as subjects who did not understand any of these languages were excluded (50, 51, 55). In addition, the results might have been biased by an unequal distribution of a variable within the study sample, such as a larger number of study participants residing in refugee establishments (52). All studies identified confounding factors such as gender, age or country of origin, but only five stated strategies to deal with these (52, 57–59, 61) and thus confounding biases could affect the results of the remaining eight studies. In general, all studies used validated instruments to assess psychological symptoms and appropriate statistical methods to determine outcomes. However, the self-report measures used in six studies (50, 52, 53, 55, 61, 62) might have biased the reported prevalence rates of psychological symptoms through effects of social desirability as one example (61). Similarly, respondents' answering behavior in semi-structured clinical interviews (54, 60) and computer-assisted face-to-face interviews (51, 56–59) might have been biased by social desirability, an assumed connection to the asylum hearings or the interviewer or interpreter. The study samples of three studies (51, 54, 61) had good comparability of characteristic with the general refugee population in Germany and were therefore representative. In contrast, conditions in the study samples of three studies (52, 55, 62) were not fully representative, implying limited generalizability to the lager population of refugees. Nevertheless, the results provide valuable insight into the current situation of the refugee population in Germany. Overall, the quality of the studies is adequate, but the heterogeneity of outcome measures across studies might display a risk of bias. Furthermore, the keywords and search terms might not have identified all relevant available data on the topic, which could represent an evidence selection bias.

DISCUSSION

This is the first systematic review demonstrating the significant influence of contextual factors during post-migration on the mental health and well-being of ASRs in Germany since the beginning of the European refugee crisis. Seven key contextual factors that are significantly associated with mental health and well-being of ASRs were extracted from the 13 articles included: Asylum status, accommodation, occupation, family, language, integration and discrimination.

Prevalence of Psychological Distress

As confirmed in several other countries (20, 22, 82, 83) and by a recent systematic review and meta-analysis (84), the prevalence rates of psychological distress, particularly depressive symptoms (14.5 to 61.3%), GAD symptoms (13.5 to 52.3%) and PTSD symptoms (11.4 to 46.5%) are heterogeneous among the ASRs in this review, but high and persistent over time compared to the German population (33). The discrepancies found in this review could be explained by the use of a variety of 17 assessment instruments or by the different living conditions of ASRs that emerge as risk or protective factors. The included study by Georgiadou et al. (53) found comparatively low prevalence rates of depressive (14.5%), GAD (13.5%) and PTSD symptoms (11.4%) which might be due to the fact that only moderate to severe levels of depressive and GAD symptoms were described. These low prevalence rates were also seen as confirming the protective influence of positive contextual factors as all refugees in this sample lived in good conditions.

The persistently high prevalence rates of psychological distress present among ASRs in Germany raise the pressure for early professional psychosocial support and specific intervention programs for mental health issues. Although Germany is internationally obligated to provide medical assistance to asylum seekers immediately upon arrival according to §4 Asylum Seekers Benefits Act (AsylbLG), asylum seekers have only a limited entitlement to "necessary" treatment for "acute illnesses and pain illnesses and pain conditions" during the first 18 months of their stay (85, 86). While psychiatric treatment is part of acute care, psychotherapy is generally not included in the scope of benefits under the Asylum Seekers Benefits Act (AsylbLG) and must therefore be approved by the social authority (87). In addition to these legal barriers, several other administrative, linguistic and cultural barriers [e.g., language difficulties, delayed or missing cost coverage for language mediation, bureaucratic hurdles, increased costs, limited care capacities, long waiting times, (asylum-related) interruption of diagnostic and therapeutic processes, discrimination] impede access to adequate psychotherapeutic care provided for asylum seekers in Germany (86, 88). Overall, asylum seekers report poorer health compared to data from the German population, but, at the same, time they report lower utilization of health care, which may bring the influence of contextual factors even more to the fore (89).

Asylum Status

Asylum status proves to be one of the most pressing post-migration stressors for the mental health and well-being of ASRs in Germany, thereby confirming several previous studies (83, 90). The mean duration of asylum procedures of initial and follow-up applications in Germany is 8 months (91). During this time, asylum seekers have to cope with uncertainty about the outcome of intensive legal proceedings over which they have little to no control and which are, at the same time, essential for their integration and future life (92). This presents an additional burden on asylum seekers during the migration phase in all countries worldwide (25). The extended duration of asylum procedures has been shown to significantly deteriorate mental health and lower the quality of life of asylum seekers (19, 93–95), which is confirmed by the results of this review. Compared to holding a residence permit, waiting for an asylum decision is associated with higher levels of depressive, PTSD, PGD, and PCBD symptoms as well as lower mental HrQoL and lower life satisfaction. The study by Silove et al. (96) showed that symptoms of depression, PTSD, anxiety and mental health functioning improved in asylum seekers who had been granted a residence permit. While we show that a temporary residence permit is significantly associated with higher rates of depressive symptoms, it is, however, associated with less severe PTSD and PGD symptoms. A longer duration of the residence permit is associated with less severe PTSD symptoms. In contrast, compared to a temporary suspension of deportation or a border crossing certificate, a temporary residence permit is associated with more impairment due to PTSD symptoms. This is in line with the results of Steel et al. (97) who found that temporary protection, as well as its validity contribute to greater stress due to the fear of repatriation and the persistence of psychiatric disorders such as depression, PTSD and mental health-related disabilities in Arab-speaking refugees from Mandaean in Sydney. Bogic et al. (39) complement these findings by linking temporary residence status to higher rates of mood and anxiety disorders. When temporary residence status was changed to permanent residence status, the study by Nickerson et al. (98) showed an improvement in depression, PTSD symptoms and quality of life. In this current review, compared to a granted residence status, the uncertain subsidiary protection or temporary suspension from deportation is associated with psychological distress, with men being more distressed. A suspension from deportation also predicts a lower mental HrQoL. Refugees who received a border crossing certificate have significantly higher mean values of depressive symptoms. Along that line, Raghavan et al. (99) found that receiving asylum status, and therefore a secure legal status, had the greatest effect in reducing the severity of symptom among asylum seekers. All these findings contrast to the study by Kaltenbach et al. (60), included in this review, which found no significant evidence for an association between PTSD and depression with asylum status at the first measurement. However, because the majority of refugees in the study by Kaltenbach et al. (60) were still in the first stage of their asylum application, it is plausible that this status did not yet affect their mental health.

Accommodation

Another major determinant of mental health and well-being of ARSs in Germany is accommodation, as highlighted by the included study by El Khoury (52), which estimated its contribution to mental health at up to 20.0%. ASRs living in emergency accommodations report significantly more frequent symptoms of depression, GAD and PTSD, while the subjective quality of life is perceived as better in established initial reception centers and shared accommodations. While living in a shared asylum accommodation proves to be a significant PMS deteriorating mental health, especially among men, and to be linked to more received discrimination, living in a private or independent accommodation is associated with better mental health and higher life satisfaction. Overall, the more satisfied ASRs are with their housing, the less likely they are to show symptoms of depression and PTSD. Although no conclusions can be drawn from the study by Richter et al. (100), it proved that the majority of refugees (63.6%) living in a Bavarian central refugee reception facility were suffering from one or more psychiatric disorders. International research largely confirms that living in shared institutions is connected to poor mental health amongst refugees (101). A systematic review and meta-analysis by Steel et al. (21), which included 40 countries, showed that refugees who were living in refugee camps had higher rates of depression than those resettled to high-income countries. Compared to Yugoslav refugees living in Italy and the UK, those living in Germany experienced the highest number of PMSs, including inadequate accommodation (39). The meta-analysis by Porter and Haslam (40) both confirms and expands these findings by concluding that refugees living in permanent private accommodation have significantly better mental health than those living in institutional and temporary accommodation. In two included studies, no correlation between mental health and living situation was found, which could be due to the fact that one had a comparatively small sample size (53) and the other sampled refugees who mostly lived in good conditions (60).

Occupation

The current review offers indication that occupation is a protective factor for mental health and well-being in ASRs. Occupation such as work, school or apprenticeship is significantly associated with fewer depressive and PTSD symptoms and better overall mental HrQoL. International research confirms and complements these findings by linking unemployment with higher rates of mental disorders (19, 22, 37, 39, 102–105). This review also shows that employment status has a particular impact on the mental health of men, as those who suffer from psychological distress are less likely to be employed and, conversely, those who are employed have less psychological distress. Distressed men and women in particular are also less likely to participate in educational programs. Similarly, unemployment has been found to be a strong risk factor for the development of depression in males (102). A meta-analysis summarized that restricted work rights and employment prospects leading to restricted access to economic opportunities (106) deteriorate mental health in refugees world-wide (40). In contrast, a recently published study by Jannesari et al. (90) only found a weak positive association between unemployment and mental disorders.

Family

Separation from the family is identified as a predictor of mental health deterioration among ASRs by the current review. Men who live in Germany without their nuclear family are 1.34 times more likely to experience psychological distress and lower life satisfaction if they are seeking family reunion. The negative effects of family separation on mental health have been demonstrated in a number of international studies where refugees isolated from their families living abroad were more likely to report psychiatric disorders such as depression and PTSD (97, 103, 104). Our findings are strengthened by the results of a study of Latin American and African refugees in Canada by Rousseau et al. (107), who found that seeking family reunification mitigates the link between past personal trauma exposures and psychological suffering. There are a number of hypotheses on what makes the separation from the family so critical. A study of Mandaean refugees from Iraq living in Sydney showed that not only the separation from the family, but also fearing for the safety of family members who were still living in their country of origin, was correlated with higher levels of depression, PTSD and increased mental health disability (108).

Language

Integration into a host country also depends on social aspects that appear essential for adapting to life in Germany. Steel et al. (103) found poor host language proficiency to be one of the most significant risk factors for mental disorders. Similarly, this review indicates that better German language skills reduce the level of psychological distress and increase life satisfaction, especially among men. In a longitudinal study in Canada, the lack of English language skills had no influence on the mental health of Southeast Asian refugees at first, but it was a significant predictor for depression after a period of 10 years. Contrary to the German data in this review, this was particularly seen in women. This effect may be due to the fact that women were less likely to receive English language training and were therefore at higher risk of isolation (102). A systematic literature review associated poor post-migration economic factors, including a poor host language proficiency, with depression (22). Language difficulties also constituted a barrier to accessing mental health and psychosocial support (MHPSS) services (109).

Integration

It is highly likely, but not proven, that proper language skills may influence the quality of contact between ARSs and the German host population. The current review shows that the deciding factor is not how many German friends ARSs have, but rather how much time they actually spend with the German host society. Spending more time with German natives is significantly associated with higher levels of life satisfaction and lower levels of psychological distress, particularly among women. Also, less participation in activities such as German language courses or sports is associated with more psychological symptoms. A study by Silove et al. (19) showed that social isolation, described as loneliness among refugees, is linked with depression, anxiety and PTSD. Even after more than 10 years of residence in Switzerland, psychological symptoms among refugees were associated with poor integration (110), which emphasizes the importance of this factor, especially with regard to long-term integration.

Discrimination

At the same time, social integration depends on the acceptance of the ASRs' demands for equal rights. The acceptance of ASRs in Germany is markedly influenced by discrimination when one takes into account the society's irrational fears regarding people of different color and culture (111). The current review demonstrates that depressive, GAD and PTSD symptoms are associated with increased discrimination experiences by ASRs. This association was also shown by Kim (105), with refugees who experienced discrimination on a daily basis being more likely to suffer from depression. In the included study by El Khoury (52), only a small percentage of participants actually experienced discrimination, which may have resulted in no association found between discrimination and mental health.

Limitations

Despite the significance of the data analyzed in this review, a number of limitations should be acknowledged when interpreting our findings. The review was not pre-registered. Furthermore, based on the search terms defined here, it cannot be excluded that all relevant studies were found, which, in turn, might have biased the review results. The included studies differed greatly in terms of sample size, nationalities of included participants, duration of stay in Germany and the instruments used. This heterogeneity, for specific subgroups in particular, made it difficult to put the studies into a valid and reliable context. Therefore, vulnerable subgroups of ASRs such as children, adolescents or pregnant women were excluded from the review. In a study conducted in Berlin, 7.0% of 164 refugee women surveyed were pregnant (112), but all researchers agreed that there is a major knowledge gap regarding research on this group (88). According to statistics from January to March 2020, minors accounted for about half of the asylum seekers in Germany (113). Consequently, the exclusion of these subgroups limits the generalizability of the published results to the entire ASRs population in Germany and requires particular attention in future research. Furthermore, the attempt to identify gender-specific differences could only be fulfilled to a limited extent due to unexamined interactions between PMSs and sex in the included studies. In addition, while women have been seen as more vulnerable in other studies on ASRs (97, 103, 104), the proportion of male participants was predominant in all included investigations, except for one. Even though this gender imbalance is representative for the German ASR population (10), it could influence the outcomes and cause distortions as gender differences in mental disorders have been identified *per-se* (114) and among ASRs in earlier literature (22, 115). Furthermore, we did not analyze the extent to which mental health outcomes can be associated with the nationality of ASRs, although different nationalities were examined as an independent variable in some studies. The focus on the Syrian refugee population in some studies could be explained by the fact that this group constitutes the largest one in Germany (113, 116). In order to successfully prevent the development or manifestation of psychological distress among ASRs in Germany, the development of culturally sensitive prevention measures could be crucial, and this aspect should therefore be given careful attention in future research. Another question that arises when interpreting the current results is what influence the duration of stay in Germany, which varied widely across the included studies, has on mental health. For example, Richter et al. (31) observed an increase in the prevalence of PTSD among asylum seekers studied in Bavaria between the initial measurement and the follow-up measurement 6 months later, with no evidence of additional traumatic events. Although the included study by Walther et al. (58) found that psychological distress decreased and life satisfaction increased with longer time stayed in Germany, this could not be confirmed by the majority of the included studies. The primary weakness of the included studies lies in the use of different instruments to assess mental health which, in particular, accounts for rather different prevalence rates of the identified mental disorders. Also, the method of data collection in the included data could make results questionable as they could be influenced by social desirability effects, language difficulties or different cultural understandings of terms describing psychological symptoms and therefore might lead to incorrect responses in the questionnaires and interviews. Moreover, due to their cross-sectional design, the majority of the study results do not allow for proof of causality and valid conclusions regarding the direct and causal relationship between post-migration factors and mental health of the surveyed population.

CONCLUSION

This systematic review of the current literature demonstrates that ASRs in Germany are at high risk for mental health symptoms and lowered levels of well-being, both of which are associated with contextual factors. Post-migration stressors include uncertainties during the asylum process, living in shared asylum accommodations, separation from the family, poor German language skills and a lack of integration and discrimination which all contribute to the deterioration of mental health. In contrast, occupation is a protective factor. The findings thereby suggest the implementation of standardized and careful psychiatric screening of all representative groups of ASRs upon arrival in Germany and, as recommended by Richter et al. (31), repeated measurements after a certain period of time to better identify the validity and specificity of causal and coping factors. In line with the World Health Organizations demand (117), policy makers should use preventive strategies to improve mental health and well-being. These activities should consist of better structured asylum procedures, decentralized accommodation, improved access to the labor market, reunion of nuclear family members, offering more and individual language courses, improving contact with German nationals and anti-discrimination programs for ASRs as well as for the host population.

AUTHOR CONTRIBUTIONS

VH performed the systematic literature research, article selection, data extraction and created the first draft of the manuscript including the introduction, methods, results, and discussion. SG gave feedback and made essential corrections. HV and SS suggested crucial improvements. All of the authors contributed to the final manuscript and submission.

ACKNOWLEDGMENTS

We would like to thank Dr. Elke Kuntner (psychiatrist) and Jürgen Wolf (head of AEO) from the ANKER-Einrichtung Oberfranken (AEO) for the helpful insights into the everyday life of asylum seekers and refugees, which decisively influenced the structuring of this paper. We are also very grateful for the critical comments from a clinical psychiatric perspective by Prof. Dr. Göran Hajak. We thank Paul Kowalski for the English proofreading.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.643704/full#supplementary-material

REFERENCES

1. European Parliament. *Europe's Migration Crisis*. (2019). Available online at: https://www.europarl.europa.eu/news/en/headlines/society/20170629STO78631/europe-s-migration-crisis (accessed November 16, 2019).
2. BAMF. *Migrationsbericht des Bundesamtes für Migration und Flüchtlinge im Auftrag der Bundesregierung: Migrationsbericht 2015*. (2015). Available online at: https://www.bamf.de/SharedDocs/Anlagen/DE/Forschung/Migrationsberichte/migrationsbericht-2015.pdf?__blob=publicationFile (accessed March 19, 2020).
3. Europäische Kommission. *Die EU und die Flüchtlingskrise*. (2016). Available online at: https://ec.europa.eu/germany/sites/germany/files/na0416628den_002.pdf (accessed March 19, 2020).
4. Eurostat. *Asylum Statistics* (2019). Available online at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Asylum_statistics (accessed March 19, 2020).
5. Eurostat. *Asylum Statistics*. (2020). Available online at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Asylum_statistics (accessed November 7, 2020).
6. UNHCR. *Global Trends: Forced Displacement in 2016* (2017). Available online at: https://www.unhcr.org/5943e8a34.pdf (accessed November 5, 2019).
7. BAMF. *Ablauf des deutschen Asylverfahrens: Ein Überblick über die einzelnen Verfahrensschritte und rechtlichen Grundlagen*. (2019). Available online at: https://www.bamf.de/SharedDocs/Anlagen/DE/AsylFluechtlingsschutz/Asylverfahren/das-deutsche-asylverfahren.pdf?__blob=publicationFile&v=12 (accessed August 22, 2019).
8. BAMF. *Flüchtlingsschutz*. (2019). Available online at: https://www.bamf.de/DE/Themen/AsylFluechtlingsschutz/AblaufAsylverfahrens/Schutzformen/Fluechtlingsschutz/fluechtlingsschutznode.html;jsessionid=412D31799B5C405AC3D7B51EFDC62673.internet561 (accessed November 26, 2020).
9. UNHCR. *Convention and Protocol Relating to the Status of Refugees*. (1978). Available online at: https://cms.emergency.unhcr.org/documents/11982/55726/Convention+relating+to+the+Status+of+Refugees+%28signed+28+July+1951%2C+entered+into+force+22+April+1954%29+189+UNTS+150+and+Protocol+relating+to+the+Status+of+Refugees+%28signed+31+January+1967%2C+entered+into+force+4+October+167%29+606+UNTS+267/0bf3248a-cfa8-4a60-864d-65cdfece1d47 (accessed November 5, 2019).
10. BAMF. *Asylgeschäftsstatistik: Aktuelle Zahlen. Ausgabe: Januar 2020. Tabellen Diagramme Erläuterungen*. (2020). Available online at: https://www.bamf.de/SharedDocs/Anlagen/DE/Statistik/AsylinZahlen/aktuelle-zahlen-januar-2020.pdf?__blob=publicationFile&v=3 (accessed March 7, 2020).
11. UNHCR. *Global Trends: Forced Displacement in 2018*. (2019). Available online at: https://www.unhcr.org/5d08d7ee7.pdf (accessed November 5, 2019).
12. EASO. *Annual Report on the Situation of Asylum in the European Union 2018*. (2019). Available online at: https://www.easo.europa.eu/sites/default/files/easo-annual-report-2018-web.pdf (accessed November 15, 2019).
13. Deutscher Bundestag. Drucksache 19/21460. *Zahlen in der Bundesrepublik Deutschland lebender Flüchtlinge zum Stand 30*. (2020). Available online at: https://dip21.bundestag.de/dip21/btd/19/224/1922457.pdf (accessed November 7, 2020).
14. BAMF. *Schutzformen*. (2020). Available online at: https://www.bamf.de/DE/Themen/AsylFluechtlingsschutz/AblaufAsylverfahrens/Schutzformen/schutzformennode.html (accessed November 15, 2020).
15. Brücker H, Rother N, Schupp, Jr., von Gostomski CB, Böhm A, Fendel T, et al. Forced migration, arrival in Germany, and first steps toward

integration. *DIW Econ Bull*. (2016) 6:541–56. Available online at: http://hdl.handle.net/10419/148611

16. Sigvardsdotter E, Vaez M, Hedman A-M, Saboonchi F. Prevalence of torture and other war- related traumatic events in forced migrants: a systematic review. *J Rehabil Torture Victims Prevent Torture*. (2016) 26:41–73. doi: 10.1163/2210-7975_hrd-9921-2016014
17. Nesterko Y, Jäckle D, Friedrich M, Holzapfel L, Glaesmer H. Prevalence of post-traumatic stress disorder, depression and somatisation in recently arrived refugees in Germany: an epidemiological study. *Epidemiol Psychiatr Sci*. (2019) 29:e40. doi: 10.1017/S2045796019000325
18. Ullmann E, Barthel A, Tache S, Bornstein A, Licinio J, Bornstein SR. Emotional and psychological trauma in refugees arriving in Germany in 2015. *Mol Psychiatry*. (2015) 20:1483–84. doi: 10.1038/mp.2015.164
19. Silove D, Sinnerbrink I, Field A, Manicavasagar V, Steel Z. Anxiety, depression and PTSD in asylum-seekers: assocations with pre-migration trauma and post-migration stressors. *Br J Psychiatry*. (1997) 170:351–57. doi: 10.1192/bjp.170.4.351
20. Fazel M, Wheeler J, Danesh J. Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *Lancet*. (2005) 356:1309–14. doi: 10.1016/S0140-6736(05)61027-6
21. Steel Z, Chey T, Silove D, Marnane C, Bryant RA, van Ommeren M. Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *JAMA*. (2009) 302:537–49. doi: 10.1001/jama.2009.1132
22. Bogic M, Njoku A, Priebe S. Long-term mental health of war-refugees: a systematic literature review. *BMC Int Health Hum Rights*. (2015) 15:29. doi: 10.1186/s12914-015-0064-9
23. Böttche M, Heeke C, Knaevelsrud C. Sequenzielle Traumatisierungen, Traumafolgestörungen und psychotherapeutische Behandlungsansätze bei kriegstraumatisierten erwachsenen Flüchtlingen in Deutschland. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*. (2016) 59:621–26. doi: 10.1007/s00103-016-2337-4
24. DGPPN. *Positionspapier: Psychosoziale Versorgung von Flüchtlingen verbessern*. (2016). Available online at: https://www.dgppn.de/_Resources/Persistent/c03a6dbf7dcdb0a77dbdf4ed3e50981431abe372/2016_03_22_DGPPN-Positionspapier_psychosoziale%20Versorgung%20Fl%C3%BCchtlinge.pdf (accessed November 16, 2019).
25. Miller KE, Rasmussen A. The mental health of civilians displaced by armed conflict: an ecological model of refugee distress. *Epidemiol Psychiatr Sci*. (2017) 26:129–38. doi: 10.1017/S2045796016000172
26. Hruschka C, Leboeuf L. Vulnerability: a buzzword or a standard for migration governance. *Policy Brief*. (2019) 20:1–4. Available online at: https://pure.mpg.de/
27. Turrini G, Purgato M, Ballette F, Nosè M, Ostuzzi G, Barbui C. Common mental disorders in asylum seekers and refugees: umbrella review of prevalence and intervention studies. *Int J Mental Health Syst*. (2017) 11:51. doi: 10.1186/s13033-017-0156-0
28. Führer A, Eichner F, Stang A. Morbidity of asylum seekers in a medium-sized German city. *Eur J Epidemiol*. (2016) 31:703–06. doi: 10.1007/s10654-016-0148-4
29. Georgiadou E, Morawa E, Erim Y. High manifestations of mental distress in arabic asylum seekers accommodated in collective centers for refugees in germany. *Int J Environ Res Public Health*. (2017) 14:612. doi: 10.3390/ijerph14060612
30. Kaltenbach E, Hardtner E, Hermenau K, Schauer M, Elbert T. Efficient identification of mental health problems in refugees in Germany: the refugee health screener. *Eur J Psychotraumatol*. (2017) 8(Suppl. 2):1389205. doi: 10.1080/20008198.2017.1389205
31. Richter K, Peter L, Lehfeld H, Zaske H, Brar-Reissinger S, Niklewski G. Prevalence of psychiatric diagnoses in asylum seekers with follow-up. *BMC Psychiatry*. (2018) 18:206. doi: 10.1186/s12888-018-1783-y
32. Biddle L, Menold N, Bentner M, Nost S, Jahn R, Ziegler S, et al. Health monitoring among asylum seekers and refugees: a state-wide, cross-sectional, population-based study in Germany. *Emerg Themes Epidemiol*. (2019). 16:3. doi: 10.1186/s12982-019-0085-2
33. Jacobi F, Höfler M, Strehle J, Mack S, Gerschler A, Scholl L, et al. Erratum zu: Psychische Störungen in der Allgemeinbevölkerung. Studie zur Gesundheit Erwachsener in Deutschland und ihr Zusatzmodul "Psychische Gesundheit" (DEGS1-MH). *Nervenarzt*. (2016) 87:88–90. doi: 10.1007/s00115-015-4458-7
34. Ryan DA, Kelly FE, Kelly BD. Mental health among persons awaiting an asylum outcome in Western Countries. *Int J Mental Health*. (2014) 38:88–111. doi: 10.2753/IMH0020-7411380306
35. Schauer M. The mass refugee movement—better reframed as mental health crisis? *International Society for Traumatic Stress Studies—StressPoints, a Quarterly eNewsletter* (2016). p. 1. doi: 10.13140/RG.2.1.4113.1926
36. Priebe S, Jankovic Gavrilovic J, Bremner S, Ajdukovic D, Franciskovic T, Galeazzi GM, et al. Psychological symptoms as long-term consequences of war experiences. *Psychopathology*. (2013) 46:45–54. doi: 10.1159/000338640
37. Li SSY, Liddell BJ, Nickerson A. The relationship between post-migration stress and psychological disorders in refugees and asylum seekers. *Curr Psychiatry Rep*. (2016) 18:82. doi: 10.1007/s11920-016-0723-0
38. Priebe S, Giacco D, El-Nagib R. *Public Health Aspects of Mental Health Among Migrants and Refugees: A Review of the Evidence on Mental Health Care for Refugees, Asylum Seekers and Irregular Migrants in the WHO European Region*. Geneva: World Health Organization. Regional Office for Europe (2016).
39. Bogic M, Ajdukovic D, Bremner S, Franciskovic T, Galeazzi GM, Kucukalic A, et al. Factors associated with mental disorders in long-settled war refugees: refugees from the former Yugoslavia in Germany, Italy and the UK. *Br J Psychiatry*. (2012) 200:216–623. doi: 10.1192/bjp.bp.110.084764
40. Porter M, Haslam N. Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons. *JAMA*. (2005) 294:602–12. doi: 10.1001/jama.294.5.602
41. Chu T, Keller AS, Rasmussen A. Effects of post-migration factors on PTSD outcomes among immigrant survivors of political violence. *J Immigr Minor Health*. (2013) 15:890–97. doi: 10.1007/s10903-012-9696-1
42. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. (2009) 6:e1000097. doi: 10.1371/journal.pmed.1000097
43. BMZ. *Begriffsbestimmungen und Erläuterungen. Flüchtling, Asylsuchender, Binnenvertriebener, Klimamigrant, UNHCR*. (2010–2020). Available online at: https://www.bmz.de/de/themen/Sonderinitiative-Fluchtursachen-bekaempfen-Fluechtlinge-reintegrieren/hintergrund/definition_fluechtling/index.jsp (accessed November 16, 2020).
44. Aromataris E, Fernandez RS, Godfrey C, Holly C, Khalil H, Tungpunkom P. *Methodology for JBI Umbrella Reviews*. Australia: The Joanna Briggs Institute (2014). p. 1–34.
45. Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Inform Libr J*. (2009) 26:91–108. doi: 10.1111/j.1471-1842.2009.00848.x
46. Moola S, Munn Z, Tufanaru C, Aromataris E, Sears K, Sfetcu R, et al. *Checklist for Analytical Cross Sectional Studies*. Adelaide, SA: Joanna Briggs Institute Reviewer's Manual; The Joanna Briggs Institute (2017).
47. Ma L-L, Wang Y-Y, Yang Z-H, Huang D, Weng H, Zeng X-T. Methodological quality (risk of bias) assessment tools for primary and secondary medical studies: what are they and which is better? *Mil Med Res*. (2020) 7:7. doi: 10.1186/s40779-020-00238-8
48. Moola S, Munn Z, Tufanaru C, Aromataris E, Sears K, Sfetcu R, et al. Checklist for cohort studies. Chapter 7: systematic reviews of etiology and risk. In: Aromataris E, Munn Z, editors. *Manual for Evidence Synthesis*. Adelaide, SA: JBI (2020).
49. Lockwood C, Munn Z, Porritt K. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *Int J Evid Based Healthc*. (2015) 13:179–87. doi: 10.1097/XEB.0000000000000062
50. Winkler JG, Brandl EJ, Bretz HJ, Heinz A, Schouler-Ocak M. The influence of residence status on psychiatric symptom load of asylum seekers in Germany. *Psychiatrische Praxis*. (2019) 46:191–99. doi: 10.1055/a-0806-3568
51. Nutsch N, Bozorgmehr K. Der Einfluss postmigratorischer Stressoren auf die Prävalenz depressiver Symptome bei Geflüchteten in Deutschland. Analyse anhand der IAB-BAMFSOEP-Befragung 2016. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz.* (2020) 63:1–13. doi: 10.1007/s00103-020-03238-0

52. El Khoury SJ. Factors that impact the sociocultural adjustment and well-being of Syrian refugees in Stuttgart—Germany. *Br J Guid Couns*. (2018) 47:1–16. doi: 10.1080/03069885.2018.1520196
53. Georgiadou E, Zbidat A, Schmitt GM, Erim Y. Prevalence of mental distress among syrian refugees with residence permission in germany: a registry-based study. *Front Psychiatry*. (2018) 9:393. doi: 10.3389/fpsyt.2018.00393
54. Comtesse H, Rosner R. Prolonged grief disorder among asylum seekers in Germany: the influence of losses and residence status. *Eur J Psychotraumatol*. (2019) 10:1591330. doi: 10.1080/20008198.2019.1591330
55. Haase A, Rohmann A, Hallmann K. An ecological approach to psychological adjustment: a field survey among refugees in Germany. *Int J Intercult Relat*. (2019) 68:44–54. doi: 10.1016/j.ijintrel.2018.10.003
56. Grochtdreis T, König H-H, Riedel-Heller SG, Dams J. Health-related quality of life of asylum seekers and refugees in Germany: a cross-sectional study with data from the German socio-economic panel. *Appl Res Qual Life*. (2020) 11:1–19. doi: 10.1007/s11482-020-09877-4
57. Löbel L-M. Family separation and refugee mental health—A network perspective. *Soc Netw*. (2020) 61:20–33. doi: 10.1016/j.socnet.2019.08.004
58. Walther L, Fuchs LM, Schupp J, von Scheve C. Living conditions and the mental health and well-being of refugees: evidence from a large-scale German survey. *J Immigr Minor Health*. (2020) 22:903–13. doi: 10.1007/s10903-019-00968-5
59. Walther L, Kröger H, Tibubos AN, Ta TMT, von Scheve C, Schupp J, et al. Psychological distress among refugees in Germany: a cross-sectional analysis of individual and contextual risk factors and potential consequences for integration using a nationally representative survey. *BMJ Open*. (2020) 10:e033658. doi: 10.1136/bmjopen-2019-033658
60. Kaltenbach E, Schauer M, Hermenau K, Elbert T, Schalinski I. Course of mental health in refugees—A one year panel survey. *Front Psychiatry*. (2018) 9:352. doi: 10.3389/fpsyt.2018.00352
61. Borho A, Viazminsky A, Morawa E, Schmitt GM, Georgiadou E, Erim Y. The prevalence and risk factors for mental distress among Syrian refugees in Germany: a register-based follow-up study. *BMC Psychiatry*. (2020). 20:1–13. doi: 10.1186/s12888-020-02746-2
62. von Haumeder A, Ghafoori B, Retailleau J. Psychological adaptation and posttraumatic stress disorder among Syrian refugees in Germany: a mixed-methods study investigating environmental factors. *Eur J Psychotraumatol*. (2019) 10:1686801. doi: 10.1080/20008198.2019.1686801
63. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9. *J Gen Int Med*. (2001) 16:606–13. doi: 10.1046/j.1525-1497.2001.016009606.x
64. Derogatis LR, Lipman RS, Rickels K, Uhlenhuth EH, Covi L. Psychological measurements in psychopharmacology. In: Pichot P, Olivier-Martin R, editors. *Modern Trends in Pharmacopsychiatry*. Basel: Karger (1974). p. 79–110.
65. Petermann F, Brähler E. HSCL-25. *Hopkins-Syptom-Checkliste-25. Deutsche Version. Manual*. Göttingen, Bern, Wien: Hogrefe (2013).
66. Kroenke K, Spitzer RL, Williams JB. The patient health questionnaire-2: validity of a two-item depression screener. *Med Care*. (2003) 41:1284–92. doi: 10.1097/01.MLR.0000093487.78664.3C
67. Veit CT, Ware JE. The structure of psychological distress and well-being in general populations. *J Consult Clin Psychol*. (1983) 51:730–42. doi: 10.1037/0022-006X.51.5.730
68. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Int Med*. (2006) 166:1092–97. doi: 10.1001/archinte.166.10.1092
69. Kroenke K, Spitzer R, Williams J, Monahan P, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Int Med*. (2007) 146:317–25. doi: 10.7326/0003-4819-146-5-200703060-00004
70. Blevins CA, Weathers FW, Davis MT, Witte TK, Domino JL. The posttraumatic stress disorder checklist for DSM-5 (PCL-5): development and initial psychometric evaluation. *J Trauma Stress*. (2015) 28:489–98. doi: 10.1002/jts.22059
71. Tagay S, Erim Y, Stoelk B, Möllering A, Mewes R, Senf W. Das Essener Trauma-Inventar (ETI) - Ein Screeninginstrument zur Identifikation traumatischer Ereignisse und posttraumatischer Störungen. *Zeitschrift für Psychotraumatologie Psychotherapiewissenschaft Psychologische Medizin*. (2007) 1:75–89. doi: 10.1055/s-2006-934318
72. McCarthy S. Post-traumatic Stress Diagnostic Scale (PDS). *Occup Med (Lond)*. (2008) 58:379. doi: 10.1093/occmed/kqn062
73. Mollica RF, Caspi-Yavin Y, Bollini P, Truong T, Tor S, Lavelle J. The Harvard trauma questionnaire. Validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. *J Nervous Mental Dis*. (1992) 180:111–6. doi: 10.1097/00005053-199202000-00008
74. Derogatis LR, Unger R. Symptom checklist-90-revised. In: Weiner IB, Craighead WE, editors. *The Corsini Encyclopedia of Psychology*. New Jersey, NY: Wiley (2010). p. 1–2. doi: 10.1002/9780470479216.corpsy0970
75. Boelen PA, Smid GE. The traumatic grief inventory self-report version (TGI-SR): introduction and preliminary psychometric evaluation. *J Loss Trauma*. (2017) 22:196–212. doi: 10.1080/15325024.2017.1284488
76. Prigerson HG, Horowitz MJ, Jacobs SC, Parkes CM, Aslan M, Goodkin K, et al. Prolonged grief disorder: psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Med*. (2009) 6:e1000121. doi: 10.1371/journal.pmed.1000121
77. Hollifield M, Verbillis-Kolp S, Farmer B, Toolson EC, Woldehaimanot T, Yamazaki J, et al. The refugee health screener-15 (RHS-15): development and validation of an instrument for anxiety, depression, and PTSD in refugees. *Gen Hosp Psychiatry*. (2013) 35:202–09. doi: 10.1016/j.genhosppsych.2012.12.002
78. Hollifield M, Toolson EC, Verbillis-Kolp S, Farmer B, Yamazaki J, Woldehaimanot T, et al. Effective screening for emotional distress in refugees: the refugee health screener. *J Nervous Mental Dis*. (2016) 204:469. doi: 10.1097/NMD.0000000000000469
79. Kroenke K, Spitzer RL, Williams JB, Löwe B. An ultra-brief screening scale for anxiety and depression: the PHQ-4. *Psychosomatics*. (2009) 50:613–21. doi: 10.1176/appi.psy.50.6.613
80. Löwe B, Wahl I, Rose M, Spitzer C, Glaesmer H, Wingenfeld K, et al. A 4-item measure of depression and anxiety: validation and standardization of the patient health questionnaire-4 (PHQ-4) in the general population. *J Aff Disord*. (2010) 122:86–95. doi: 10.1016/j.jad.2009.06.019
81. Centre for Applied Cross-Cultural Research. *Mutual Intercultural Relations in Plural Societies (MIRIPS)*. (2010). Available online at: https://www.wgtn.ac.nz/cacr/research/mirips (accessed December 11, 2020).
82. Heeren M, Mueller J, Ehlert U, Schnyder U, Copiery N, Maier T. Mental health of asylum seekers: a cross-sectional study of psychiatric disorders. *BMC Psychiatry*. (2012) 12:114. doi: 10.1186/1471-244X-12-114
83. Heeren M, Wittmann L, Ehlert U, Schnyder U, Maier T, Müller J. Psychopathology and resident status: comparing asylum seekers, refugees, illegal migrants, labor migrants, and residents. *Compr Psychiatry*. (2014). 55:818–25. doi: 10.1016/j.comppsych.2014.02.003
84. Blackmore R, Boyle JA, Fazel M, Ranasinha S, Gray KM, Fitzgerald G, et al. The prevalence of mental illness in refugees and asylum seekers: a systematic review and meta-analysis. *PLoS Med*. (2020) 17:e1003337. doi: 10.1371/journal.pmed.1003337
85. Bundesministerium der Justiz und für Verbraucherschutz. *Asylbewerberleistungsgesetz (AsylbLG)*. (1993). Available online at: https://www.gesetze-im-internet.de/asylblg/BJNR107410993.html (accessed January 24, 2021).
86. BAfF. *Versorgungsbericht. Zur psychosozialen Versorgung von Flüchtlingen und Folteropfern in Deutschland*. Berlin: BAfF (2020).
87. Frank L, Yesil-Jürgens R, Razum O, Bozorgmehr K, Schenk L, Gilsdorf A, et al. Health and healthcare provision to asylum seekers and refugees in Germany. *J Health Monit*. (2017) 2:24–47. doi: 10.17886/RKI-GBE-2017-021
88. Bozorgmehr K, Mohsenpour A, Saure D, Stock C, Loerbroks A, Joos S, et al. Systematic review and evidence mapping of empirical studies on health status and medical care among refugees and asylum seekers in Germany (1990-2014). *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*. (2016) 59:599–620. doi: 10.1007/s00103-016-2336-5
89. Biddle L, Hintermeier M, Baron J, Flory L, Bozorgmehr K. *Working Paper #2: Gesundheitszustand und Inanspruchnahme von gesundheitlichen Versorgungsangeboten bei Geflüchteten in Psychosozialen Zentren*. (2019). Available online at: http://www.baff-zentren.org/wp-content/uploads/2020/10/Arbeitspapier_PSZ_RESPOND.pdf (accessed January 21, 2021).

90. Jannesari S, Hatch S, Prina M, Oram S. Post-migration social-environmental factors associated with mental health problems among asylum seekers: a systematic review. *J Immigr Minor Health*. (2020) 22:1055–64. doi: 10.1007/s10903-020-01025-2
91. BAMF. *Asylgeschäftsstatistik: Aktuelle Zahlen. Ausgabe: Juni 2020. Tabellen Diagramme Erläuterungen*. (2020). Available online at: https://www.interkulturellewoche.de/sites/default/files/inlinefiles/aktuelle-zahlenjuni-2020.pdf%3Bjsessionid%3DE3C2AC45A654325587804CBBEB583815.internet542.pdf (accessed November 15, 2020).
92. Krämer A, Fischer F. Refugee health: public health theory and disease dynamics. In: Krämer A, Fischer F, editors. *Refugee Migration and Health: Challenges for Germany and Europe*. Heidelberg: Springer (2019). p. 3–18. doi: 10.1007/978-3-030-03155-8_1
93. Laban CJ, Gernaat HB, Komproe IH, Schreuders BA, De Jong JT. Impact of a long asylum procedure on the prevalence of psychiatric disorders in Iraqi asylum seekers in The Netherlands. *J Nerv Mental Dis*. (2004) 192:843–51. doi: 10.1097/01.nmd.0000146739.26187.15
94. Laban CJ, Komproe IH, Gernaat HB, de Jong JT. The impact of a long asylum procedure on quality of life, disability and physical health in Iraqi asylum seekers in the Netherlands. *Soc Psychiatry Psychiatr Epidemiol*. (2008) 43:507–15. doi: 10.1007/s00127-008-0333-1
95. Posselt M, McIntyre H, Ngcanga M, Lines T, Procter N. The mental health status of asylum seekers in middle- to high-income countries: a synthesis of current global evidence. *Br Med Bull*. (2020) 134:4–20. doi: 10.1093/bmb/ldaa010
96. Silove D, Steel Z, Susljik I, Frommer N, Loneragan C, Chey T, et al. The impact of the refugee decision on the trajectory of PTSD, anxiety, and depressive symptoms among asylum seekers: a longitudinal study. *Am J Disaster Med*. (2007) 2:321–29. doi: 10.5055/ajdm.2007.0041
97. Steel Z, Silove D, Brooks R, Momartin S, Alzuhairi B, Suslik I. Impact of immigration detention and temporary protection on the mental health of refugees. *Br J Psychiatry*. (2006) 188:58–64. doi: 10.1192/bjp.bp.104.007864
98. Nickerson A, Steel Z, Bryant R, Brooks R, Silove D. Change in visa status amongst Mandaean refugees: Relationship to psychological symptoms and living difficulties. *Psychiatry Res*. (2011) 187:267–74. doi: 10.1016/j.psychres.2010.12.015
99. Raghavan S, Rasmussen A, Rosenfeld B, Keller AS. Correlates of symptom reduction in treatment-seeking survivors of torture. *Psychol Trauma Theory Res Pract Policy*. (2013) 5:377–83. doi: 10.1037/a0028118
100. Richter K, Lehfeld H, Niklewski G. Waiting for asylum: psychiatric diagnosis in bavarian admission center. *Gesundheitswesen*. (2015) 77:834–38. doi: 10.1055/s-0035-1564075
101. Silove D, Ventevogel P, Rees S. The contemporary refugee crisis: an overview of mental health challenges. *World Psychiatry*. (2017) 16:130–39. doi: 10.1002/wps.20438
102. Beiser M, Houa F. Language acquisition, unemployment and depressive disorder among Southeast Asian refugees: a 10-year study. *Soc Sci Med*. (2001) 53:1321–34. doi: 10.1016/S0277-9536(00)00412-3
103. Steel Z, Silove D, Phan T, Bauman A. Long-term effect of psychological trauma on the mental health of Vietnamese refugees resettled in Australia: a population-based study. *Lancet*. (2002) 360:1056–62. doi: 10.1016/S0140-6736(02)11142-1
104. Schweitzer R, Melville F, Steel Z, Lacherez P. Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. *Aust N Z J Psychiatry*. (2006) 40:179–87. doi: 10.1080/j.1440-1614.2006.01766.x
105. Kim I. Beyond trauma: post-resettlement factors and mental health outcomes among Latino and Asian refugees in the United States. *J Immigr Minor Health*. (2016) 18:740–48. doi: 10.1007/s10903-015-0251-8
106. Endicott R. *The Economic Integration of Canada's Refugees: Understanding the Issues with Canada's Approach*. London: The University of Western Ontario (2017).
107. Rousseau C, Mekki-Berrada A, Moreau S. Trauma and extended separation from family among Latin American and African Refugees in montreal. *Psychiatry J*. (2001) 64:40–59. doi: 10.1521/psyc.64.1.40.18238
108. Nickerson A, Bryant RA, Steel Z, Silove D, Brooks R. The impact of fear for family on mental health in a resettled Iraqi refugee community. *J Psychiatr Res*. (2010) 44:229–35. doi: 10.1016/j.jpsychires.2009.08.006
109. Renner A, Hoffmann R, Nagl M, Roehr S, Jung F, Grochtdreis T, et al. Syrian refugees in Germany: perspectives on mental health and coping strategies. *J Psychosom Res*. (2019) 129:109906. doi: 10.1016/j.jpsychores.2019.109906
110. Schick M, Zumwald A, Knopfli B, Nickerson A, Bryant RA, Schnyder U, et al. Challenging future, challenging past: the relationship of social integration and psychological impairment in traumatized refugees. *Eur J Psychotraumatol*. (2016) 7:28057. doi: 10.3402/ejpt.v7.28057
111. Antidiskriminierungsstelle des Bundes. *Diskriminierungsrisiken für Geflüchtete in Deutschland*. (2016). Available online at: https://www.antidiskriminierungsstelle.de/SharedDocs/Downloads/DE/publikationen/Expertisen/Diskriminierungsrisiken_fuer_Gefluechtete_in_Deutschland.pdf?__blob=publicationFile&v=4 (accessed May 4, 2020).
112. Abels I, Kurmeyer C, Merkle I. *Charité für geflüchtete Frauen. Women for Women. Jahresbericht 2016*. Berlin: Charité Berlin (2017).
113. BAMF. *Asylgeschäftsstatistik: Aktuelle Zahlen. Ausgabe: März 2020. Tabellen Diagramme Erläuterungen*. (2020). Available online at: https://www.bamf.de/SharedDocs/Anlagen/DE/Statistik/AsylinZahlen/aktuelle-zahlen-maerz-2020.pdf?__blob=publicationFile&v=4#page=8
114. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: meta-analyses of diagnoses and symptoms. *Psychol Bull J*. (2017) 143:783–822. doi: 10.1037/bul0000102
115. Hollander AC, Bruce D, Burstrom B, Ekblad S. Gender-related mental health differences between refugees and non-refugee immigrants -a cross-sectional register-based study. *BMC Public Health*. (2011) 11:180. doi: 10.1186/1471-2458-11-180
116. OECD. *2019 International Migration and Displacement Trends and Policies Report to the G20*. (2019). Available online at: http://www.oecd.org/migration/mig/G20-migration-and-displacement-trends-and-policies-report-2019.pdf (accessed May 2, 2020).
117. WHO. *Prevention of Mental Disorders: Effective Interventions and Policy Options: Summary Report*. Geneva: World Health Organization (2004).

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.

frontiers
in Psychiatry

BRIEF RESEARCH REPORT
published: 18 March 2021
doi: 10.3389/fpsyt.2021.594340

Health Care Workers' Mental Health During the First Weeks of the SARS-CoV-2 Pandemic in Switzerland—A Cross-Sectional Study

Sonja Weilenmann[1], Jutta Ernst[2], Heidi Petry[2], Monique C. Pfaltz[1], Onur Sazpinar[3], Samuel Gehrke[1], Francesca Paolercio[4], Roland von Känel[1] and Tobias R. Spiller[1]*

[1] Department of Consultation-Liaison Psychiatry and Psychosomatic Medicine, University Hospital Zurich, University of Zurich, Zurich, Switzerland, [2] Center for Clinical Nursing Science, University Hospital Zurich, University of Zurich, Zurich, Switzerland, [3] Department of Internal Medicine, University Hospital Zurich, University of Zurich, Zurich, Switzerland, [4] Department of Psychology, University of Zurich, Zurich, Switzerland

OPEN ACCESS

Edited by:
Malek Bajbouj,
Charité–Universitätsmedizin
Berlin, Germany

Reviewed by:
Simone Grimm,
Medical School Berlin, Germany
Solveig Kemna,
Charité–Universitätsmedizin
Berlin, Germany

***Correspondence:**
Tobias R. Spiller
tobiasr.r.spiller@gmail.com

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *13 August 2020*
Accepted: *15 February 2021*
Published: *18 March 2021*

Citation:
Weilenmann S, Ernst J, Petry H, Pfaltz MC, Sazpinar O, Gehrke S, Paolercio F, von Känel R and Spiller TR (2021) Health Care Workers' Mental Health During the First Weeks of the SARS-CoV-2 Pandemic in Switzerland—A Cross-Sectional Study. Front. Psychiatry 12:594340. doi: 10.3389/fpsyt.2021.594340

Objective: The current SARS-CoV-2 pandemic poses various challenges for health care workers (HCWs). This may affect their mental health, which is crucial to maintain high quality medical care during a pandemic. Existing evidence suggests that HCWs, especially women, nurses, frontline staff, and those exposed to COVID-19 patients, are at risk for anxiety and depression. However, a comprehensive overview of risk and protective factors considering their mutual influence is lacking. Therefore, this study aimed at exploring HCWs' mental health during the SARS-CoV-2 pandemic in Switzerland, investigating the independent effect of various demographic, work- and COVID-related factors on HCWs' mental health.

Methods: In an exploratory, cross-sectional, nation-wide online survey, we assessed demographics, work characteristics, COVID-19 exposure, and anxiety, depression, and burnout in 1,406 HCWs during the beginning of the SARS-CoV-2 pandemic in Switzerland. Network analysis was used to investigate the associations among the included variables.

Results: Women (compared to men), nurses (compared to physicians), frontline staff (compared to non-frontline workers), and HCWs exposed to COVID-19 patients (compared to non-exposed) reported more symptoms than their peers. However, these effects were all small. Perceived support by the employer independently predicted anxiety and burnout after adjustment for other risk factors.

Conclusion: Our finding that some HCWs had elevated levels of anxiety, depression, and burnout underscores the importance to systematically monitor HCWs' mental health during this ongoing pandemic. Because perceived support and mental health impairments were negatively related, we encourage the implementation of supportive measures for HCWs' well-being during this crisis.

Keywords: COVID-19, mental health, health care worker, burnout, pandemic, Switzerland

INTRODUCTION

Since December 2019, the world has witnessed a pandemic spread of SARS-CoV-2 with increasing numbers of patients suffering from COVID-19 (1, 2). This global public health crisis poses various challenges for health care workers (HCW) all around the world. During the first weeks of the pandemic, some HCWs worked additional hours to care for the high number of COVID-19 patients and put themselves at risk for infection, while others have seen their workload diminish due to public health-related measures enforced by authorities (3).

From research in HCWs, it is well-known that work-related stressors such as working overtime are associated with impaired mental health, for example, in the form of burnout, anxiety, and depression (4–7). Importantly, the consequences of reduced mental health not only affect HCWs themselves, but also their professional functioning including the quality of care they provide (5, 8–10). This is highly problematic, given that medical performance is essential to manage the consequences of this public health crisis.

The authors of a recent meta-analysis reported higher levels of psychological distress in HCWs working with infected patients during emerging virus outbreaks (11). Moreover, they identified several risk factors for psychological distress in HCWs, including working as a nurse and lack of organizational support. On the other hand, access to personal protective equipment and adequate time off work were found to act protectively (11). Regarding the current SARS-CoV-2 pandemic, an increasing number of studies reported on HCWs' mental health [e.g., (12, 13)]. A meta-analysis of this literature conducted in April 2020 reported a pooled prevalence of 23.2% for anxiety and 22.8% for depression (14). In accordance with Kisely and colleagues (11), subgroup analyses revealed a higher prevalence of symptoms of anxiety and depression among females and nurses.

However, one general limitation was that the majority of these studies were conducted in a single country, namely China (14). Furthermore, the commonly conducted, unadjusted subgroup comparisons (e.g., the prevalence of distress among nursing staff compared to physician) were prone to bias due to a high intercorrelation among the included risk factors ("working as a nurse" is likely confounded by the gender imbalance among nurses). Additionally, a comprehensive investigation of the interactions between risk and protective factors and their adjusted effect on mental health among HCWs during an emerging virus outbreak is lacking.

In this cross-sectional, nation-wide study, we assessed the mental health of physicians and nurses during the SARS-CoV-2 pandemic in Switzerland. In addition, we collected data on known risk and protective factors, including demographics (e.g., gender, profession, professional experience), work characteristics (e.g., availability of support, work hours), and COVID-19 exposure at work (e.g., exposure to COVID-19 patients, working as frontline staff). The data was collected between March 28 and April 4, 2020. At that time, Switzerland had among the highest per capita rate of COVID-19 cases in the world.

This exploratory study had three aims. First, we assessed HCWs' mental health by their levels of anxiety, depression, and burnout. Second, we aimed to compare the levels of symptoms between commonly investigated subgroups (e.g., frontline and non-frontline workers) in a pairwise manner to ensure comparability of our results with the previous literature. Third, we conducted a network analysis to provide a comprehensive overview of the adjusted effects of the various factors outlined above on HCWs' mental health.

METHOD

Procedure

This study had an explorative, cross-sectional design with a single period of data collection and was carried out as a fully anonymous online survey in German, French, and Italian. The survey was accessible through a link and could be filled out using a computer, tablet, or smartphone. Data from participants was saved and accessible for analysis only after full completion of the survey. However, some items (e.g., years of professional experience) were assessed using a text-field, which led to minor data loss due to wrong input from participants. For the group differences analyses, missing data was handled by pairwise deletion. For the network analysis, all participants with missing data were removed.

The ethics committee of the canton Zurich assessed the study and officially declared that the study did not fall within the scope of the Human Research Act (BASEC-Nr. Req-2020-00471). Therefore, no authorization from the ethics committee was required. Still, all participants were asked for their informed consent at the beginning of the survey. Data was collected between March 28 and April 4, 2020, starting 2 weeks after the federal council (constituting the collective head of state) categorized the situation as "extraordinary" (March 16, 2020) (15) and singed an executive order resulting in a partial "lockdown" (15).

Participants

Inclusion criteria were (a) actively working as a nurse or physician in Switzerland and (b) being at least 18 years old. Participants older than 69 years old, the age of the latest official retirement in Switzerland, were excluded from the current analysis. We implement the recruitment as a non-targeted, snowball approach using mailing lists of hospitals and professional societies, social media, and personal contacts of the study team members, with a focus on reaching health care workers in all parts of Switzerland.

Sample

We received a total of 1,533 completed questionnaires. Of these, 124 (8.1%) participants did not meet the inclusion criteria. Of the remaining 1,409 participants, 3 (0.2%) indicated their gender as "other" and were excluded from further analysis to ensure comparability of groups. This resulted in a final sample size of

---

Abbreviations: HCW, health care workers; SARS-CoV-2, Severe Acute Respiratory Syndrome Coronavirus 2; COVID-19, Coronavirus Disease 2019; GAD-7, General Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9; MBI, Maslach Burnout Inventory, IQR, Interquartile range.

1,406, of which 857 (61.0%) were physicians and 549 (39.0%) were nurses.

Measurements

Demographics

Demographics included age (in years), gender (woman, man, and other), profession (physician, nurse, and other), professional experience (in years), and canton (corresponding to a federal state) in which participants worked.

Work Characteristics

Participants reported their average weekly work hours prior to the pandemic, their total work hours during the past seven days, and their average hours of sleep per night during the past 7 days. Furthermore, using several single item questions with a Likert scale from 1 = "not at all" to 7 = "absolutely," participants rated the extent to which they generally felt well-equipped (e.g., with protective masks), well-supported by the authorities and employers, and well-informed (e.g., about the development of the pandemic) by the authorities and employers.

COVID-19 Exposure and Frontline/Non-frontline

Exposure to COVID-19 was assessed by several nominal questions (yes/no). First, participants indicated if they had experienced COVID-19 symptoms (e.g., fever, cough) since the beginning of the pandemic or if they had been tested positively for SARS-CoV-2. Second, they reported whether they had been exposed to suspected or confirmed COVID-19 patients during work, and third, whether they had been working in a clinical unit designated to the diagnosis and treatment of COVID-19 patients. Participants answering to the latter question affirmatively were considered as frontline workers, the others as non-frontline workers.

Mental Health

The *General Anxiety Disorder-7* [GAD-7 (16)], a 7-item questionnaire, was used to measure symptoms of anxiety. Symptoms of depression were measured with the 9-item *Patient Health Questionnaire-9* [PHQ-9 (17)]. Both questionnaires are validated and frequently used instruments to assess the self-reported symptom severity of generalized anxiety and depression (18, 19). In both questionnaires, individual symptoms are assessed by ratings on a 4-point Likert scale ranging from 0 = "not at all" to 3 = "nearly every day." An overall score can be calculated by summing individual items. Consequently, the sum scores of the GAD-7 and PHQ-9 range from 0 to 21 and 0 to 27, respectively. Sum scores of 10 points or higher indicate clinically relevant symptoms, corresponding to a diagnosis of generalized anxiety disorder or a depressive episode (16–18). Burnout was assessed using a brief measurement tool for physician burnout developed and validated by West et al. (20). This tool consists of two single items derived from the *Maslach Burnout Inventory* [MBI (21, 22)] measuring emotional exhaustion and depersonalization, two cardinal dimensions of burnout. These items were rated on a 7-point Likert scale ranging from 0 = "never" to 6 = "daily" and summed to form a total score. The answer format of all questionnaires was adapted to measure symptoms within the past 7 days. The German, French, and Italian translations of the questionnaires provided by the corresponding manuals were used.

Statistical Analyses

Due to abnormally distributed data, continuous and ordinal items were described using the median and interquartile range [IQR; 25–75%] Categorical data were described with frequency (%). Accordingly, we used two-tailed Mann-Whitney-U-tests and chi-square-tests to assess differences between independent groups. The effect size of group differences of ordinal and continuous variables was assessed as rank biserial correlation. The significance level for all tests was set to alpha = 0.05. Given the explorative study design, p-values were not adjusted for multiple comparisons. Descriptive statistics and comparison of independent groups were conducted using JASP version 0.11 (23).

We performed a network analysis to assess the relationship of the variables used in the independent group comparisons (gender, profession, COVID-exposure, (non-)frontline workplace) with symptoms of anxiety, depression, and burnout controlling for their mutual effects and for the influence of additional known risk factors [work hours, professional experience, perceived support (5, 24)]. Due to the high intercorrelation among the items assessing perceived support, we only entered "perceived support from the employer" into the network analysis. This item was chosen because it can be considered an umbrella term that subsumes instrumental support (i.e., feeling well-equipped) and informational support (i.e., feeling well-informed) (25).

In the resulting network, variables are represented by nodes, and the edges between these variables represent relationships between the variables (in the case of continuous variables the edge is equal to the partial correlation between them) adjusted for the effect of all other variables included in the network. Prior to the network estimation, symptom overlap was tested using the default settings of the goldbricker function of the *networktools* package (26). No exclusion of symptoms was suggested. The network was estimated using a regularization technique based on the least absolute shrinkage and selection operator [LASSO (27, 28)], which sets very small edges to zero and thus reduces the false positive rate [for more details see Epskamp et al. (29)]. Stability and reliability analyses were conducted as recommended using the *bootnet* package (29). Network analysis was performed in the R statistical environment using the *mgm* (30) *qgraph* (31) and *bootnet* package (28).

RESULTS

Overall Sample

Table 1 summarizes demographics, work characteristics, and COVID-19 exposure of the whole sample. Symptom severity scores are presented in **Table 2**. Of the finally included 1,406 participants, the majority were German-speaking (n = 1,120, 79.7%), women (n = 930, 66.1%), had a median age of 34 years [29–46] and a median professional experience of 10 years [4–20]. Median working hours in the sample was 45

TABLE 1 | Demographics, work characteristics, and COVID-19 exposure of 1,406 health care workers.

	Overall (N = 1,406)	
Variable	**Median**	***IQR***
Demographics		
Age in years[a]	34	29–46
Women, n (%)	930	66.1
Professional experience in years[a]	10	4–20
Nurses, n (%)	549	39.0
Physicians, n (%)	857	61.0
German speaking, n (%)	1,120	79.7
French speaking, n (%)	143	10.1
Italian speaking, n (%)	143	10.1
Work characteristics		
Total working hours in the previous 7 days	45	36–54
Total working hours per week prior to the pandemic[b]	45	40–50
Working more during the pandemic than before, n (%)[b]	572	40.7
Working less during the pandemic than before, n (%)[b]	414	29.4
Average number of sleep hours in the previous 7 days[c]	7	6–7.5
Having access to medical equipment	5	3–6
Perceived support by employer[d]	6	4–7
Perceived support by authorities	5	3–6
Perceived passage of information by employer[e]	6	4–7
Perceived passage of information by authorities	5	4–6
COVID-19 Exposure		
Had suspected COVID-19 symptoms or tested positive for SARS-CoV-2, n (%)	196	13.9
Was exposed to suspected or confirmed COVID-19 patients at work, n (%)	1,101	78.3
Worked in at clinical unit designated to diagnosis and treatment of patients with suspected or confirmed COVID-19, n (%)	654	46.5

[a]N = 1,382; [b]N = 1,349; [c]N = 1,332 [d]N = 1,278; [e]N = 1,286.

[36–54], with 572 (40.7%) participants working more hours than before the pandemic. Overall, experienced availability of medical equipment, support, and information by the employer and the authorities was high (all median scores ranging between 5 and 6, with 7 indicating the upper bound of the scale). One hundred ninety-six (13.9%) of the participants had suspected COVID-19 symptoms or were tested positive for SARS-CoV-2, 1,101 (78.3%) had contact with COVID-19 patients at work and 654 (46.5%) worked in designated COVID-19 units. Median anxiety and depressive symptom scores were 6 [3–10] and 5 [2–9]. Hence, these median scores were in the mild range [5–9 points (16, 17)]. Based on the suggested cut-offs (a total score of $\geq$10), 364 participants (25.9%) had clinically relevant symptoms of anxiety and 290 (20.6%) had clinically relevant symptoms of depression (see **Supplementary Table 1**). For the 2-item burnout scale, scores ranged from 0 to 12, and the sample median was 4 [2–6].

Group Differences

Results from group comparisons of symptom severity are presented in **Table 2**. In summary, women had higher symptom levels of anxiety and depression than men, yet similar burnout symptoms. Nursing staff showed more symptoms of anxiety, depression, and burnout than physicians. HCWs exposed to COVID-19 patients had more symptoms than non-exposed HCWs, and frontline staff showed more symptoms than non-frontline staff. However, all group differences showed small effects (ranging from −0.077 to −0.250). Similar to these results, a significantly higher share of women (than man), nurses (than physicians), frontline staff (than non-frontline staff), and HCWs exposed to COVID-19 patients (than the non-exposed to COVID-19 patients) had clinically relevant symptoms of anxiety and depression (see **Supplementary Table 1**).

Relationships Among the Investigated Variables (Network Analysis)

The results of the network analysis are visualized in **Figure 1**. The edges in the network represent statistical relationships between the variables, with the thickness of the edge representing the magnitude of the association and the color indicating the direction (red = negative, blue = positive). As expected, being a woman was associated with working as a nurse, and working in a designated COVID-19 unit was associated with exposure to COVID-19 patients at work. Moreover, the total symptom scores of anxiety, depression, and burnout were associated with one another. Symptoms of depression

TABLE 2 | Mental health of 1,406 health care workers and comparison across different subgroups.

		Gender			Profession			Workplace			Exposure to COVID-19 patients		
	Overall (*N* = 1,410)	**Women (*n* = 934)**	**Men (n= 476)**	**Effect size**	**Nurses (*n* = 553)**	**Physicians (*n* = 857)**	**Effect size**	**Frontline (*n* = 655)**	**Secondline (*n* = 755)**	**Effect size**	**Yes (*n* = 1,103)**	**No (*n* = 307)**	**Effect size**
Anxiety	6 (3-10)	6 (4–10.75)	4 (3-8)***	−0.197	7 (4-10)	5 (3-9)***	−0.144	6 (3-11)	5 (3-9)**	−0.095	6 (3-10)	5 (3-8)***	−0.155
Depression	5 (2–8.75)	6 (3-9)	4 (2-7)***	−0.165	6 (3-9)	5 (2-8)***	−0.140	6 (3-10)	4 (2-8)***	−0.146	6 (3-9)	4 (1-7)***	−0.220
Burnout	4 (2-6)	4 (2-6)	4 (2-6)		4 (2-7)	4 (2-6)*	−0.077	5 (2-7)	3 (2-6)***	−0.198	4 (2-7)	3 (1-5)***	−0.250

ES, Effect Size; Effect size is measured as a rank-biserial-correlation; Burnout, Overall burnout symptom score; Anxiety, Overall GAD-7 score; Depression, Overall PHQ-9 score. $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$.

were not associated with any factor other than burnout and anxiety. Regarding anxiety, associations with gender, professional experience, and perceived support by the employer emerged. Burnout was associated with professional experience, work hours, exposure to COVID-19 patients, and perceived support from the employer. Additional results (e.g., stability analyses of the network) are presented in the Supplemental Digital Content.

DISCUSSION

In summary, participants reported mild levels of anxiety and depression, and elevated burnout scores. Approximately 40% of our sample worked more during the pandemic than before. Almost half of the sample was assigned to a designated COVID-19 unit and close to 80% were exposed to suspected or confirmed COVID-19 patients at work. Importantly, health care workers felt mostly well-equipped, supported, and informed by the employers and authorities.

At first glance, the prevalence of clinically significant anxiety and depression in our sample (25.9 and 20.6%) was comparable to the reported prevalence of anxiety (23.2%) and depression (22.8%) in the meta-analysis by Pappa et al. (14); (also see **Supplementary Table 1**). However, the inspection of the studies using the same questionnaires as we did, revealed a substantially higher the prevalence of anxiety (44.5%) in the study by Lai and colleagues (12). However, they defined relevant symptoms of anxiety as an overall score on the GAD-7 of seven or higher, whereas, we used the cut-off suggested by the developers of the GAD-7, namely ten (16). Applying the same cut-off of ten points to Lai et al.'s (12) study results in a prevalence of clinically relevant anxiety of 12.2% (154 of 1,257 participants), This is sustainably lower than in our sample. The higher prevalence of anxiety and depression among Swiss HCWs could have several reasons. First, at the time of data collection, Switzerland had a very high per capita rate of COVID-19 cases, higher than during the study period of the other two studies. Second, in non-pandemic times, several studies have consistently documented higher levels of anxiety and depression in European countries compared to Asian nations (32). Thus, the higher prevalence in our sample might be due to higher general levels of anxiety and depression or to culture-dependent social desirability effects. Third, in contrast to China, Switzerland was not affected by the SARS pandemic at the beginning of the century. Thus, Chinese HCWs probably had more experience dealing with a pandemic than Swiss HCWs, which could have reduced their symptom burden (33). These hypotheses are underscored by a study conducted among Italian HCWs during a time-period in which Italy had an even higher COVID-19 case-load per capita than Switzerland (34). The authors reported a median overall score of 9 [4–13] for the GAD-7 and of 10 [5–14] for the PHQ-9 among their participants, which was both above the corresponding medians in this study. Still, the generalizability of our findings to other (non-) European countries remains limited due to the different characteristics of the healthcare systems,

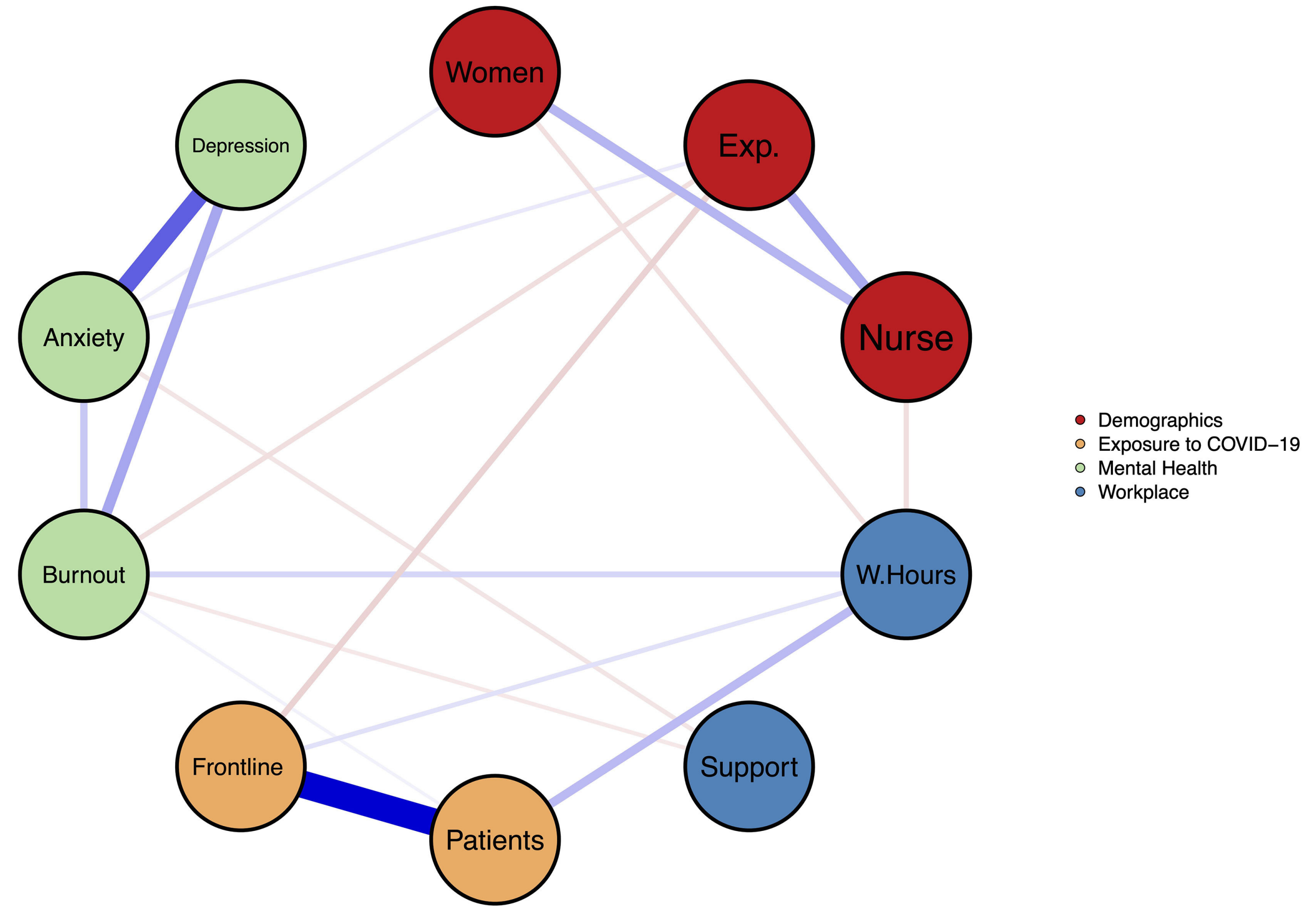


FIGURE 1 | Relationships between demographics, work characteristics, COVID-19 exposure, and symptoms of anxiety, depression, and burnout. Nodes represent variables; Edges represent statistical associations between variables (blue = positive, red = negative, thickness = magnitude of the correlation); The coloring of the nodes indicates their class membership (Red = Demographic data, Blue = Workplace characteristics, Orange = Exposure to COVID-19, Green = Mental Health); Women = Gender (Levels: Men = 1, Women = 2); Exp. = Professional experience in years; Nurse = Nursing Staff (Variable = Profession. Levels: Physician = 1, Nurse = 2); W.Hours = Total working hours in the previous 7 days; Support = Perceived support by employer; Patients = Exposure to suspected or confirmed COVID-19 patients at work (Levels: No = 0, Yes = 1); Ward = Working in clinical unit designated to diagnosis and treatment of patients with suspected or confirmed COVID-19 (Levels: No = 0, Yes = 1); Burnout = Overall burnout symptom score; Anxiety = Overall GAD-7 score; Depression = Overall PHQ-9 score.

governmental response to the pandemic and the course of the pandemic itself, which vary across different countries.

The group comparisons revealed that women (compared to men), nurses (compared to physicians), frontline staff (compared to non-frontline staff), and health care workers exposed to COVID-19 patients (compared to non-exposed), exhibited higher levels of symptoms and a higher prevalence of clinically relevant symptoms of anxiety and depression. However, all effects were small. The found differences between women and men, and nurses and physicians are in line with the subgroup analyses of the meta-analysis by Pappa et al. (14). However, as noted above, unadjusted comparisons across several groups must be interpreted with caution, because some variables (e.g., women and nurse or frontline workers and exposure to COVID-19 patients) are highly intercorrelated and thus confound results.

By conducting the first network analysis on mental health and associated factors during the pandemic, we were able to map the relationships between several variables while controlling for the mutual influence of all other variables included in the network. Here, we highlight four clusters of associations. First, being a frontline worker and exposure to COVID-19 patients was not associated with anxiety and depression when controlling for the effects of the other variables in the network. This relativizes the (unadjusted) effects found in the subgroup analyses, in which both, being a frontline worker and exposure to COVID-19 patients, was associated with more anxiety and depression. However, the relationship between exposure to COVID-19 patients and burnout was still significant. Second, support by the employer was a significant predictor of both burnout and anxiety. The role of perceived support has been studied extensively in occupational and health psychology (25), and its direct relationship with the mental health of HCWs is well-documented (5, 6, 35). For example, as postulated by the job-demand-control-support model (36), which has a broad empirical foundation (37), support is not only important to well-being but reduces the mental strain caused by job demands such as in this case, COVID-19 exposure. Moreover, the importance of support was also recently emphasized in a qualitative study on HCWs' concerns regarding the SARS-CoV-2 pandemic (38). Third, anxiety was associated with depression, burnout, female gender, longer professional experience, and perceived support from the employer. While higher levels of anxiety among women in general (39) and in female HCWs during a pandemic in particular (12, 40) are well-documented, the positive association with professional experience is counterintuitive. Given that HCWs with higher professional experience tended to be older, we can only speculate that these HCWs more likely belonged to a risk group for COVID-19 related complications (e.g., cardiac diseases). This might have led to more anxiety. Fourth, burnout was negatively associated with professional experience and positively related to work hours, which is well-documented in the literature on HCW burnout (5, 24).

This study is limited in several ways. First, the cross-sectional nature of the study with a single period of data collection and no control group does not allow to draw conclusions about the baseline prevalence of the investigated symptoms nor about their change. In other words, neither do we know whether symptoms changed compared to before the pandemic, nor whether HCWs reacted in a specific way differently from the general population. These important questions need to be addressed in future studies with an appropriate design (e.g., within the frame of ongoing cohort studies also including non-HCWs as a control group). Nevertheless, the symptom level of anxiety, depression and burnout in our population was comparable to the prevalence among HCWs in Switzerland in studies conducted during non-pandemic times (41–43). However, these studies used different instruments to assess symptom levels than the present study. Thus, symptom levels are not directly comparable. Second, given the non-targeted recruitment, our sample was likely not representative of HCWs in Switzerland. Moreover, the non-targeted recruitment might have introduced a selection bias in several ways (e.g., very busy HCWs or those with a higher symptom burden might not have been willing to participate). In addition, due to the non-targeted recruitment, we were unable to calculate a response rate. Still, the 857 physicians participating in this study represent ∼2.3% of all 37,882 licensed Swiss physicians in 2019 (44). Third, the mental health of participants was measured using self-report questionnaires. This might lead to an overestimation of symptoms (17). In addition, several variables (e.g., perceived support) were assessed using non-validated, single item questions. Future research should aim to incorporate validated tools whenever possible. Fourth, the adaptation of all questionnaires to cover symptom experience over the last 7 days has not been validated and limits comparability to studies undertaken with the original validated versions of the questionnaires [covering 2 weeks in case of the GAD-7 (16) and PHQ-9 (17) and a full year in case of the brief measurement tool for physician burnout developed and validated by West et al. (20)]. However, the strength of the restriction to the past 7 days lies in the capacity to measure symptoms during a highly dynamic time of crisis. Finally, questions regarding COVID-exposure or perceived support were developed for this specific study and were therefore not validated.

Notwithstanding these limitations, our study has clinical and scientific implications. The relatively high percentage of HCWs with clinically relevant symptoms of anxiety (25.9%) and depression (20.6%) underscores the importance to systematically monitor HCWs' mental health during this ongoing pandemic. Furthermore, supportive measures should be implemented. Such measures should address the key concerns of HCWs identified in previous research [e.g., sufficient access to personal protective equipment and access to child-care during increased work hours (38)] or stress-induced symptoms [e.g., stress reduction coaching based on skills from different psychotherapy modalities (45)]. Most importantly, however, HCWs themselves can best express their individual needs. Hence, we encourage managers and regulators to actively engage with the health care force and actively address their concerns. Due to the well-documented negative effect of impaired mental health on HCWs on their provided care (5, 8–10), these measures not only support HCWs themselves but also serve patients by ensuring the continuation of high-quality care, especially during a public health crisis.

Regarding future research, the most important question is how the mental health of HCWs will develop over the course of the pandemic. This should be addressed by longitudinal studies, ideally using a cohort design with several assessment time points during and after the SARS-CoV-2 pandemic. In addition, existing cohort studies with HCWs could conduct an additional assessment during the pandemic and would then be able to assess whether HCWs developed more symptoms during the pandemic compared to before. Moreover, it has to be noted that mental health problems during a pandemic may not be the direct result of the pandemic itself, but rather due to the containment efforts (e.g., social isolation) or the economic consequences (e.g., job loss) (46). To what extent HCWs are less affected by these consequences (e.g., due to their job security) compared with the general population during this pandemic also warrants further investigation.

In conclusion, in our sample overall symptom levels of anxiety and depression were mild, and burnout was elevated. Still, symptoms of anxiety and depression were significantly higher than in a similar study conducted in China (12) but lower than in an Italian study (34), both conducted during the beginning of the SARS-CoV-2 pandemic. In general, participants felt well-equipped and well-supported by their employer and the authorities. Women reported more symptoms than men, nurses more than physicians, frontline staff more than those not working on the frontline, and HCWs exposed to COVID-19 more than non-exposed peers. However, these effects were all small and most of them did not remain significant after controlling for other factors within the network analysis. Importantly, whereas, COVID-19 exposure was only partially associated with burnout, perceived support by the employer independently predicted anxiety and burnout. Given that the SARS-CoV-2 pandemic is ongoing and its future progress unpredictable, we encourage the implementation of monitoring systems for HCWs' mental health and measures to maintain their well-being during this 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

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

SW and TS were responsible for initiating this study and assembling the research team and drafted the manuscript. MP, HP, and RK supervised the research project. SW, JE, RK, and TS were equally responsible for conceptualizing the study. SW, JE, OS, SG, and FP provided administrative and technical support. All authors were involved in data acquisition, its analysis and its interpretation. All authors revised the manuscript, assisted in the final conceptualization of the manuscript, and assisted in finalizing it for submission. All authors read and approved the final version of the manuscript and the **Supplementary Material**.

FUNDING

This work was supported by Forschungskredit of the University of Zurich, Grant No. FK-19-048 (TS). The funding agency had no role in the study design; in the collection, analysis and interpretation of data; in the writing of the manuscript; or in the decision to submit the article for publication.

ACKNOWLEDGMENTS

This manuscript has been released as a pre-print at medRxiv, (47). We would like to express our gratitude to all professional societies and hospitals who supported us and kindly distributed our survey among health care workers. Our special thanks go to Sophie-Charlotte Fischer.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.594340/full#supplementary-material

REFERENCES

1. World Health Organization. *Rolling Updates on Coronavirus Disease (COVID-19)*. (2020). Available online at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen (accessed February 01, 2021).
2. World Health Organization. *Coronavirus Disease (COVID-2019) Situation Reports*. (2020). Available online at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/ (accessed February 01, 2021).
3. von Matt R. *Paradoxe Situation. Kurzarbeit in Spitälern in der Corona-Krise*. (2020). Available online at: https://www.srf.ch/news/schweiz/paradoxe-situation-kurzarbeit-in-spitaelern-in-der-corona-krise (accessed February 01, 2021).
4. Shanafelt TD, Sloan JA, Habermann TM. The well-being of physicians. *Am J Med*. (2003) 114:513–9. doi: 10.1016/S0002-9343(03)00117-7
5. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being. *Mayo Clin Proc*. (2017) 92:129–46. doi: 10.1016/j.mayocp.2016.10.004
6. Wallace JE, Lemaire JB, Ghali WA. Physician wellness: a missing quality indicator. *The Lancet*. (2009) 374:1714–21. doi: 10.1016/S0140-6736(09)61424-0
7. Jennings BM. Work stress and burnout among nurses: role of the work environment and working conditions. In: Hughes RG, editor. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses Advances in Patient Safety*. Rockville, MD: Agency for Healthcare Research and Quality. Available online at: http://www.ncbi.nlm.nih.gov/books/NBK2668/ (accessed April 26, 2020)
8. Poghosyan L, Clarke SP, Finlayson M, Aiken LH. Nurse burnout and quality of care: Cross-national investigation in six countries. *Res Nurs Health*. (2010) 33:288–98. doi: 10.1002/nur.20383
9. Scheepers RA, Boerebach BCM, Arah OA, Heineman MJ, Lombarts KM. A Systematic review of the impact of physicians' occupational well-being on the quality of patient care. *Int J Behav Med*. (2015) 22:683–98. doi: 10.1007/s12529-015-9473-3
10. Firth-Cozens J. Interventions to improve physicians' well-being and patient care. *Soc Sci Med*. (2001) 52:215–22. doi: 10.1016/S0277-9536(00)00221-5
11. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. *BMJ*. (2020) 369:m1642. doi: 10.1136/bmj.m1642
12. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. (2020) 3:e203976. doi: 10.1001/jamanetworkopen.2020.3976
13. Tan BYQ, Chew NWS, Lee GKH, Jing M, Goh Y, Yeo LLL, et al. Psychological impact of the COVID-19 pandemic on health care workers in Singapore. *Ann Intern Med*. (2020) 173:317–20. doi: 10.7326/M20-1083
14. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun*. (2020) 88:901–07. doi: 10.2139/ssrn.3594632
15. Bundesamt für Gesundheit. *Coronavirus: Bundesrat erklärt die ≪ausserordentliche Lage≫ und verschärft die Massnahmen*. (2020). Available online at: https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78454.html (accessed February 01, 2021).
16. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. (2006) 166:1092. doi: 10.1001/archinte.166.10.1092
17. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. (2001) 16:606–13. doi: 10.1046/j.1525-1497.2001.016009606.x
18. Manea L, Gilbody S, McMillan D. Optimal cut-off score for diagnosing depression with the Patient Health Questionnaire (PHQ-9): a meta-analysis. *Can Med Assoc J*. (2012) 184:E191–6. doi: 10.1503/cmaj.110829
19. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, Falloon K, et al. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. *Ann Fam Med*. (2010) 8:348–53. doi: 10.1370/afm.1139

20. West CP, Dyrbye LN, Sloan JA, Shanafelt TD. single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals. *J Gen Intern Med*. (2009) 24:1318–21. doi: 10.1007/s11606-009-1129-z
21. Maslach C, Jackson SE. The measurement of experienced burnout. *J Organ Behav*. (1981) 2:99–113. doi: 10.1002/job.4030020205
22. Maslach C, Jackson SE, Leiter MP. *Maslach Burnout Inventory Manual*. 4th ed. Menlo Park, CA: Mind Garden (2018).
23. JASP Team. *JASP [Computer software]*. (2020). Available online at: https://jasp-stats.org/ (accessed February 01, 2021).
24. Stimpfel AW, Sloane DM, Aiken LH. The longer the shifts for hospital nurses, the higher the levels of burnout and patient dissatisfaction. *Health Aff (Millwood)*. (2012) 31:2501–9. doi: 10.1377/hlthaff.2011.1377
25. Taylor SE. Social support: a review. In: Friedman HS, editor. *The Oxford Handbook of Health Psychology*. Oxford: Oxford University Press.
26. Jones P. *Networktools: Tools for Identifying Important Nodes in Networks*. (2019). Available online at: https://CRAN.R-project.org/package=networktools (accessed January 30, 2020)
27. Epskamp S, Waldorp LJ, Mõttus R, Borsboom D. The gaussian graphical model in cross-sectional and time-series data. *Multivar Behav Res*. (2018) 53:453–80. doi: 10.1080/00273171.2018.1454823
28. Epskamp S, Fried EI. A tutorial on regularized partial correlation networks. *Psychol Methods*. (2018) 23:617–34. doi: 10.1037/met0000167
29. Epskamp S, Borsboom D, Fried EI. Estimating psychological networks and their accuracy: a tutorial paper. *Behav Res Methods*. (2018) 50:195–212. doi: 10.3758/s13428-017-0862-1
30. Haslbeck JMB, Waldorp LJ. *mgm: Estimating Time-Varying Mixed Graphical Models in High-Dimensional Data. ArXiv151006871 Stat*. (2020). Available online at: http://arxiv.org/abs/1510.06871 (accessed April 26, 2020). doi: 10.18637/jss.v093.i08
31. Epskamp S, Cramer AOJ, Waldorp LJ, Schmittmann VD, Borsboom D. qgraph: network visualizations of relationships in psychometric data. *J Stat Softw*. (2012) 48:1–18. doi: 10.18637/jss.v048.i04
32. WHO World Mental Health Survey Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the world health organization world mental health surveys. *JAMA*. (2004) 291:2581. doi: 10.1001/jama.291.21.2581
33. Tan CC. SARS in Singapore-key lessons from an epidemic. *Ann Acad Med Singap*. (2006) 35:345.
34. Rossi R, Socci V, Pacitti F, Di Lorenzo G, Di Marco A, Siracusano A, et al. Mental health outcomes among frontline and second-line health care workers during the coronavirus disease 2019 (COVID-19) pandemic in Italy. *JAMA Netw Open*. (2020) 3:e2010185. doi: 10.1001/jamanetworkopen.2020.10185
35. Velando-Soriano A, Ortega-Campos E, Gómez-Urquiza JL, Ramírez-Baena L, De La Fuente EI, Cañadas-De La Fuente GA. Impact of social support in preventing burnout syndrome in nurses: a systematic review. *Jpn J Nurs Sci*. (2020) 17:e12269. doi: 10.1111/jjns.12269
36. Johnson JV, Hall EM. Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. *Am J Public Health*. (1988) 78:1336–42. doi: 10.2105/AJPH.78.10.1336
37. Häusser JA, Mojzisch A, Niesel M, Schulz-Hardt S. Ten years on: A review of recent research on the Job Demand–Control (-Support) model and psychological well-being. *Work Stress*. (2010) 24:1–35. doi: 10.1080/02678371003683747
38. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA*. (2020) 323:2133–4 doi: 10.1001/jama.2020.5893
39. McLean CP, Asnaani A, Litz BT, Hofmann SG. Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *J Psychiatr Res*. (2011) 45:1027–35. doi: 10.1016/j.jpsychires.2011.03.006
40. Zhang W, Wang K, Yin L, Zhao W, Xue Q, Peng M, et al. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother Psychosom*. (2020) 89:242–50. doi: 10.1159/000507639
41. Arigoni F, Bovier P, Sappino A. Trend of burnout among Swiss doctors. *Swiss Med Wkly*. (2010) 140:w13070. doi: 10.4414/smw.2010.13070
42. Hämmig O. *Gesundheit von Beschäftigten in Gesundheits-berufen*. Zürich: Institut für Epidemiologie, Biostatistik und Prävention der Universität Zürich (2018).
43. Buddeberg-Fischer B, Stamm M, Buddeberg C, Klaghofer R. Angst und Depression bei jungen Ärztinnen und Ärzten - Ergebnisse einer Schweizer Longitudinalstudie. *Z Für Psychosom Med Psychother*. (2009) 55:37–50. doi: 10.13109/zptm.2009.55.1.37
44. Hostettler S, Kraft E. FMH-Ärztestatistik 2019 – hohe Abhängigkeit vom Ausland. *Schweiz Ärzteztg*. (2020) 101:450–5. doi: 10.4414/saez.2020.18725
45. Rosen B, Preisman M, Hunter J, Maunder R. applying psychotherapeutic principles to bolster resilience among health care workers during the COVID-19 pandemic. *Am J Psychother*. (2020) 73:144–8. doi: 10.1176/appi.psychotherapy.20200020
46. Brown S, Schuman DL. Suicide in the time of COVID-19: a perfect storm. *J Rural Health*. (2021) 37:211–4. doi: 10.1111/jrh.12458
47. Weilenmann S, Ernst J, Petry H, Sazpinar O, Pfaltz MC, Gehrke S, et al. Health care workers mental health during the first weeks of the SARS-CoV-2 pandemic in Switzerland: a cross-sectional study. *medRxiv*. (2020).

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.

frontiers
in Psychiatry

BRIEF RESEARCH REPORT
published: 20 May 2021
doi: 10.3389/fpsyt.2021.622830

Immediate Psychological Responses, Stress Factors, and Coping Behaviors in Military Health-Care Professionals During the COVID-19 Pandemic in Tunisia

Hela Slama[1,2,3], Hamdi El Kefi[1,4], Karima Taamallah[2,4,5], Nejla Stambouli[2], Anis Baffoun[2,6], Walid Samoud[2,6], Chaker Bechikh[1,4], Abdelaziz Oumaya[1,4], Khaled Lamine[4,7], Mohamed Jalel Hmida[2,4,6], Hichem Slama[8], Mustapha Ferjani[4,6] and Hedi Gharsallah[2,4,6]*

[1] Psychiatric Department, Military Hospital of Tunis, Tunis, Tunisia, [2] Research Unit UR17DN05 Medical Support to the Armed Forces in Operations and Disaster Situations, Military Hospital of Tunis, Tunis, Tunisia, [3] Faculté de Médecine de Monastir, Université de Monastir, Tunis, Tunisia, [4] Faculté de Médecine de Tunis, Université de Tunis El Manar, Tunis, Tunisia, [5] Cardiology Department, Military Hospital of Tunis, Tunis, Tunisia, [6] Department of Anaesthesiology and Intensive Care, Military Hospital of Tunis, Tunis, Tunisia, [7] Emergency Department, Military Hospital of Tunis, Tunis, Tunisia, [8] Department of Neuropsychology and Speech Therapy, Erasme Hospital, Université Libre de Bruxelles, Brussels, Belgium

Objective: The COVID-19 epidemic began in Tunisia in March 2020; health-care workers (HCWs) were suddenly confronted with a particularly stressful situation. The aim of this study was to assess the psychological responses of HCWs during the epidemic, determine the stressors and identify ways to cope.

Methods: This cross-sectional study used an online questionnaire that included 62 questions. ANOVAs and *t*-tests were used to compare the responses between professional groups, age groups, and genders.

Results: Questionnaires were completed by 368 HCWs. HCWs believed they had a social and professional obligation to continue working long hours (95.3%). They were anxious regarding their safety (93.7%) and the safety of their families (97.8%). Youthful age ($p = 0.044$) and female gender ($ps < 0.046$) were identified as stressors. The availability of personal protective equipment (PPE; 99.7%) and good communication between colleagues (98.1%) and managers (91.6%) were important protective factors. Family and friend support (95.9%), following strict protective measures (99.4%), knowing more about COVID-19 (94.8%), adopting a positive attitude (89.6%), and engaging in leisure activities (96.1%) helped in dealing with this epidemic.

Conclusion: This study highlights the importance of providing HCWs with infection control guidelines and adequate PPE. Communication and support within the team and maintaining family support help in coping with this stressful situation.

Keywords: COVID-19, coping, emotion, healthcare workers, stress

Edited by:
Ghayda Hassan,
Université du Québec à Montréal, Canada

Reviewed by:
Karen Herrera-Ferrá,
Mexican Association of Neuroethics (AMNE), Mexico
Hatta Sidi,
National University of Malaysia, Malaysia

****Correspondence:***
Hela Slama
slamahela2003@yahoo.fr

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *29 October 2020*
Accepted: *22 April 2021*
Published: *20 May 2021*

Citation:
Slama H, El Kefi H, Taamallah K, Stambouli N, Baffoun A, Samoud W, Bechikh C, Oumaya A, Lamine K, Hmida MJ, Slama H, Ferjani M and Gharsallah H (2021) Immediate Psychological Responses, Stress Factors, and Coping Behaviors in Military Health-Care Professionals During the COVID-19 Pandemic in Tunisia. Front. Psychiatry 12:622830. doi: 10.3389/fpsyt.2021.622830

INTRODUCTION

In November 2019, a new coronavirus disease (COVID-19) was reported for the first time and then became widespread in Wuhan, China. The disease spread rapidly across China and elsewhere and has created unprecedented challenges to health-care systems. The coronavirus epidemic reached Tunisia in March 2020, with the first case being detected on March 12. Given the magnitude of the global impact of this pandemic, total containment was declared on March 13, 2020 in Tunisia (1).

COVID-19 was an unknown and dangerous disease that our country had not faced before, and the Tunisian national health system was severely put under the test. Health-care workers (HCWs) were suddenly faced with a particularly stressful situation, with a high risk of contamination, insufficient access to protective equipment, physical exhaustion, social isolation, and extreme workload. HCWs have been redeployed to areas outside their usual clinical expertise, often working overtime, sometimes for a full week without returning home. Some HCWs were quickly contaminated, which led to anxiety within the teams. As a result, HCWs have experienced anxiety coexisting with prolonged conditions of uncertainty. Unfortunately, little is known about how best to prepare for and cope with these conditions and how to maximize the HCWs' health and well-being and their long-term psychological resilience. It has become clear to decision-makers that implementing an intervention that corresponds to HCWs' needs and expectations, to allow them to better live through this crisis and to continue to work effectively, has become an urgent matter. Before effective interventions can be developed to support health-care professionals, it is essential to understand the HCWs' specific sources of anxiety and concerns, which may vary from one culture or situation to another. Recognizing sources of stress allows decision-makers to develop appropriate ways to address these concerns and to provide specific support (2, 3). For a low-income country such as Tunisia, the focus was for the first time on the psychological state of health professionals and how to improve it.

Aim

The aim of this study is to identify the psychological responses, stress factors and coping strategies during the COVID-19 epidemic, in military health-care personnel in Tunisia.

METHODS

Study Design

We conducted a cross-sectional study over the course of 1 month from May 1 to May 31, 2020. We used an online questionnaire approved by the local ethics committee (local committee for the protection of personnel of the military hospital of TUNIS CLPP). All participants gave their informed consent electronically before answering the questionnaire online.

Inclusion/Exclusion Criteria and Procedure

Participants of the study were made up of active health-care staff [doctors, residents, nurses, medical technicians and administrative staff working in the medical departments (medical secretaries)], including frontline and non-frontline staff working at the military hospital in Tunis and in seven other military care structures throughout Tunisia (**Table 1**). Participants with incomplete responses to the questionnaire were excluded.

At the onset of the epidemic, all clinical staff were asked to work periodically in the COVID units. Therefore, we did not separate those who worked on the frontline from those who had not yet worked. At the time of the study, 109 health-care workers out of 368 had already worked in the COVID units (see **Table 1**, Work in COVID unit).

The questionnaire was emailed to health-care workers of the military health-care structures in Tunisia. For those who did not have an e-mail address, a phone message was sent with the link to the questionnaire.

Study Survey

The study survey included two parts:

- First part: Questions assessing socio-demographic data (e.g., age, sex, profession, education level, marital status)
- Second part: Questions assessing psychological responses, stress factors and coping strategies

As there were no COVID-19-specific, validated questionnaires in Arabic assessing psychological responses, stress factors and coping strategies, we developed an instrument based on consensus from a multidisciplinary team. The multidisciplinary team consisted of four psychiatrists, a neuropsychiatrist, three resuscitators, a researcher in biomedical sciences, and a medical director of care delivery from the hospital. A medical doctor in charge of the COVID unit conducted this study. The questionnaire was based on previous literature, knowledge of the field, linguistic and cultural aspects. The authors adapted a questionnaire previously developed by Lee et al. (2), which was used to assess medical staff during the 2003 Severe Acute Respiratory Syndrome (SARS) epidemic and consisted of 72 questions. The same questionnaire was modified to a 67-item questionnaire and was used by Haozheng Cai et al. (3) during the COVID-19 pandemic in March 2020 and was also used to develop this questionnaire. In a first step, the multidisciplinary team organized a debriefing with members of the medical staff. Topics related to their experience with this epidemic were discussed, such as their psychological experience, stress factors, coping strategies and possible prevention or intervention measures for staff. From this debriefing, 62 questions were selected, taking into account Tunisian cultural specificity and experience in the field at this time of the pandemic.

The questionnaire was comprised of four sections that explored immediate reactions to the mission of health-care workers during the COVID-19 outbreak, stressors, protective factors, coping behaviors and wellness resources. Each question had a four-point Likert scale [**0** = not at all; **1** = slightly (equivalent to mild); **2** = moderately; **3** = very much]. The percentage of participants for each item was calculated from the sum of positive responses (more than 0). The intensity or degree of importance of the item was calculated by averaging all the scores. The higher the mean, the more intense the item.

TABLE 1 | Medical staff demographics ($n = 368$).

Characteristic	Value
Mean age (years) ± SD	36.34 ± 11.14
Gender, *N* (%)	
Female	145 (39.4%)
Male	223 (60.6%)
Married, *N* (%)	211 (57.3%)
Having children, *N* (%)	203 (57.1%)
Life habit, *N* (%)	
Tobacco	69 (18.8%)
Alcohol	16 (4.3%)
Tobacco and alcohol	19 (5.2%)
Nothing	264 (71.7%)
Professional, *N* (%)	
Nurse	150 (40.8%)
Doctor	138 (37.5%)
Medical resident	34 (9.2%)
Medical technician	26 (7.1%)
Hospital staff	20 (5.4%)
Workspace, *N* (%)	
Military Hospital of Tunis	279 (75.8%)
Medical Centers of the Military Units	48 (13%)
Military Clinic	21 (5.7%)
Specialized Military Medical Center	12 (3.3%)
Military Hospital of Bizerte	6 (1.6%)
Military Hospital of Gabes	2 (0.5%)
Department, *N* (%)	
Medicine department	158 (42.9%)
Surgery department	58 (15.8%)
Intensive care unit	51 (13.9%)
Emergency department	29 (7.9%)
Laboratory	14 (3.8%)
Administration	13 (3.5%)
Others	45 (12.2%)
Work experience (years), mean (SD)	11.61 (9.92)
Work in COVID unit, *N* (%)	
Yes	109 (29.6%)
No	259 (70.4%)
Manage patient with suspected or confirmed coronavirus, *N* (%)	
Yes	168 (45.7%)
No	200 (54.3%)
Means of conveyance, *N* (%)	
Car	225 (61.1%)
Military bus	64 (17.4%)
Mass transit	62 (16.8%)
On foot	11 (3%)
Bike or motorcycle	6 (1.6%)

COVID-19, Coronavirus disease 2019; SD, Standard deviation.

Immediate Reactions to the Mission of Health-Care Workers During the COVID-19 Outbreak

The first section of the questionnaire consisted of 14 questions (Q1–Q14; **Table 2**). Ten questions examined cognitive, emotional reactions and avoiding behaviors of the HCWs during their work. Four questions explored their experiences and feelings pertaining to their families during this period, inspired by the Parental Burnout Assessment (PBA) (4). Indeed, during the debriefing with the multidisciplinary team, we noticed a major concern of the caregivers regarding their paternal function and their feeling of exhaustion.

Stressors

The second section examined 18 possible factors that could induce stress.

Protective Factors

The third section consisted of 16 questions aimed at identifying factors that could reduce stress.

Coping Behaviors Used by Health-Care Workers as a Resource for Well-Being

The fourth section consisted of 14 questions designed to identify coping behaviors in response to stress.

Statistical Analysis

Statistical analysis of the data was performed using SPSS 22.0 software. Descriptive statistics were used to present the data collected during the survey, all continuous variables were expressed as mean ± SD, and categorical variables as percentages. To compare responses across professional groups, age groups, and gender for the four sections of the second part of the questionnaire, mean comparisons were performed for each item. Student's *t*-tests, one-way analyses of variance (ANOVA) and Tukey's *post-hoc* tests for the most significant differences were used to analyze the data.

RESULTS

Demographic Characteristics

The demographic characteristics are shown in **Table 1**.

A total of 368 questionnaires were completed out of a total of 544 sent (67.6%). The mean age of the participants was 36.34 ± 11.14 years old (20–68 years old) with 60.6% being male. There was no difference in age between male and female participants. **Supplementary Table 1** shows demographic characteristics by gender. The percentage of married participants was 57.3% ($n = 211$) and 57.1% had at least one child ($n = 203$). Participants from the Military Hospital of Tunis were 75.8% ($n = 275$), while participants from the other medical centers of the military units represented 24.2% ($n = 89$). Professional work experience ranged from 0 to 40 years (11.6 ± 9.92 years).

Approximately half of the HCWs (52.2%) worked in COVID units or treated a confirmed or suspected case of COVID-19. **Supplementary Table 2** shows demographic characteristics in frontline and non-frontline workers.

During the study, all participants resided primarily in their homes. Travel to the hospital was done by personal means (car, motorcycle, bicycle, on foot) for 65.7% of the participants. Mass transit or military bus was used by the remaining 34.3%.

TABLE 2 | Immediate reactions to the mission of health-care workers during COVID-19 outbreak among professional groups.

	Mean (SD)*					*P*-value	Total mean (SD)*	Frequency** (%)
	Nurses *N* = 150	**Doctors** *N* = 138	**Residents** *N* = 34	**Health technicians** *N* = 26	**Administrators** *N* = 20			
Q1-You think that your current front-line job comes from your social and moral responsibility	2.1 (0.83)	2.25 (0.91)	1.52 (0.82)	2.13 (0.67)	2 (1.16)	0.001	2.1(0.89)	95.3
Q2-You have felt nervous or frightened in the ward	1.03 (0.77)	0.89 (0.69)	1.35 (0.72)	1.19 (0.89)	1.1 (1.07)	0.02	1.02 (0.77)	76.3
Q3-You were unhappy about working overtime during the outbreak	1.04 (0.8)	0.60 (0.94)	0.85 (0.92)	1 (0.93)	0.9 (0.91)	0.000	0.85 (0.82)	61.4
Q4-You expect recognition or receiving bonus or compensation for your work from the hospital authorities	1.20 (1.07)	0.68 (0.94)	1.05 (0.88)	0.8 (0.93)	1.35 (1.18)	0.000	0.97 (1.03)	58.4
Q5-You try to avoid COVID-19 positive patients or suspects of infection	1.08 (1.12)	0.68 (0.84)	1.11 (1.06)	1.69 (1.22)	1.85 (1.22)	0.000	1.02 (1.07)	58.4
Q6-You try to avoid your colleague working in COVID unit	0.8 (0.9)	0.53 (0.88)	0.73 (0.99)	1 (0.89)	1.4 (1.23)	0.001	0.75 (0.97)	45.9
Q7-You tried to avoid working in COVID unit	0.37 (21.7)	0.31 (0.70)	0.96 (1.08)	0.6 (1.09)	0.8 (1.19)	0.000	0.43 (0.85)	26.5
Q8-You want to stop your present job to avoid being at hospital	0.12 (0.38)	0.02 (0.14	0.14 (0.43)	0.15 (0.36)	0.8 (1.19)	0.000	0.12 (0.44)	9.5
Q9-You've been thinking about stopping your job if the epidemic suddenly gets worse	0.16 (0.49)	0.07 (0.26)	1.7 (0.45)	0.19 (0.36)	0.7 (1.03)	0.000	0.16 (0.48)	12.2
Q10-You feel angry because your workload is greater and more dangerous than other doctors who have not been exposed to COVID-19	0.8 (0.84)	0.56 (0.79)	0.79 (0.76)	0.57 (0.49)	0.75 (1.03)	0.127	0.69 (0.48)	50
Q11-When I come home, I feel unable to take care of my children or family members and have no energy	1.1 (1.03)	0.98 (0.88)	1.2 (1.03	1.26 (1.04)	1.25 (0.85)	0.423	1.10 (0.97)	68.7
Q12-I'm happy when I'm with my children and family members	1.4 (1.14)	2.17 (0.95)	1.73 (1.02	1.92 (1.09)	2.3 (0.92)	0.000	1.8 (0.97)	83.6
Q13-I no longer think I'm as good a mother/father as I have been to my kids	0.8 (0.88)	0.65 (0.86)	0.68 (0.87)	0.25 (0.44)	1.25 (0.95)	0.037	0.71 (1.09)	49.7
Q14-I feel that I take care of my children in a mechanical way and that I'm not able to show them my affection	1.07 (0.96)	0.78 (0.58)	0.82 (0.79)	0.8 (1.02)	0.95 (0.88)	0.08	0.91 (0.91)	59.7

SD, standard deviation.

**Mean of total score of the item [rated on a four-point scale (0 = not at all; 1 = slightly; 2 = moderately; 3 = very much)].*

***Frequency represents the number of subjects who responded more than 0 to the specific item.*

Immediate Reactions to the Mission of Health-Care Workers During the COVID-19 Outbreak

Table 2 indicates means, standard deviations, and frequency for the questions assessing the immediate reactions of health-care workers. Detailed means among professional groups are also presented in **Table 2**. Our results showed that 76.3% of participants felt nervous or frightened in the ward (Q2). There was a difference among the various health-care professions [$F_{(4,363)} = 2.96$; $p = 0.02$]. *Post-hoc* comparisons indicated that residents were more frightened than nurses ($p = 0.016$).

Responses were influenced by age [$F_{(3,364)} = 2.75$; $p = 0.04$], gender [$t_{(366)} = 4.435$, $p < 0.001$] but not by marital status ($p = 0.168$). *Post-hoc* comparisons indicated that HCWs over 50 years felt less nervous or frightened than those between 20 and 30 years old (0.77 ± 0.89 vs. 1.12 ± 0.79; $p = 0.033$). Women felt more nervous or frightened at work (1.24 ± 0.78 vs. 0.88 ± 0.74). Women were also more dissatisfied with working overtime [Q3; $t_{(366)} = 2.642$, $p = 0.009$; 0.99 ± 0.87 vs. 0.76 ± 0.78], and had a stronger desire to avoid working in the intensive care unit [Q7; $t_{(366)} = 2.586$, $p = 0.01$; 0.61 ± 0.91 vs. 0.35 ± 0.79].

The amount of avoidance behaviors was different among the professions [$F_{(4,300)} = 5.246$; $p < 0.001$]. *Post-hoc* comparison indicated that residents tried more to avoid working in the COVID units (Q7) compared to doctors ($p = 0.001$) and nurses ($p = 0.006$). Administrators showed a stronger desire to stop working in the hospital [Q8; $F_{(4,363)} = 2.655$; $p < 0.001$] compared to all other members of the medical staff (nurses, residents, doctors, health technicians; all ps < 0.001).

Compared with married staff, single individuals were less happy about working overtime during the outbreak [Q3; $t_{(366)} = 2.447$, $p = 0.015$; 0.97 ± 0.81 vs. 0.76 ± 0.82]. They adopted more avoidance behaviors such as avoiding suspect patients [Q5; $t_{(366)} = 2.227$, $p = 0.027$; 1.17 ± 1.09 vs. $0.91 \pm$

1.05] or avoiding colleagues working in the COVID units [Q6; $t_{(366)} = 2.052$, $p = 0.041$; 0.88 ± 1.02 vs. 0.67 ± 0.93].

Social and moral responsibility was present in 95.3% of healthcare workers (Q1). A significant difference was found between the different professional groups [$F_{(4, 363)} = 5.055$, $p = 0.001$]. Residents had the lowest social and moral responsibility among care givers with lower scores than nurses, doctors, and health technicians (all $ps < 0.006$) but not than administrators ($p = 0.763$).

While 58% of HCWs expected to receive recognition, bonuses or compensation for their work from hospital authorities (Q4), a significant difference was noted between the different professions [$F_{(4, 363)} = 5.732$, $p < 0.001$]. Nurses and administrators had more concerns regarding extra financial compensation during or after the outbreak compared to doctors ($p < 0.001$ and $p = 0.49$, respectively).

Regarding the four questions exploring the parents' experiences and their feelings, 83.6% of HCWs appear to be happy when they are in the presence of their family and children (Q12), but with significant differences between professional groups [$F_{(4, 363)} = 8.781$, $p < 0.001$]. Nurses were less happy than doctors and administrators ($p < 0.001$ and $p = 0.011$, respectively). More than half of the participants (59,6%) felt as though their caring for their children was mechanical without being able to show their love for them (Q14). In comparison with fathers, mothers had a stronger feeling of not being as good a parent as they were before the epidemic [Q13; $t_{(235)} = 2.165$, $p = 0.031$]. Participant felt that they could no longer care for their children and family and that they had no energy left (Q11; 68.7%). Women expressed this feeling more in comparison with men [$t_{(366)} = 3.058$, $p = 0.002$].

Stressors

Table 3 presents the stressor questions, mean scores and frequency of responses that were positive (more than 0). **Table 2** also presents the mean scores for stressors according to professional groups. Among the main stressors for HCWs we can point to concerns of infecting family members (S2; 97.8%; 2.68 ± 0.72), and colleagues (S1; 94%; 2.14 ± 0.96), concerns of making protection errors that could spread the disease (S4; 96.7%; 2.35 ± 1.39), lack of personal protective equipment (PPE) (S14; 92.1%; 2.24 ± 0.98) and death of their patients (S5; 94.3; 2.24 ± 0.93).

A difference was noted between the different members of medical staff concerning the uncertainty of when the epidemic would end [S6; $F_{(4, 363)} = 3.188$, $p = 0.014$]. Nurses were significantly less stressed by the uncertainty than doctors ($p = 0.028$). Stress induced by wearing PPE for long periods of time was also significantly influenced by profession [S15; $F_{(4, 363)} = 2.533$, $p = 0.04$]. Residents were less stressed than nurses by PPE ($p = 0.02$).

Women displayed higher mean scores for all stressors. These results were statistically significant for 13 of the 18 stressor questions (**Supplementary Table 3**).

Staff under 40 years of age were more concerned about infecting family members compared to staff over 50 years of age [S2; $F_{(3, 364)} = 3.526$, $p = 0.015$; *Post-hoc* p-values < 0.044]. We did not find any significant differences between age categories for other stressors.

For a detailed analysis of associations between highest stressors and immediate reactions of health-care workers see **Supplementary Table 4**.

Protective Factors

Table 4 presents the protective factor questions, mean scores and frequency of responses that were positive (more than 0). Among protective factors that can reduce the stress of HCWs we can point to good health of co-workers (P3; 97.6%; 2.73 ± 1.78), availability of PPE (P5; 99.7%; 2.67 ± 0.57), recovery of patients (P4; 98.9; 2.60 ± 0.66), decrease in the number of patients infected with SARS-COV2 (P12; 98.9%; 2.58 ± 0.66), support by colleagues and team spirit (P1; 98.1%; 2.50 ± 1.31) and ability to communicate with superiors and commanders (P14, 91.6%; 2.16 ± 0.94).

There were no significant differences between women and men for protective factors (all $ps > 0.05$)

Regarding age categories, obtaining a promotion or award [P13; $F_{(3, 364)} = 3.522$, $p = 0.015$] was less protective against stress for HCWs over 50 years old compared to HCWs under 40 years old (all $ps < 0.191$). Good quality of medical care provided to HCWs in case of COVID-19 contamination [P15; $F_{(3, 364)} = 4.244$, $p = 0.006$] was considered as a more important protective factor by HCWs over 50 years old compared to HCWs under 30 years old (2.55 ± 0.62 vs. 2.09 ± 0.96; $p = 0.008$).

Coping Behaviors Used by Health-Care Workers as A Resource for Well-Being

Table 5 presents the coping behavior questions, mean scores and frequency of responses that were positive (more than 0). Applying strict protective measures was an important factor in reducing stress (C1; 99.4%; 2.4 ± 0.68), followed by finding information on COVID-19 (C2; 94.8%; 2.06 ± 0.92). Among coping behaviors considered as important by HCWs we can point to performing leisure activities during their free time (C4; 96.2%; 1.95 ± 0.91), discussions with family and friends to relieve stress and obtain support (C5; 95.9%; 1.9 ± 0.88), adopting a positive attitude with self-motivation (C6; 89.6%; 1.62 ± 0.95) and religious practices (C13; 87.2%; 1.54 ± 0.96). Only, 27.17% of HCWs expressed a desire to consult a psychiatrist or a psychologist (C14; 0.35 ± 0.67). Mean scores for coping behaviors including following strict protective measures (C1), performing or participating in leisure activities (C4), discussions with family and friends to relieve stress and obtain support (C5), self-motivation and positive attitude (C6) did not differ between professional groups (all $ps > 0.05$).

Coping behaviors differed by gender (**Table 5**). Women displayed higher scores for following strict protective measures (C1; $p = 0.002$), shouting and crying to relieve emotions (C9; $p < 0.001$), and the use of medical and homeopathic treatments (C11; $p < 0.001$). Men showed higher scores for tobacco or alcohol use (C12; $p < 0.001$).

Differences were found between age groups for coping behaviors. HCWs over 50 years old were less likely to avoid doing overtime [C7; $F_{(3, 364)} = 3.861$, $p = 0.01$] and avoid media news

TABLE 3 | Stressors during the COVID-19 pandemic among professional groups.

	Mean (SD)*					P-value	Total mean* (S.D.)	Frequency** [N (%)]
	Nurse (N = 150)	Doctor (N = 138)	Resident doctor (N = 34)	Health technician (N = 26)	Administrative (N = 20)			
S1-Infection of a co-worker	2.17 (1.00)	2.02 (0.95)	2.44 (0.82)	2.26 (0.77)	2.10 (1.07)	0.192	2.14 (0.96)	346 (94.0)
S2-Worried about infecting family	2.69 (0.75)	2.68 (0.66)	2.91 (0.37)	2.65 (0.68)	2.30 (1.17)	0.058	2.68 (0.72)	360 (97.8)
S3-Worried about getting infected	2.08 (0.95)	1.92 (0.90)	1.88 (0.91)	2.00 (1.05)	1.95 (1.23)	0.667	1.99 (0.95)	345 (93.7)
S4-The occurrence of errors at work that can lead to infections	2.34 (0.89)	2.43 (1.94)	2.09 (0.92)	2.34 (0.97)	2.36 (0.83)	0.814	2.35 (1.39)	356 (96.7)
S5-Watching infected patients die	2.17 (1.06)	2.34 (0.80)	2.32 (0.83)	2.06 (0.88)	2.00 (1.00)	0.445	2.24 (0.93)	347 (94.3)
S6-Not knowing when the outbreak will be contained	1.12 (1.10)	1.50 (1.08)	1.67 (0.97)	1.50 (1.14)	1.40 (1.23)	0.014	1.35 (1.10)	259 (70.5)
S7-Participating in the management of infected patients	1.14 (1.31)	1.15 (1.04)	1.58 (0.98)	1.50 (1.14)	1.14 (1.25)	0.219	1.22 (1.17)	238 (64.7)
S8-Lack of specific treatment for COVID	2.08 (0.98)	2.08 (0.92)	1.91 (0.99)	2.50 (0.76)	2.05 (0.94)	0.197	2.09 (0.95)	345 (93.7)
S9-The daily report of the number of new infected cases	2.15 (0.91)	2.18 (1.17)	2.11 (0.80)	2.38 (0.80)	2.25 (0.85)	0.843	2.18 (1.00)	351 (95.4)
S10-Feeling exhausted	1.88 (1.00)	1.65 (1.01)	1.44 (1.02)	1.84 (1.08)	1.75 (1.06)	0.130	1.75 (1.02)	234 (88.0)
S11-Observing symptoms of the disease in your colleagues	1.98 (1.03)	2.00 (0.89)	2.00 (0.98)	2.11 (0.90)	2.20 (1.05)	0.873	2.01 (0.96)	341 (92.7)
S12-Developing symptoms of the disease	2.00 (1.83)	2.10 (0.86)	2.11 (0.84)	2.03 (1.07)	2.25 (1.01)	0.804	2.07 (0.97)	338 (91.8)
S13-Seeing stress or fear from colleagues	1.98 (0.98)	1.89 (0.88)	1.73 (0.96)	2.00 (0.93)	2.00 (0.97)	0.648	1.92 (0.93)	341 (92.7)
S14-Lack of means and protective clothing	2.37 (0.95)	2.26 (0.91)	1.94 (1.07)	2.07 (1.16)	1.95 (1.09)	0.077	2.24 (0.98)	339 (92.1)
S15-Wearing protective clothing for a long time	1.68 (1.07)	1.73 (0.93)	2.26 (0.79)	1.61 (1.13)	1.70 (1.17)	0.040	1.75 (1.01)	317 (86.1)
S16-Working outside of the team and the regular department	1.52 (1.06)	1.39 (1.00)	1.76 (1.01)	1.69 (1.01)	1.25 (1.16)	0.217	1.49 (1.04)	294 (79.9)
S17-Being repeatedly screened for infection	1.32 (1.17)	1.13 (1.00)	1.17 (1.02)	1.11 (1.10)	1.25 (1.20)	0.651	1.21 (1.09)	245 (66.6)
S18-Mandatory sanitary confinement	1.63 (1.13)	1.51 (1.14)	1.58 (1.07)	1.53 (1.13)	1.65 (1.08)	0.923	1.57 (1.12)	284 (77.2)

S, Stressor; SD, standard deviation.

**Mean of total score of the item [rated on a four-point scale (0 = not at all; 1 = slightly; 2 = moderately; 3 = very much)].*

***Frequency represents the number of subjects who responded more than 0 to the specific item.*

[C8; $F_{(3,364)} = 4.285$, $p = 0.005$] compared to participants aged 20–30 years old ($p = 0.009$; $p = 0.026$).

Comparison Between Frontline and Non-Frontline Staff

Supplementary Table 5 presents mean scores of frontline and non-frontline workers for the different items of the questionnaire. Concerning immediate reactions, staff working in COVID units (frontline workers) were unhappier about working overtime during the outbreak [Q3; $t_{(366)} = 2.775$, $p = 0.006$], felt angrier because the workload was greater and more dangerous than for other doctors who had not been exposed to COVID-19 [Q10; $t_{(366)} = 2.513$, $p = 0.012$], had a stronger feeling of no longer being able take care of their children and family and had no energy left [Q11; $t_{(366)} = 2.336$, $p = 0.021$] and felt less happy when they were with their children and family members [Q12; $t_{(366)} = -2.499$, $p = 0.013$].

Concerning stressors, frontline workers felt less stressed by the daily report of the number of new infected cases [S9; $t_{(366)} = -2.302$, $p = 0.022$], about developing symptoms of the disease [S12; $t_{(366)} = -1.982$, $p = 0.049$], and by the lack of means and protective clothing [S14; $t_{(366)} = -2.307$, $p = 0.022$]. However, frontline workers felt more stressed about seeing stress or fear from colleagues [S13; $t_{(366)} = 2.038$, $p = 0.042$] and wearing protective clothing for a long time [S15; $t_{(366)} = 2.072$, $p = 0.039$].

For protective factors, only practice putting on protective gear was scored higher by frontline workers [P6; $t_{(366)} = 2.268$, $p = 0.024$].

No difference was noted between the two groups for coping behaviors except for avoiding media news about COVID-19 and related fatalities [C8; $t_{(366)} = 2.215$, $p = 0.028$], which was higher in frontline workers.

DISCUSSION

In Tunisia, during the COVID-19 pandemic, HCWs faced a particularly stressful situation, with a high risk of contamination, inadequate access to PPE, and social isolation, with the consequent emergence of anxiety and depressive symptoms. Searching the epidemiological literature on disease outbreaks, we found a paucity of studies regarding psychiatric services in similar situations (5, 6). This study represents a necessary effort to address the needs of HCWs in an attempt to develop

TABLE 4 | Protective factors during the COVID-19 pandemic.

	Mean (SD)*	Frequency** [*N* (%)]
P1-Support by colleagues and team spirit	2.50 (1.31)	361 (98.1)
P2-Discussions and jokes between colleagues	2.48 (0.73)	362 (98.4)
P3-The good health of colleagues	2.73 (1.78)	399 (97.6)
P4-Improvement of patient's health and recovery	2.60 (0.66)	364 (98.9)
P5-Availability of protection means	2.67 (0.57)	367 (99.7)
P6-Practice putting on protective gear	2.41 (0.77)	357 (97.0)
P7-Taking preventive treatment	1.84 (1.09)	308 (83.7)
P8 Stress management training	2.09 (0.95)	342 (92.9)
P9-Implementation by the hospital of procedures to combat COVID-19	2.34 (0.82)	355 (96.5)
P10 -Having information about the virus from reliable sources	2.32 (0.86)	351 (95.4)
P11-The good health of your family members	2.01 (0.96)	364 (98.9)
P12-Decrease in the number of infected patients	2.58 (0.66)	364 (98.9)
P13-Obtaining a professional promotion or an incentive bonus	1.67 (1.22)	267 (72.6)
P14-The ability to communicate with superiors and commanders	2.16 (0.94)	337 (91.6)
P15-Confidence in the quality of medical care provided by the hospital to infected health-care personnel	2.25 (0.88)	350 (95.1)
P16-Quality and improved meals in times of pandemic	1.57 (1.12)	316 (85.9)

P, protective factor.
**Mean of total score of the item [rated on a four-point scale (0 = not at all; 1 = slightly; 2 = moderately; 3 = very much)].*
***Frequency represents the number of subjects who responded more than 0 to the specific item.*

cognitive, emotional and interpersonal skills that promote adaptive responses and contribute to both organizational and personal resilience.

We found that HCWs felt nervous or frightened in 76.3% of cases, which has been supported by previous studies, although their extent differs (7, 8). After the Middle East Respiratory Syndrome (MERS) epidemic in Korea in 2015, healthcare workers caring for MERS patients experienced higher rates of psychological distress than their counterparts not involved in MERS-related tasks (9). Specifically, these HCWs showed increased rates of sleep problems, hyperarousal and avoidance. Liu et al. recently identified stress-related symptom rates of 73.4%, anxiety rates of 44.7%, depression rates of 50.7%, and insomnia rates of 36.1% among 1,563 medical staff as a result of this epidemic (10). A recent study in China found that approximately half of the surveyed health-care workers reported moderate to severe anxiety symptoms, and approximately one-third reported a moderate to severe psychological impact (11). With regard to the situation in Italy, the risks of acute stress disorder, burnout, and full psychiatric disorders are currently very high among HCWs (12). During the 2003 SARS outbreak in Canada, Maunder et al. found that a stress management model was useful in describing expected stress reactions and helping staff adapt rather than considering these reactions as pathological (13).

The most important factors that motivated HCWs were their social and moral responsibilities, similar to what has been reported in Hunan during the COVID-19 epidemic and in other studies (7, 8). A sense of purpose and altruism are key factors of resilience. However, anxiety, fear, and anger can easily overwhelm them during a major public health emergency. Hobfoll et al. identified self-efficacy, instillation of hope, and social connectedness as being among the crucial elements for promoting resilience in populations affected by mass trauma (14). According to Albot et al., self-efficacy is probably the most important skill for HCWs (15).

Our results show that the most stressed are medical residents, young HCWs and women. After the 2003 SARS outbreak, Tam et al. found similar results: worse psychological outcomes were seen in HCWs that were of a younger age, female, nursing professionals, and those with poorer physical health (16). Many studies reiterated these findings: staff who were women (17–19) younger (20–25) or parents of dependent children were more vulnerable to psychological distress (7–13). Several studies reported that women were more vulnerable to stress, probably owing to their heavier family responsibilities. Those who had children showed a higher risk of stress because of the fear of infecting their children and the family stigma of not being able to care for their children if they were contaminated (7, 16). Within several findings, nurses were generally more at risk for stress than doctors (26–28), apart from two studies that reported the opposite conclusions (29, 30).

In our study, nurses were not more nervous or frightened than doctors, perhaps because doctors had a deep understanding of the dangers of COVID-19, so they were more prone to anxiety and fear (28).

Staff who were older or who had greater clinical experience experienced less stress and less anxiety, which is in agreement with other findings (16, 20, 31, 32). The exceptions were in two studies of staff caring for patients with COVID-19, when older age was a risk factor for psychological symptoms (23, 33).

Keeping their families safe from infection was a main concern of HCWs. Goulia et al. reported similar results during the A/H1N1 influenza pandemic (26). Ensuring the care of HCW

TABLE 5 | Coping factors during covid 19 pandemic by gender.

	Mean (S.D.)*		Total mean* (S.D.)	Frequency** %	*P*-value
	Women ($N = 145$)	Men ($N = 223$)			
C1-Following strict protective measures, such as hand washing, masks, face masks, protective clothing, etc.	2.62 (0.60)	2.4 (0.72)	99.4	2.4 (0.68)	0.002
C2-Learning about COVID-19, its prevention and mechanism of transmission	2.06 (0.87)	2.06 (0.95)	94.8	2.06 (0.92)	0.98
C3-Choosing a more single mode of travel, such as self-driving, and avoid transportation such as subways	2.53 (0.81)	2.35 (0.87)	95.6	2.4 (0.85)	0.055
C4-Doing leisure activities in your free time, such as watching movies, reading, etc.	1.87 (0.88)	2.01 (0.92)	96.1	1.95 (0.91)	0.15
C5-Chatting with family and friends to relieve stress and obtain support	1.9 (0.86)	1.99 (0.89)	95.9	1.9 (0.88)	0.49
C6-Talking to and motivating yourself to face the COVID-19 outbreak with positive attitude	1.65 (0.93)	1.6 (0.97)	89.6	1.62 (0.95)	0.62
C7-Avoiding overtime to reduce exposure to COVID-19 patients in hospital	1.24 (0.87)	1.12 (1.04)	72	1.17 (0.98)	0.21
C8-Avoiding media news about COVID-19 and related fatalities	1.4 (0.90)	1.26 (1.02)	79	1.3 (0.97)	0.19
C9-Venting emotions by crying, screaming etc.	0.76 (0.85)	0.29 (0.65)	33.6	0.47 (0.77)	<0.001
C10-Using means of relaxation and stress management	1.09 (0.90)	0.98 (0.91)	68.7	1.02 (0.90)	0.25
C11-Using treatments or phytotherapy	0.64 (0.89)	0.33 (0.68)	31.2	0.45 (0.97)	<0.001
C12-Drinking alcohol or smoking	0.17 (0.58)	0.51 (0.86)	23.3	0.38 (0.78)	<0.001
C13-Religious practices: prayer, fast,…	1.68 (0.92)	1.45 (0.98)	87.2	1.54 (0.96)	0.02
C14-Seeking help from a psychiatrist or psychologist	0.42 (0.67)	0.30 (0.66)	27.17	0.35 (0.67)	0.12

C, coping factor.

**Mean of total score of the item [rated on a four-point scale (0 = not at all; 1 = slightly; 2 = moderately; 3 = very much)].*

***Frequency represents the number of subjects who responded more than 0 to the specific item.*

family members would enhance workforce confidence and availability, but the feasibility and advisability of family priority is yet to be determined (34).

Other major stressors were concerns of committing aseptic errors that could spread the disease, lack of PPE, and seeing their patients die or their colleagues contaminated. These findings have been reported in numerous studies, which have highlighted that access to adequate PPE and better control of disease transmission improved the psychological state of HCWs (8, 13, 16, 18, 35–37).

Another important stress factor is physical exhaustion. This involves arranging working time for caregivers with regular breaks. Some HCWs may need alternative housing to reduce the risk of contamination of family members (38). During these breaks, HCWs should be provided with food, with the opportunity to contact their families to alleviate concerns. During infectious disease epidemics, support from family and friends, as well as a positive attitude, has previously been shown to reduce stress (39). Similar results were also found in our study. Positive attitudes and discussions with family and friends were key elements of coping among HCWs.

In addition to these factors, we found that the ability to communicate with leaders reduces stress, which is consistent with the results of previous studies. Clear communication with regular and accurate updates on the epidemic should be provided to HCWs to address their uncertainty and fear (39). Tait Shanafelt et al. asked HCWs about the demands they made on their leaders during the COVID-19 pandemic and summarized them in 5 points: listen to me, protect me, prepare me, support me, and take care of me. HCWs want to be part of the development of plans and strategies to respond to the pandemic. A final request from health professionals—even if only implicitly acknowledged—is "honor me" (40). Honor is a powerful expression of gratitude and could be used to strengthen the compassion of HCWs who risk their lives on the job.

Another key component of a coping strategy is religious practice, which contributed to reduced stress for 87.2% of participants. This seems to be a specificity of our population. Shechter et al. found similar results: engaging with faith-based religion and/or spirituality (23%), yoga (25%), and/or meditation (23%) were major coping behaviors among HCWs (41). Albott et al. reported that spending time with religious, faith-based or spiritual practice is one of the factors of resilience (15). Learning mindfulness techniques for HCWs could also be of help (42).

Few HCWs (27.17%) expressed a desire to consult a psychiatrist or psychologist to reduce their stress, which is concordant with the findings of Chen Q. In China, medical staff are less likely to seek help from a psychologist or to express their emotions when compared with medical staff in Western countries. Many HCWs mentioned that they did not need a psychologist but needed more rest and enough PPE (6).

We found little to no differences between exposed and non-exposed health-care workers, confirming that, at the onset of the pandemic, the whole health-care system was impacted by the COVID-19 epidemic. Frontline workers felt more heavily the workload and consequences on their family life as in previous works (43). They felt less stressed about developing symptoms but had concerns about seeing stress or fear from colleagues and wearing protective clothing for a long time. Concerning coping behaviors, they avoided media news more. A study comparing healthcare workers with high- and low-risk exposure during the peak of the 2003 SARS outbreak, also found similarly elevated levels of perceived stress at the onset of the epidemic (44). However, in a 1-year follow-up, perceived stress decreased in the low-risk group, but increased in the high-risk group with significantly greater depression ratings at 1-year follow-up, which was partially mediated by stress related to contact with SARS (44). In the 1–2 years following the outbreak, frontline workers had higher levels of distress and PTSD. These results suggest that working in the front line is not an independent risk factor for worse mental health outcomes at the onset of the epidemic but can become one later in time.

The stress factors and the measures that can reduce stress were thus similar in Tunisia as in other countries affected by COVID-19. In addition to the coping behaviors found in other countries, some coping factors appeared to be specific to our population, such as the roles of family and friend support and religious and faith practice. Furthermore, we have evidenced little demand for psychological support, contrary to Western literature. Although in our context, mental illness is increasingly accepted and psychiatrists are increasingly consulted, HCWs wanted to seek the help of a psychologist or psychiatrist only in about one-third of the cases. For this reason, the psychological support offered by our institution has not been well-accepted by the HCWs.

Limitations

This is a short-term (1 month) cross-sectional observational study. However, the psychological impact of COVID-19 may increase in the near future, implying the need for future studies.

In conclusion, major sources of psychological distress among HCWs are young age, female gender, lack of work experience, and fear for the safety of the family. Protective factors are availability of PPE, reassurance about family welfare, clear communication with leaders and access to reliable information. Coping behaviors adopted by HCWs are mainly based on family and friend exchanges and religious and spiritual practices rather than assistance from psychiatrists or psychologists. Learning mindfulness techniques for HCWs could also be of help.

An effective intervention for this case highlights a need to pay attention to a vulnerable group that includes the youngest and women. Identification of vulnerable individuals must be performed early for a better intervention, especially because stress could predispose them to depression and anxiety in the coming months (45). Results indicate that clear and empowering communication with leaders would be of great help to HCWs and that the mentoring of younger professionals by their elders is essential.

We believe that these results are important because, thanks to these findings, we have been able to establish recommendations and a strategy for improving the resilience of HCWs (see Psychosocial accompaniment and support in **Supplementary Material**). We hope that these findings will help decision-makers promote the will to protect HCWs in the current and future epidemics. As a hospital, patient care quality has to be at the center of its mission, and so, the safety and resilience of those delivering that care is intrinsically related to the level of quality. A burned out, stressed out, overworked, under-appreciated and anxious care giver ultimately will give compromised care.

This study has been of great help to us in dealing now with the second health crisis (second wave of this epidemic, which is more serious and more threatening). A long-term evaluation of this intervention is needed.

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.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by local committee for the protection of personnel of the military hospital of TUNIS CLPP. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

HeS, HE, and HG: study design, data collection, data analysis, statistical analyses, and manuscript writing. KT and NS: study design, statistical analyses, and manuscript writing. AB, WS, CB, and HiS: statistical analyses and manuscript writing. AO, KL, MH, and MF: manuscript writing. All authors contributed to the article and approved the submitted version.

ACKNOWLEDGMENTS

The authors thank Jeromy Hrabovecky for proofreading and language editing in this article.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.622830/full#supplementary-material

REFERENCES

1. National Observatory of New and Emerging Diseases. *COVID-19 in Tunisia, Situation Update of May 28, 2020*. (2020). Available online at: https://www.onmne.tn/wp-content/uploads/2020/10/COVID-19-dernier-bulletin-28052020.pdf (accessed May 29, 2020).
2. Lee SH, Juang YY, Su YJ, Lee HL, Lin YH, Chao CC. Facing SARS: psychological impacts on SARS team nurses and psychiatric services in a Taiwan general hospital. *Gen Hosp Psychiatry*. (2005) 27:352–8. doi: 10.1016/j.genhosppsych.2005.04.007
3. Haozheng C, Baoren T, Jing M, Limin C, Lei F, Yongfang J, et al. Psychological impact and coping strategies of frontline medical staff in Hunan between January and March 2020 during the outbreak of coronavirus disease 2019 (COVID-19) in Hubei, China. *Med Sci Monit*. (2020) 26:e924171. doi: 10.12659/MSM.924171
4. Roskam I, Raes ME, Mikolajczak M. Exhausted parents: development and preliminary validation of the parental burnout inventory. *Front Psychol*. (2017) 8:163. doi: 10.3389/fpsyg.2017.00163
5. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. (2020) 3:e203976. doi: 10.1001/jamanetworkopen.2020.3976
6. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, et al. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry*. (2020) 7:e15–6. doi: 10.1016/S2215-0366(20)30078-X
7. Koh D, Lim MK, Chia SE, Ko SM, Qian F, Ng V, et al. Risk perception and impact of severe acute respiratory syndrome (SARS) on work and personal lives of health care workers in Singapore: what can we learn? *Med Care*. (2005) 43:676–82. doi: 10.1097/01.mlr.0000167181.36730.cc
8. Khalid I, Khalid TJ, Qabajah MR, Barnard AG, Qushmaq IA. Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. *Clin Med Res*. (2016) 14:7–14. doi: 10.3121/cmr.2016.1303
9. Lee SM, Kang WS, Cho AR, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Compr Psychiatry*. (2018) 87:123–7. doi: 10.1016/j.comppsych.2018.10.003
10. Liu S, Yang L, Zhang C, Xiang YT, Liu Z, Hu S, et al. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry*. (2020) 7:e17–8. doi: 10.1016/S2215-0366(20)30077-8
11. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health*. (2020) 17:1729. doi: 10.3390/ijerph17051729
12. Sani G, Janiri D, Di Nicola M, Janiri L, Ferretti S, Chieffo D. Mental health during and after the COVID-19 emergency in Italy. *Psychiatry Clin Neurosci*. (2020) 74:372. doi: 10.1111/pcn.13004
13. Maunder RG, Lancee WJ, Rourke S, Hunter JJ, Goldbloom D, Balderson K, et al. Factors associated with the psychological impact of severe acute respiratory syndrome on nurses and other hospital workers in Toronto. *Psychosom Med*. (2004) 66:938–42. doi: 10.1097/01.psy.0000145673.84698.18
14. Hobfoll SE, Watson P, Bell CC, Bryant RA, Brymer MJ, Friedman MJ, et al. Five essential elements of immediate and mid-term mass trauma intervention: empirical evidence. *Psychiatry*. (2007) 70:283–369. doi: 10.1521/psyc.2007.70.4.283
15. Albott CS, Wozniak JR, Mc Glinch BP, Wall MH, Gold BS, Vinogradov S. Battle buddies: rapid deployment of a psychological resilience intervention for healthcare workers during the COVID-19 pandemic. *Anesth Analg*. (2020) 131:43–54. doi: 10.1213/ANE.0000000000004912
16. Tam CW, Pang EP, Lam LC, Chiu HF. Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: stress and psychological impact among frontline healthcare workers. *Psychol Med*. (2004) 34:1197–204. doi: 10.1017/S0033291704002247
17. Tang L, Pan L, Yuan L, Zha L. Prevalence and related factors of post-traumatic stress disorder among medical staff members exposed to H7N9 patients. *Int J Nurs Sci*. (2016) 4:63–7. doi: 10.1016/j.ijnss.2016.12.002
18. Bukhari EE, Temsah MH, Aleyadhy AA, Alrabiaa AA, Alhboob AA, Jamal AA, et al. Middle East respiratory syndrome coronavirus (MERS-CoV) outbreak perceptions of risk and stress evaluation in nurses. *J Infect Dev Ctries*. (2016) 10:845–50. doi: 10.3855/jidc.6925
19. Zhu Z, Xu S, Wang H, Liu Z, Wu J, Li G, et al. COVID-19 in Wuhan: sociodemographic characteristics and hospital support measures associated with the immediate psychological impact on healthcare workers. *EClinicalMedicine*. (2020) 24:100443. doi: 10.1016/j.eclinm.2020.100443
20. Chong MY, Wang WC, Hsieh WC, Lee CY, Chiu NM, Yeh WC, et al. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. *Br J Psychiatry*. (2004) 185:127–33. doi: 10.1192/bjp.185.2.127
21. Austria-Corrales F, Cruz-Valdés B, Herrera-Kiengelher L, Vázquez-García JC, Salas-Hernández J. Burnout syndrome among medical residents during the influenza A H1N1 sanitary contigency in Mexico. *Gac Med Mex*. (2011) 147:97–103.
22. Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, et al. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. *CMAJ*. (2004) 170:793–8. doi: 10.1503/cmaj.1031077
23. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *Can J Psychiatry*. (2009) 54:302–11. doi: 10.1177/070674370905400504
24. Sim K, Chong PN, Chan YH, Soon WS. Severe acute respiratory syndrome related psychiatric and post traumatic morbidities and coping responses in medical staff within a primary health care setting in Singapore. *J Clin Psychiatry*. (2004) 65:1120–7. doi: 10.4088/JCP.v65n0815
25. Matsuishi K, Kawazoe A, Imai H, Ito A, Mouri K, Kitamura N, et al. Psychological impact of the pandemic (H1N1) 2009 on general hospital workers in Kobe. *Psychiatry Clin Neurosci*. (2012) 66:353–60. doi: 10.1111/j.1440-1819.2012.02336.x
26. Goulia P, Mantas C, Dimitroula D, Mantis D, Hyphantis T. General hospital staff worries, perceived sufficiency of information and associated psychological distress during the A/H1N1 influenza pandemic. *BMC Infect Dis*. (2010) 10:322. doi: 10.1186/1471-2334-10-322
27. Wong TW, Yau JK, Chan CL, Kwong RS, Ho SM, Lau CC, et al. The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *Eur J Emerg Med*. (2005) 12:13–8. doi: 10.1097/00063110-200502000-00005
28. Poon E, Liu KS, Cheong DL, Lee CK, Yam LY, Tang WN. Impact of severe respiratory syndrome on anxiety levels of front-line health care workers. *Hong Kong Med J*. (2004) 10:325–30.
29. Chan AOM, Huak CY. Psychological impact of the 2003 severe acute respiratory syndrome outbreak on health care workers in amedium size regional general hospital in Singapore. *Occup Med*. (2004) 54:190–6. doi: 10.1093/occmed/kqh027
30. Lung FW, Lu YC, Chang YY, Shu BC. Mental symptoms in different health professionals during the SARS attack: a follow-up study. *Psychiatr Q*. (2009) 80:107–16. doi: 10.1007/s11126-009-9095-5
31. Oh N, Hong N, Ryu DH, Bae SG, Kam S, Kim KY. Exploring nursing intention, stress, and professionalism in response to infectious disease emergencies: the experience of local public hospital nurses during the 2015 MERS outbreak in South Korea. *Asian Nurs Res*. (2017) 11:230–6. doi: 10.1016/j.anr.2017.08.005
32. Lancee WJ, Maunder RG, Goldbloom DS, Coauthors for the Impact of SARS Study. Prevalence of psychiatric disorders among Toronto hospital workers one to two years after the SARS outbreak. *Psychiatr Serv*. (2008) 59:91–5. doi: 10.1176/ps.2008.59.1.91
33. Xing J, Sun N, Xu J, Geng S, Li Y. Study of the mental health status of medical personnel dealing with new coronavirus pneumonia. *PLoS ONE*. (2020) 15:e0233145. doi: 10.1371/journal.pone.0233145
34. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. *JAMA*. (2020) 323:1439–40. doi: 10.1001/jama.2020.3972
35. Kim JS, Choi JS. Factors influencing emergency nurse's burnout during an outbreak of middle east respiratory syndrome coronavirus in Korea. *Asian Nurs Res*. (2016) 10:295–9. doi: 10.1016/j.anr.2016.10.002
36. Wong WC, Lee A, Tsang KK, Wong SY. How did general practitioners protect themselves, their family, and staff during the

SARS epidemic in Hong Kong? *J Epidemiol Community Health.* (2004) 58:180–5. doi: 10.1136/jech.2003.015594

37. Chan SS, Leung GM, Tiwari AF, Salili F, Leung SS, Wong DC, et al. The impact of work-related risk on nurses during the SARS outbreak in Hong Kong. *Fam Community Health.* (2005) 28:274–87. doi: 10.1097/00003727-200507000-00008
38. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on health care workers: rapid review and meta-analysis. *BMJ.* (2020) 369:m1642. doi: 10.1136/bmj.m1642
39. Xiang YT, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry.* (2020) 7:228–9. doi: 10.1016/S2215-0366(20)30046-8
40. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA.* (2020) 323:2133–4. doi: 10.1001/jama.2020.5893
41. Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, et al. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. *Gen Hosp Psychiatry.* (2020) 66:1–8. doi: 10.1016/j.genhosppsych.2020.06.007
42. Sidi H. The psychological sequelae during mental health and COVID-19 pandemic: learning from the past for today's coping styles. *Med and Health.* (2020) 15:1–4. doi: 10.17576/MH.2020.1501.01
43. Lu W, Wang H, Lin Y, Li L. Psychological status of medical workforce during the COVID-19 pandemic: a cross-sectional study. *Psychiatry Res.* (2020) 288:112936. doi: 10.1016/j.psychres.2020.112936
44. McAlonan GM, Lee AM, Cheung V, Cheung C, Tsang KW, Sham PC, et al. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Can J Psychiatry.* (2007) 52:241–7. doi: 10.1177/070674370705200406
45. Woon LS, Sidi H, Nik-Jaafar NR, Leong-Bin-Abdullah MFI. Mental health status of university healthcare workers during the COVID-19 pandemic: a post-movement lockdown assessment. *Int J Environ Res Public Health.* (2020) 17:9155. doi: 10.3390/ijerph17249155

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.

frontiers in Public Health

SYSTEMATIC REVIEW
published: 21 May 2021
doi: 10.3389/fpubh.2021.629236

Rapid Evidence Assessment of Mental Health Outcomes of Pandemics for Health Care Workers: Implications for the Covid-19 Pandemic

Sara Waring and Susan Giles*

Department of Psychological Sciences, University of Liverpool, Liverpool, United Kingdom

Background: Little is known about the long-term mental health (MH) impact of the Covid-19 pandemic on health care workers (HCWs). However, synthesizing knowledge from past pandemics can help to anticipate this, along with identifying interventions required, when, and target populations most in need. This paper provides a balanced evaluation of what is currently known about short- and long-term MH impacts of pandemics on HCWs and effect of methodological limitations on knowledge claims.

Method: A rapid evidence assessment (REA) was conducted on 41 studies published in the past two decades that examined MH outcomes for HCWs in relation to pandemics.

Results: Findings of literary synthesis highlight common MH outcomes across pandemics, including increased stress, distress, burnout, and anxiety in the short-term, and post-traumatic stress and depression in the long-term. Findings also show the key role that organizations and public health bodies play in promoting adaptive coping and reducing health worries and the emotional and psychological distress caused by this. Evidence highlights particular groups at risk of developing MH issues (contact with patients that are infected, having children), and time points where risk may increase (initial response phase, when quarantined). However, inconsistencies in measures, analysis, and reporting all create limitations for pooling data.

Conclusions: Findings can be used by researchers to provide a knowledge framework to inform future research that will assist HCWs in responding to pandemics, and by policy makers and service planners to provide an evidence-led brief about direction and evidence base for related policy initiatives, interventions or service programmes.

Keywords: health care workers, pandemic, mental health outcomes, rapid evidence assessment, COVID-19

Edited by:
Ghayda Hassan,
Université du Québec à Montréal, Canada

Reviewed by:
Jose A. Piqueras,
Miguel Hernández University of Elche, Spain
Shuai Xu,
Case Western Reserve University, United States

****Correspondence:***
Sara Waring
s.k.waring@liverpool.ac.uk

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Public Health

Received: *13 November 2020*
Accepted: *14 April 2021*
Published: *21 May 2021*

Citation:
Waring S and Giles S (2021) Rapid Evidence Assessment of Mental Health Outcomes of Pandemics for Health Care Workers: Implications for the Covid-19 Pandemic. Front. Public Health 9:629236. doi: 10.3389/fpubh.2021.629236

BACKGROUND

Previous pandemics have posed substantial risks to health care workers' (HCWs) physical (1–4) and mental health (5–8), even causing some to question career choices and affecting ability to treat patients (9–16). Whilst little is known about what the long-term mental health (MH) impacts of responding to Covid-19 will be, synthesizing knowledge from past pandemics that share similar features can help to anticipate this. Indeed, findings from a recent rapid evidence assessment (REA) and meta-analysis conducted by Kisely et al. (17) provide an informative overview of the short-term psychological effects of emerging virus outbreaks on HCWs. The review highlighted that HCWs were at risk of experiencing psychological distress, which was increased by exposure to patients with the disease, younger age, having dependent children, stigma, spending longer in quarantine, and limited support. The following paper seeks to build on this body of work, adopting an REA approach to focus specifically on pandemics and MH outcomes over time, from peak response and recovery, through to longer-term. The aim is to provide a critical and balanced assessment of what is currently known, methodological strengths and limitations, and recommendations for improving research quality within the fast-paced, dynamic context of pandemics. Findings will also pose important implications for identifying the form of interventions required for HCWs responding to Covid-19, target populations most in need, and at what points in time.

Contextual Features

The past two decades have seen several viral outbreaks, including severe acute respiratory syndrome (SARS) in 2003, H1N1 influenza in 2009, Middle East respiratory syndrome (MERS) and Ebola in 2012, and now Covid-19. SARS, H1N1, and Covid-19 were classified as pandemics, with viruses spreading over multiple countries and impacting millions of people. Annually, viruses such as seasonal influenza result in 3–5 million cases of severe illness and a global mortality rate (GMR) of ∼0.1% (18). Whilst the 2009 H1N1 outbreak was more infectious, resulting in 60.8 million cases in the US alone, the GMR was much lower at 0.001–0.007%. In contrast, the SARS outbreak was more deadly, with a GMR of 11%, but less infectious with 8,098 people worldwide becoming ill. The majority of infections were hospital acquired (4, 19) with HCWs comprising many cases [37–63% in the most affected countries (20–22)].

In comparison, 17 months after the initial outbreak of Covid-19 in Wuhan, more than 137 million cases and 2.95 million associated deaths were confirmed globally (23) (13th April 2021). The vast majority of fatalities were people over the age of 70 or with underlying health conditions. As with SARS, many HCWs are amongst these numbers. In March 2020, WHO initially estimated the GMR to be 3.4% (24) but the true figure is unknown given that symptoms are mild to moderate in 80% of cases and, until recently, many countries were predominantly only testing people with symptoms. What figures do indicate is that Covid-19 is more deadly than seasonal influenza and H1N1, and more infectious than SARS. Many who contract Covid-19 are asymptomatic or symptoms take several days to appear, which means they could be infecting others without knowing it. This combination of features poses substantial challenges for managing the pandemic and places health systems and HCWs under extreme burden.

Pandemic Response

Pandemic response involves balancing ‘business as usual’ to minimize economic impact with measures such as social distancing and quarantining to minimize health impact (25). Modeling studies show the value of these measures for delaying the overall virus impact to allow time for antiviral drugs to be administered and appropriate vaccines developed (26, 27). Both social distancing and quarantining were implemented during the SARS outbreak but were mainly restricted to people displaying symptoms or coming into contact with those displaying symptoms, which predominantly meant HCWs (28). Social distancing was implemented more widely during the highly infectious H1N1 outbreak in Australia and parts of America for short periods of a few weeks (29, 30). In contrast, Covid-19 has instigated the largest, most impactful global pandemic response seen in the past 100 years. Social distancing has been widely enforced in many countries for several months, along with travel restrictions. More stringent measures such as “lock down” have been mandated across general populations in an attempt to slow the virus spread and avoid healthcare systems from becoming overwhelmed.

In the UK, the response has also been unique in terms of composition of HCWs responding to the threat. More than 20,000 retired HCWs have returned to the NHS to provide vital support at a critical time. They are potentially facing increased risks as Covid-19 mortality rates are much higher in those over the age of 60 (31). In addition, thousands of final year medical and nursing students stepped in to provide frontline support. Whilst they possess important medical knowledge and skills, these students have limited experience of working in crises, particularly of a prolonged, complex scale. The HCW population responding to Covid-19 is therefore more diverse than would ordinarily be the case, ranging from experienced retired HCWs in an increased risk age bracket, through to very recently qualifying HCWs with limited experience. This raises questions regarding the MH impact of responding to Covid-19 for HCWs.

Current Study

The current study provides a balanced assessment of what is currently known about the short- and long-term MH impact of pandemics on HCWs. We adopt a REA approach to address the need for timely evidence-based recommendations. Pooling data from across studies can identify links between key features and positive or negative MH outcomes, protective factors, and types of support needed, thereby identifying what interventions could benefit HCWs under the current pandemic and when. Such research is often conducted “as things happen” or retrospectively and so this REA will also assess evidence quality and implications for knowledge claims. This includes considering the extent to which data may be pooled given cross-cultural variation in a

---

Abbreviations: CHQ, Chinese Health Questionnaire; COPE, Coping Orientations to Problems Scale; DAS, Depression and Anxiety Scale; DSM, Diagnostic Statistical Manual; GAD, Generalized Anxiety Disorder Scale; GHQ, General Health Questionnaire; GMR, Global Mortality Rate; HCW, health care worker; IES-R, Impact of Events Scale-Revised; MERS, Middle East respiratory syndrome; MH, mental health; NHS, National Health Service; PHQ, Patient Health Questionnaire; PICO, population, interests, comparisons, outcomes; PPE, personal protective equipment; PTSD, post-traumatic stress syndrome; REA, rapid evidence assessment; SARS, severe acute respiratory syndrome; WHO, World Health Organization.

TABLE 1 | Inclusion and exclusion criteria used for the rapid evidence assessment.

Population	**Health care workers responding to pandemics, epidemics or protracted incidents**
Inclusion criteria	- Papers (peer reviewed academic journals) focused on health care workers in high and upper-middle income countries - Paper written in English - Only papers where the full-text version is readily available - Includes empirical data on a) mental health outcomes (e.g., observational/ prevalence) or b) economic costs attached to mental health outcomes
Exclusion criteria	- Focus on health care workers in low and lower-middle income counties - Not available in English - Full-text version is not readily available - No empirical data on mental health outcomes or economic modeling of mental health outcomes

range of issues. Review findings can be used by (a) researchers to provide a knowledge framework of issues that have emerged in past research and inform development of data proformas to improve comparability of evidence in future research; and (b) policy makers and service planners to provide an evidence-led brief about direction and evidence base for policy initiatives, clinical interventions or service programmes.

METHOD

An extensive search was conducted for studies published in peer-reviewed journals between January 2000 and May 2020 in order to include evidence emerging from the SARS outbreak in 2003. As the MH outcome of pandemics on HCWs is a multidisciplinary topic, the following databases were used: Cochrane Library, Discover, PsychInfo, PubMed, Science Direct, Scopus, and Google Scholar. In line with Varker et al.'s (31) general principles for conducting REA, we consulted with knowledge users from clinical and health settings to determine the scope of the research question, purpose, and search, inclusion and exclusion criteria (**Table 1**). The search strategy sequence was: (1) mental health outcomes* OR mental OR psychological OR health OR emotional OR social OR costs OR consequences; (2) health care workers* OR healthcare workers OR medical workers OR doctors OR physicians OR nurses OR paramedics; (3) pandemic* OR epidemic OR protracted incident.

Data extraction followed a two-stage selection process proposed by Varker et al. (31) to improve method transparency and standard of quality assessment, bringing REA more in line with guidelines (such as NICE) for providing summaries of the strengths and weaknesses of studies, applicability issues and other relevant contextual points. The first author carried out the initial screening of titles and abstracts against the predetermined inclusion/exclusion criteria. Where the relevance of the article was unclear, the full-text version was downloaded. The same reviewer read the full-text version and decided whether the paper should be included or excluded based on the pre-defined criteria (see **Figure 1**). Inter-rater reliability was conducted with another reviewer independently reading 50% of articles to assess whether they met the inclusion criteria, resulting in 95% agreement. Differences of opinion between the reviewers were resolved through discussion, resulting in 100% agreement. In total, 41 studies were identified as relevant to include in the REA.

A data extraction form was developed based on PRISMA guidelines (33). Studies were selected and appraised in respect of the Population, Interest, Comparisons and Outcomes (PICO) framework (34). Study quality was assessed using the STROBE checklist (35) and FORM framework (36) adapted by Varker et al. (37) for REA. Quality assessment was undertaken by the second author in consultation with the first author.

RESULTS

The majority of the 41 studies adopted a quantitative cross-sectional survey design to measure mental health outcomes but a range of different validated measures were used (see **Table 2** for details of study composition). In addition, 29 studies used questionnaires designed by authors to measure issues such as exposure to infected patients, coping strategies, training adequacy, perception of support, impacts on health, personal relationships and work life, disease knowledge, and risk acceptance. Details of how these scales were developed, the specific constructs they measured, or evidence of validation were often limited. Sampling frames ranged from all staff in one hospital to staff from across 34 hospitals. Some studies focused on doctors or nurses only whilst others included a variety of professionals such as paramedics, healthcare attendants, health administrators, pharmacists, physiotherapists, and psychiatrists. Traditional Chinese medicine practitioners, cleaners, food service providers, workmen and transport workers were also included in single studies. Only 13 studies involved an aspect of case-control and the nature of control groups varied from general population ($k = 2$) and traditional Chinese medicine practitioners ($k = 1$), to HCW's in lower risk work environments ($k = 8$), involuntarily conscripted to work in high-risk units ($k = 1$) and recovering from the virus ($k = 1$). Typical experience ranged from >2 to <33 years but many studies did not report details of experience, gender, age, or number of participants in each role.

Although we initially intended to conduct a meta-analysis on the data extracted from the 41 papers, this was not possible due to the wide variety of differences in measures used, mental health outcomes assessed, statistics used, populations, case controls, and time points over which data was collected (38). For example, the GHQ was the most commonly used measure ($k = 8$). Three of these studies were conducted in Singapore 2 months after the initial SARS outbreak, but with different samples (nurses and doctors vs. physiotherapists, occupational therapists and speech therapists vs. general practitioners and traditional Chinese medicine practitioners). One study was conducted in Canada at the peak of the SARS outbreak with healthcare professionals, nurses and doctors. Another was conducted in Hong Kong with nurses and healthcare assistants during the beginning of the post-SARS recovery period. One was conducted in Singapore 6

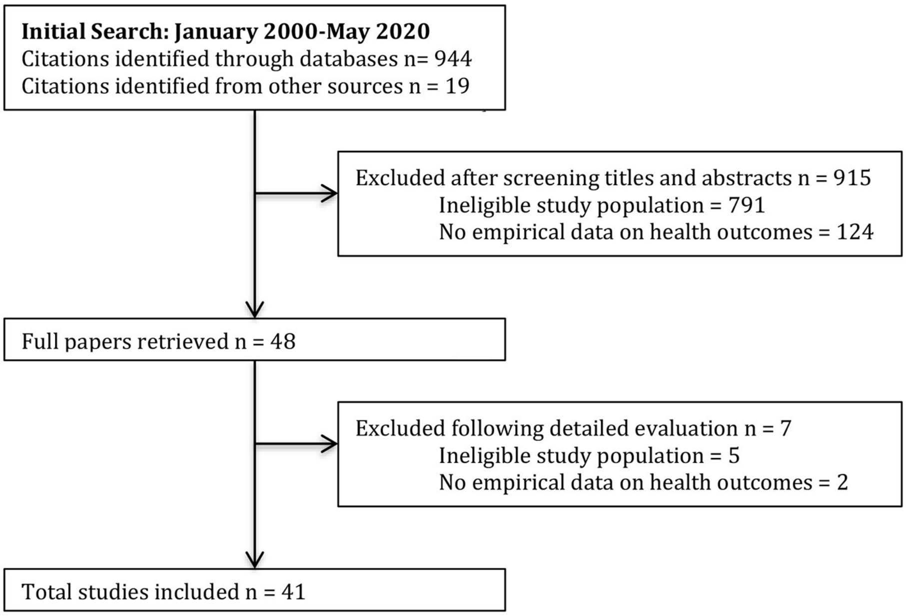


FIGURE 1 | Flow diagram of study selection adapted from "Preferred items for systematic reviews and meta-analyses: the PRISMA statement," by Moher et al. (32), PLoS Medicine, 6(7).

months post SARS recovery with nurses and doctors. Another study relating to H1N1 was conducted mid-outbreak in Greece with nurses, medical, allied health and auxiliary staff. A study relating to Covid-19 was conducted during the peak of the initial outbreak in China with nurses and doctors. All other measures were used in three or less studies, each of which examined different populations across different time periods. We have therefore conducted a narrative synthesis, using an interpretive approach to extrapolate meaning and understanding across studies (39, 40).

In the following section, findings are structured in relation to the following five recurring key themes that were present across studies: (i) timing of research; (ii) contact with patients; (iii) age and years of experience; (iv) gender; and (v) communication and confidence in training and equipment.

Timing of the Research

Studies varied in terms of whether they focused on short ($k = 31$) or longer-term ($k = 10$) MH outcomes. Short-term chronology of studies can be broken down into data collected during the initial phase of outbreak (i.e., first few weeks; $k = 1$), peak infection ($k = 14$), and recovery phase (i.e., no new cases recorded, or services start to return to normal; $k = 13$). Three studies did not provide details of when data was collected other than that it was during the outbreak. The 10 studies that focused on longer-term outcomes were conducted six (41, 42), eight (43), 12 (43, 44), 13–26 (45), 16–27 (46), 24 (47), 30 (48), and 36 months (49) after services began returning to normal. Only five studies examined outcomes at different time points, comparing initial with repair phases (5, 50), repair phase with 8 months later (43), and infection peak (44) or recovery phase (51) with 12 months later. Three studies drew samples from the same hospitals but not necessarily the same participants. Two studies used the same participants and made direct comparisons (50, 51).

Short-Term

Studies highlight associations between pandemics and increased stress (5, 6, 44, 52–57), emotional and psychological distress (5, 10, 33, 54, 57–62), burnout and exhaustion (60), anxiety (5, 9, 54, 56, 60, 61), post-traumatic stress and depressive affect (5, 54, 57, 61, 63–66). The majority of these studies were conducted in relation to the SARS outbreak but similar outcomes were identified across a range of countries, including Australia, Canada, China, Hong Kong, Singapore and Taiwan. Distress, and anxiety were also measured in relation to the H1N1 outbreak in Australia, Greece and Japan. Three studies published in relation to Covid-19 also highlight similar MH outcomes in China, including anxiety, distress, depression and insomnia (8, 54, 67).

In relation to stress, findings showed that HCWs experienced similar levels to members of the public during the SARS outbreak, but this was still much higher than for other significant life events such as unemployment and separation (53). HCWs attributed this elevated stress to the pandemic (52, 55), and were more likely to experience increased stress if they were married with children at home (6) or conscripted to work in a high-risk ward rather than volunteering (68). Those who were conscripted also reported more symptoms of intrusion, depression and psychoticism (68). HCWs families were also experiencing stress and roles and routines were affected, including partners taking on additional responsibilities such as shopping, school drop off and childcare (56). In one study, 74.2% of HCWs reported this

TABLE 2 | Composition of study population and data collection methods and measures used.

Incident	- 2003 SARS outbreak ($k = 34$) - 2009 H1N1 outbreak ($k = 4$) - Covid-19 ($k = 3$)
Country	- Canada ($k = 11$) - Asia ($k = 27$; Hong Kong = 8, Taiwan = 8, Singapore = 5, China = 5, Japan = 1) - Australia ($k = 2$) - Greece ($k = 1$)
Methods and measures	Quantitative ($k = 36$) - Psychiatric morbidity ○ General Health Questionnaire (GHQ 12 and 28; $k = 8$) ○ Chinese Health Questionnaire (CHQ; $k = 3$) ○ Symptom checklist-90 ($k = 2$), Center for epidemiologic studies depression scale ($k = 2$) ○ Zung's self-rating Anxiety Scale ($k = 2$) ○ Patient Health Questionnaire (PHQ; $k = 1$) ○ Generalized Anxiety Disorder Scale (GAD; $k = 1$) ○ Depression and Anxiety Scale (DAS; $k = 1$) ○ Beck depression inventory ($k = 1$), Zung's self-rating depression scale ($k = 1$) ○ Spellberg Trait Anxiety Inventory ($k = 1$) ○ Diagnostic Statistical Manual (DSM) clinical guidance ($k = 1$) - Stress ○ Perceived stress scale ($k = 2$) ○ Kessler psychological distress scale ($k = 2$) ○ State trait anger expression inventory ($k = 3$) - Post-traumatic stress symptoms ○ Impact of Events Scale (IES & IES-R; $k = 18$) ○ Davidson trauma scale-Chinese ($k = 2$) ○ Clinically administered PTSD scale ($k = 1$) - Coping strategies ○ Coping Orientations to Problems Scale (COPE; $k = 2$) ○ Chinese self-efficacy scale ($k = 1$). - Physical aspects (such as burnout, insomnia and disabilities) ○ Maslach burnout inventory ($k = 5$) ○ m Pittsburgh sleep quality index ($k = 2$) ○ Insomnia severity index ($k = 1$) ○ Sheehan's disability scale ($k = 1$). - Family background ○ Parental bonding instrument ($k = 2$) ○ Family APAGAR Index ($k = 1$) - Personality Eysenck's personality inventory ($k = 2$). - Eisenberger et al. Survey of perceived organizational support ($k = 1$) Qualitative ($k = 5$) - Combination of open-ended questionnaires, interviews, focus groups, and observations ($k = 4$) - Interviews only ($k = 1$)

increased stress was still negatively affecting family relationships as the pandemic moved into the repair phase (5).

Many HCWs also reported experiencing negative effects such as tiredness, health worries and fear of social contact (40, 52, 53, 63, 69, 70). Health worries about contracting and passing on SARS and H1N1 to family were repeatedly associated with stress, distress, anxiety and burnout (5, 6, 10, 33, 44, 53, 56, 59–61, 71, 72). Health worries were greater if HCWs had children at home (6, 10, 33, 56, 58), perceived themselves to be at increased risk of contracting the virus and becoming seriously ill (6, 25, 33, 44, 56, 57, 59, 60, 72), and knew or cared for fellow HCWs that had contracted the virus (56, 71). Studies also highlight that HCWs felt stigmatized by friends and neighbors and believed their family were stigmatized as a result of the job they did (6, 10, 25, 40, 56, 61, 71). Other substantial intrusive life impacts included staying away from home to minimize risk of infection (56, 60), changes in teaching, research, and ability to deliver patient treatment (10, 25, 60). For HCWs still living away from families during the repair phase, emotional distress was significantly more likely (5), with family support being identified as a protective factor against developing anxiety and depression (50). For HCWs who were quarantined, feeling socially isolated was also common (56), and was associated with increased psychological distress (63).

Findings from one study comparing outcomes across short-term phases showed that stress, anxiety, and worries about contracting and passing SARS on to family were higher during the initial response, whereas depression, post-traumatic stress and somatic symptoms were more likely during the recovery phase, as was considering resigning (5). One study conducted in Taiwan demonstrated the value of organizational interventions that focus on providing infection management training, detailed manpower allocation, adequate personal protective equipment (PPE) and access to MH teams for reducing anxiety and depression and improving sleep quality for nurses treating patients with SARS, both during peak response and recovery phases (50).

Long-Term

All longer-term studies focused on the SARS outbreak. Findings highlighted similar MH outcomes to short-term studies, including elevated stress (44, 51), psychological distress (45, 54, 73), burnout (41, 45), anxiety (44), state anger (41), post-traumatic stress and depression (42–44, 48, 49). Having a friend or relative that contracted the disease, being single, and having a low household income were associated with higher post-traumatic stress symptoms over two and a half years after the outbreak (48). Persisting health worries more than 6 months after the outbreak were associated with increased emotional exhaustion and state anger (41). Adaptive coping was identified as a protective factor against experiencing long-term post-traumatic stress, burnout and psychological distress (45). However, spending longer periods socially isolated in quarantine hindered adaptive coping (73), and increased risk of developing post-traumatic stress and depressive symptoms (40, 42, 48, 49) up to 3 years post-outbreak.

In the single study that compared short- and longer-term outcomes, stress levels were higher a year post-outbreak in HCWs at high risk of exposure to SARS but dropped in HCWs less likely to come into contact with infected patients (44). The authors suggest this may be the result of frustration at not receiving recognition for their contribution to the response, or anticipation of new virus outbreaks. Longer-term studies also focused on issues relating to productivity and secondary health problems, highlighting multiple adverse outcomes, including increased absence, reduced ability to maintain patient contact, and substance abuse (45).

Contact With Patients

A number of studies highlighted that working in departments at greater risk of coming into contact with and treating infected patients increased likelihood of developing a variety of difficulties compared with HCWs at low risk of coming into contact with infected patients. These high risk HCWs were significantly more likely to be concerned about contracting and spreading SARS to family members (6, 10, 41, 52, 67), which appears to be justified given that they were also more likely to be quarantined (25, 41). High risk HCWs were more likely to have changed living arrangements to minimize risks to family (10) and to experience greater difficulties in getting along with friends and family (55). They also reported feeling significantly more stigmatized (10), significantly greater negative responses, including fatigue, poor sleep, health worries, and fear of social contact (44, 66). Whilst high-risk HCWs noted feeling greater camaraderie with staff working and facing the situation together, some conflict was reported toward "non-essential" workers who remained at home and were paid (56).

High risk HCWs were also more likely to develop a range of MH problems. In the short-term, this included elevated stress (6, 57), distress (5, 10, 61), anxiety (5, 60, 61, 72), burnout and exhaustion (20, 41, 60, 73), state anger (41), post-traumatic stress (5, 20, 55, 63, 66), and depression (5). Being a nurse was linked with increased stress and distress in the short-term (33, 54, 60, 62) and post-traumatic stress symptoms 6 months post- outbreak (42) but this may relate to nurses having more direct contact with patients. Similar findings were recently observed in frontline HCWs responding to Covid-19 in Wuhan, the most affected region of China, who reported more severe depression, anxiety, distress and insomnia (54).

The level of contact HCWs had with infected patients continued to impact MH long-term, with stress (44), burnout, psychological distress, posttraumatic stress and depression (63) being significantly higher a year after the SARS outbreak for HCWs that were at high-risk of contact. Productivity was also more severely affected over a year post-pandemic including reduced patient contact and work hours, and increased substance use and days off work (45). Indeed, high risk HCWs were twice as likely to experience multiple problems than HCWs at low risk of coming into contact with infected patients (45). Whilst most of these studies were conducted in relation to the SARS outbreak, findings from across a number of countries demonstrate similar findings.

Age and Years of Experience

Seven studies highlighted the role of age or years of experience as a risk factor for MH difficulties. Four related to the 2003 SARS outbreak in China (49), Taiwan (5), and Hong Kong (57, 74), two to the 2009 H1N1 outbreak in Australia (5) and Japan (20), and one to the Covid-19 outbreak in China (72). In China, depressive symptoms were higher in younger HCWs 3 years post SARS outbreak (49). In Hong Kong, younger HCWs reported greater job-related stress (57) and negative impact on quality of life (74) during the SARS outbreak. In Taiwan, short-term distress was greatest in those with $<$ 2 years experience (5). In Japan and Australia, younger HCWs experienced significantly greater anxiety about contracting H1N1 (20, 58), causing some to refuse to care for patients (58). Recent findings in relation to Covid-19 also highlight increased anxiety and hostility in younger HCWs (72). However, a further six studies found no age differences in anxiety (8), distress (62), psychiatric morbidity (43, 51, 55), post-traumatic stress or depressive sympotoms (64, 75). A further study also report that experience had no significant impact on post-traumatic stress (6). Overall, study numbers are limited, each one focuses on different MH constructs, and a variety of measures are used, making it difficult to draw firm conclusions but there are some indications that having less healthcare experience may increase risk of short-term stress, distress, anxiety and long-term depression.

Gender

Six studies highlight gender differences in MH outcomes. In relation to the SARS pandemic, men reported experiencing greater emotional distress in the short-term in Taiwan (5) and short- and long-term stress in Hong Kong (44). In contrast, women were at increased risk of experiencing more severe symptoms of depression and anxiety in the short-term in relation to the SARS outbreak in Hong Kong (57), Taiwan (5), and the on-going Covid-19 response in China (54). Women were also significantly more worried about infecting family during the SARS outbreak (74). However, a further seven studies reported no gender differences in distress (10, 62), anxiety (8), psychiatric morbidity (51) or post-traumatic distress (6, 43, 55). Findings of these few studies are mixed but there are some indications that men may be more likely to experience stress and emotional distress, whereas women may be more likely to experience health worries, anxiety and depression. However, all of these studies focus on HCWs in Asian countries. Little is known about whether gender differences exist in western countries.

Communication and Confidence in Training and Equipment

During the highly infectious 2009 H1N1 outbreak, the supply of essential equipment and consumables was raised as a concern for health systems (9). As PPE supplies ran low, guidelines of what was considered appropriate and sufficient PPE changed (58). These inconsistencies in PPE protocol and issues with availability were associated with lower trust in protective measures and increased health worries about infection, both in relation to H1N1 (58) and SARS (10, 76). Lower trust in protective measures was also associated with increased stress (53, 76) and anxiety (60) in the short-term, and burnout, psychological distress, post-traumatic stress (45), state anger, and avoidant coping (73) in the long-term. Trust in protective measures appears to play an important role in short- and long-term MH outcomes for HCWs.

Findings also highlighted that public health bodies and HCWs' organizations played an important role in promoting trust in protective measures. Level of perceived access to transparent, trustworthy information regarding virus prognosis (59), protective measures and rationale for changing these measures (60), affected HCWs' levels of trust, stress and health worries. HCWs reported feeling angry about the spread of SARS and lack of or conflicting information given by management and public health bodies (56, 75). They reported experiencing stress and health worries as a result of seeing their children frightened and finding it difficult, in the absence of adequate support from public health bodies, to explain the situation without causing more fear, or to be confident about minimizing infection risks at home (56). There was also frustration that the spread of SARS could have been curtailed if HCW concerns had been heard and vigilant safety precautions quickly implemented (56). Perceived lack of organizational support continued to impact HCWs 6 months after recovery, leading to increased exhaustion and state anger (41). Providing adequate training and support served as protective factors against developing state anger (73), avoidant coping (45, 73), depression and post-traumatic stress (57, 77).

DISCUSSION

The purpose of this RAE was to provide a balanced assessment of what is currently known about the short- and long-term MH impact of pandemics on HCWs. Most studies included are best described as being discovery focused, conducted in naturalistic settings and drawing on unselected samples of HCW populations. The variation across studies precluded meaningful data pooling; rather this paper has provided a synthesis of meaningful themes that can guide decision making in the current pandemic. Applicability is promising as, despite evidence emerging from three different pandemics over a 17-year period, there is consistency in findings across a range of countries, including Australia, Canada, China, Greece, Hong Kong, Japan, Singapore, and Taiwan. Below, we discuss the findings of the REA, highlighting consistencies in the direction of results across studies. This is followed by a discussion of quality assessment, and finally implications and recommendations.

Mental Health Outcomes

Findings of this REA parallel a recent meta-analysis conducted by Kisely et al. (17), indicating that during peak pandemic response, HCWs experience increased stress, distress, anxiety and burnout. In addition, the current REA also focused on longer-term outcomes as services return to normal functioning with findings highlighting additional MH problems, including post-traumatic stress and depression. Several studies showed that risk of developing short- and long-term MH problems is associated with increased health worries, particularly if HCWs know or treat colleagues that are infected, have lower trust in protective measures and feel the information, training and support provided by public health bodies and their organization is inadequate. Whilst adaptive coping, social and family support serve as protective factors against developing MH problems, these are compromised when HCWs spend longer periods in quarantine. With over 850 UK HCWs losing their lives to COVID-19 to date, and concerns also repeatedly being raised about PPE, changing protective advice issued by public health bodies and adequacy of protective measure, it is likely that HCW health worries in relation to COVID-19 have been exacerbated.

Findings from across a number of countries also consistently demonstrate that working in departments that are likely to come into contact with patients infected with the virus increases risk of developing a range of short- and long-term MH difficulties. Similar findings are beginning to emerge in relation to Covid-19 in China (8, 54, 72), including three studies that have not been included in this RAE as they are under review for publication (3, 47, 67). A small number of studies also highlight gender differences in MH outcomes, with men more likely to experience stress and distress and women more likely to experience post-traumatic stress and depression. A small number of studies additionally show that less experienced HCWs are more likely to report distress. These findings should be viewed with caution due to differences in how constructs were operationalized and a small number of other studies reporting no significant gender or age differences. However, they do pose some tentative implications for the UK Covid-19 response as a large number of recently qualified HCWs are working on the frontline.

Overall, in reviewing the relevance of these broad findings to COVID-19, it is important to consider pandemic context. For example, Chong et al. (5) found a large proportion of HCWs were unwilling to risk caring for patients with SARS in the initial phase and considered resigning in the repair phase due to continued fear of infection. Compared to Covid-19, SARS was less infectious but had a higher GMR and the majority of HCWs in Chong et al.'s study believed they would have little chance of survival if infected. Researchers examining the impact of Covid-19 may not replicate findings about unwillingness to work, partly because of lower GMRs but also due to societal-wide government lockdown measures (to reduce rate of infection) and decisions to keep children of key workers in school settings (helping to alleviate practical concerns raised by HCWs in papers reviewed). The large-scale national and international responses may mean some early intervention points have been addressed. Notwithstanding this, similarities in pressure on health care persist (respiratory equipment, PPE, need to ensure safe working practices), which indicate that similar MH outcomes are likely to emerge from Covid-19.

Quality Assessment

The majority of studies used descriptive cross-sectional surveys, which is understandable given the unforeseen, often intense, risky and frenetic working conditions of HCWs during pandemics. Despite this, sample sizes were commendable, ranging from 47 to 10,511 for quantitative studies. Power and sample size calculations were not routinely undertaken but, with the exception of a few small-scale studies, the evidence base does not appear to suffer from underpowered studies. However, despite some authors recognizing the need for a high response rate so as to avoid under or overestimating the prevalence of psychiatric morbidity, internal validity was compromised by inability to make comparisons between respondents and non-respondents due to the need to maintain anonymity [one study provides a representativeness survey (45)]. Measurement of relationships between communication and confidence in protective measures and MH outcomes are subject to similar issues as it is not possible to know whether HCWs with poorer MH states or lower trust in protective measures were more likely to participate. Studies would benefit from a clearer understanding of baseline psychiatric morbidity measures for comparing pre- and post-pandemic measures. Whilst cohort studies are understandably challenging, other existing surveys could provide meaningful aggregate baselines (7). Explicit focus on pre-existing MH amongst respondents is needed to improve internal validity of findings. Whilst this might compromise anonymity, research collaborations with blind researchers and aggregate reporting methods could help to circumvent this problem.

Another issue that compromises this body of evidence is variations in study design, providing little in the way of systematic replication, nor standard statistical comparisons between subgroups of participants. Too many studies provide bespoke measures (sometimes where validated scales exist), and too little information is provided about how constructs were defined or operationalized. Sampling frames also vary considerably, and too little information is provided about sample characteristics in general. It would be difficult to replicate the sampling frame or study materials of some studies without consultation with authors. The timing of research further compromises comparison; MH outcomes are collected at different time points and the exact timing of research is not clear from a small number of studies. Overall, the most compelling evidence relates to high risk HCWs and, even here, definitional variation exists with some studies defining high risk as treating patients that are infected or working in high dependency units where there are likely to be patients that are infected, through to working in hospitals where there were cases of the disease.

It is also important to note the limitations of this REA. Despite conducting a broad search, we were unable to locate the full text in English for five studies that might have been relevant. Three only published the abstracts in English, and the other two did not have full texts available. In addition, three papers were also identified that provided evidence of the MH outcomes for HCWs in China responding to Covid-19 (8, 46, 72), which are likely to provide useful comparisons against the outcomes of previous pandemics. Yet they were not included in the current REA because the papers have not yet been reviewed and published, and so may be subject to further analysis and reporting changes in the final published versions. The REA also only identified a single paper that focused on a prevention programme that was implemented in Taiwan during the SARS pandemic, which demonstrated improved anxiety, depression, and sleep quality scores (50). Consequently, conclusions drawn about efficacy of pre-existing interventions that have been used during previous pandemics to improve MH outcomes for HCWs are limited.

Implications and Recommendations

Findings of this RAE provide a knowledge framework that can be used by researchers to inform future studies to assist HCWs in responding to pandemics. Observational studies are a vital part of responding to critical incidents and bio-disasters as they occur. Yet, the quality of observational studies could be much improved. The first recommendation is that authors make use of STROBE guidelines (22) to design their study. This would result in better descriptions of participants, thereby improving external validity; and methods thereby addressing problems with consistency and replicability. Questionnaires are particularly useful when lockdown procedures are in place. However, researchers are advised to use validated instruments where possible and be mindful of cross-validation with other instruments where it exists; for example, using GHQ (and measures with established concurrent validity such as CHQ, PHQ, GAD, and DAS). The IES-R might also be used (rather than IES) ideally 1 month after the initial phase so as to meet American Psychological Association guidelines around post-traumatic stress. Where cross-validation studies do not exist, it would be useful for researchers to undertake this work.

Whilst pandemics are unforeseen and uncontrollable, evidence from this review points toward similarities in constructs and research questions posed during three separate pandemics over a 17-year period, each involving respiratory disease. There have been similarities in concerns around PPE, quarantine and organizational communication that would have lent themselves to developing standardized and validated questionnaires. In reality, bespoke measures were used, and some authors provided too little information to aid replication. It would be useful for national research centers to work proactively to get ahead of this for the next potential pandemic. We recommend that national and international organizations (Chief Medical Officers, Centers for Public Health, WHO, CDC) develop a minimum data standard (or question bank) to capture organizational aspects and short- and long-term MH outcomes. This should include standardized measures to identify HCWs as "high-risk," guidance on population descriptors and how they might be applied internationally, response bias, suitable controls and concurrent validity. Relatedly, researchers need to consider the timing of research. A sensible framework suggested from the findings of the current review is the tripartite structure, initial phase of outbreak, peak of infection and recovery phase. Follow up time periods might then also become more standardized. Having national and international data standards and question banks would help researchers to conduct an observational study that is more directly comparable with that of others, thereby helping to improve the quality of the evidence base. A potential question bank might also be collated for other diseases, or at least be open enough to be useful, if the next pandemic is a non-respiratory disease.

The review also set out to identify target groups for treatment and intervention points and findings will benefit treatment providers as well as hospital managers and those in strategic roles. The first finding is that HCWs that are exposed to infected patients are more likely to experience short- and long-term MH outcomes and should be a treatment priority. Following from this, there are three key sub-groups. HCWs with children in the home may benefit from targeted psychological support to help them to cope with worries about infectivity. Longer periods of quarantine appeared to hinder adaptive coping for some HCWs and may be a particular sub-group in need of support to promote adaptive coping and minimize risks to MH. The third key sub-group may be those with existing MH problems. Existing MH was conspicuously absent from the majority of studies and evidence that did exist pointed toward HCWs with existing MH problems experiencing stress in the short term. These individuals may need additional support during the pandemic peak followed by close long-term monitoring.

The limited evidence emerging from this review around uptake and feedback on interventions somewhat challenges the view that high-risk HCWs require psychological intervention in the short-term. Uptake of counseling services were low in relation to SARS (57) and HCWs responding to Covid-19 in Wuhan (54, 78) have argued that psychological interventions competed with much needed rest breaks. A number of studies point toward a particular camaraderie amongst high-risk HCWs in a crisis; a psychological buffer that protects mental well-being as well as perhaps explaining the poor uptake of services. HCWs in Wuhan identified a number of practical issues they did need assistance with, such as training on how to respond to patients and visitors that did not want to follow quarantine procedures. This has led academics and researchers to respond directly to these requests (e.g., https://www.liverpool.ac.uk/project-ares/communication/). Whilst it is beyond the scope of this review to directly challenge HCWs' views, nor of MH professionals wishing to provide short-term interventions, lessons emerging from this review point toward the need for practical solutions (such as help with childcare). MH input should be voluntary, easily accessible and designed with HCWs' work schedules in mind (4). For example, voluntary short courses on resilience and adaptive coping could help to minimize risk of experiencing long-term post-traumatic stress, burnout and psychological distress for some HCWs.

Further key findings point toward the role of organizations in promoting adaptive coping in the short term. Findings indicate the importance of communication and organizational response during these early stages to improve short- and long-term MH outcomes. Of further use to hospital managers and those in strategic roles are resource implications. Findings highlight that capacity to respond is not only likely to be affected in the short-term (e.g., for those with flu like symptoms and in quarantine, those experiencing emotional exhaustion). Once the pandemic moves into the recovery phase there are likely to be additional adverse effects (reduced productivity and performance, sick leave related to PTSD and emotional exhaustion). These findings indicate a need for public health bodies to take steps to address shortfalls in staffing and productivity that are likely to continue months and years beyond an outbreak. A programme of psychological support for high-risk HCW workers would be beneficial during the repair phase. High-risk HCWs also report increased secondary health problems (including increased substance use) and at this point health psychology interventions might be proffered on a national basis. The lack of long-term follow up and variation in follow up period limits firm conclusions about the timing of such adverse effects but hospital managers should expect resource problems to occur 12 months post-pandemic. High-risk HCWs should be able to draw on voluntary sources of psychological support for at least 12 months following the peak of a pandemic, ideally longer for particularly high-risk HCWs.

CONCLUSION

This REA set out to synthesize knowledge from past pandemics to shed light on the potential impact of Covid-19 on HCWs. Forty-one studies were reviewed, the majority of which were discovery focused, conducted in naturalistic settings and drawing on unselected samples of HCW's populations. Although the variety in study designs, populations, measures and time periods precluded meaningful data pooling, we provided a narrative synthesis of themes that can guide decision making in the current pandemic. Target populations for intervention include high-risk HCWs with additional support needed for quarantined HCWs and those with children. Preliminary evidence indicates that the inexperienced student HCWs forming a strand of the UK response to Covid-19 may need additional short-term support. Short-term voluntary interventions focused on practical assistance, resilience and adaptive coping could help to minimize risk of experiencing long-term MH problems. Organizations play a key role as health worries are increased when HCWs have lower trust in protective measures and feel that information, training or support has been inadequate. Hospital managers and those in strategic roles should also anticipate long term resource problems as high-risk HCWs can experience depression and secondary health problems at least 12 months post pandemic. The role of pre-existing MH conditions is largely unknown, compromising internal validity, and suggesting an area of much needed research. Similarly, health care experience should form a more explicit focus of study designs. This is particularly pertinent in the UK due to the diverse HCW population responding to Covid-19. Researchers might consider differences in coping mechanisms between HCWs returning to the NHS, already working in the NHS, and newly qualifying HCWs.

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

SW and SG developed inclusion/exclusion criteria. SW conducted the literature search, selection of papers for inclusion, data extraction, narrative synthesis, wrote the introduction, methods, and results sections. SG conducted inter-rate reliability on papers for inclusion, quality assessment of papers, contributed to methods section write-up, and wrote the discussion. Both authors read and approved the final manuscript, and have agreed to be personally accountable for their own contributions and ensuring questions relating to accuracy or integrity of the work are appropriately investigated, resolved, and the resolution documented.

ACKNOWLEDGMENTS

The authors would like to thank Robert Morgan for his assistance in selecting studies for inclusion in the REA.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2021.629236/full#supplementary-material

REFERENCES

1. Considine J. Pandemic (H1N1) 2009 Influenza in Australia: Absenteeism and redeployment of emergency medicine and nursing staff. *Emerg Med Austr.* (2011) 23:615–23. doi: 10.1111/j.1742-6723.2011.01461.x
2. Hudson B, Toop L, Mangin D, Brunton C, Jennings L, Fletcher L. Pandemic influenza A(H1N1)pdm09: risk of infection in primary healthcare workers. *Br J Gene Practice.* (2013) 63:e416–22. doi: 10.3399/bjgp13X668212
3. Ip D, Lau E, Tam Y, So H, Cowling B, Kwok H. Increases in absenteeism among health care workers in Hong Kong during influenza epidemics, 2004–2009. *BMC Infect Dis.* (2015) 15:586. doi: 10.1186/s12879-015-1316-y
4. Lee VJ, Yap J, Cook AR, Chen MI, Tay JK, Barr I, et al. Effectiveness of public health measures in mitigating pandemic influenza spread: a prospective sero-epidemiological cohort study. *J Infect Dis.* (2010) 202:1319–26. doi: 10.1086/656480
5. Chong MY, Wang W, Hsieh W, Lee C, Chiu NM, Yeh WC, et al. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. *Br J Psychiatry.* (2004) 185:127–33. doi: 10.1192/bjp.185.2.127
6. Koh D, Lim MK, Chia SE, Ko SM, Qian F, Ng V, et al. Risk perception and impact of severe acute respiratory syndrome (SARS) on work and personal lives of healthcare workers in Singapore. What can we learn? *Med Care.* (2005) 43:676–82. doi: 10.1097/01.mlr.0000167181.36730.cc
7. Lee N, Hui D, Wu A, Chan P, Cameron P, Joynt M. et al. A major outbreak of severe acute respiratory syndrome in Hong Kong. *N Engl J Med.* (2003) 348:1986–94. doi: 10.1056/NEJMoa030685
8. Liu C, Yang Y, Zhang X, Xu X, Dou Q, Zhang W, et al. The prevalence and influencing factors in anxiety in medical workers fighting COVID-19 in China: a cross-sectional survey. *Epidemiol Infect.* (2020) 148:e98. doi: 10.1017/S0950268820001107
9. Dewar B, Barr I, Robinson P. Hospital capacity and management preparedness for pandemic influenza in Victoria. *Austr N Zeal J Public Health.* (2014) 38:184–90. doi: 10.1111/1753-6405.12170
10. Grace SL, Hershenfield K, Robertson E, Stewart DE. The occupational and psychosocial impact of SARS on academic physicians in three affected hospitals. *Psychosomatics.* (2005) 46:385–91. doi: 10.1176/appi.psy.46.5.385
11. Martin S. Nurses' ability and willingness to work during pandemic flu. *J Nursing Manage.* (2011) 19:98–108. doi: 10.1111/j.1365-2834.2010.01190.x
12. Masur H, Emanuel E, Lane HC. Severe acute respiratory syndrome: providing care in the face of uncertainty. *JAMA.* (2003) 289:2861–3. doi: 10.1001/jama.289.21.JED30036
13. Mitchell R, Ogunremi T, Astrakianakis G, Bryce E, Gervais R, Gravel D, et al. Impact of the 2009 influenza A (H1N1) pandemic on Canadian health care workers: A survey on vaccination, illness, absenteeism, and personal protective equipment. *Am J Infect Control.* (2012) 40:611–6. doi: 10.1016/j.ajic.2012.01.011
14. Ehrenstein BO, Hanses F, Salzberger B. Influenza pandemic and professional duty: Family or patients first? A survey of hospital employees. *BMC Public Health.* (2006) 6:311–3. doi: 10.1186/1471-2458-6-311
15. Huang L, Xu F, Liu H. Emotional responses ad coping strategies of nurses and nursing college students during COVID-19 outbreak. *MedRxiv.* (2020). doi: 10.1101/2020.03.05.20031898
16. Sim K, Chan YH, Chong PN, Chua HC, Soon SW. Psychosocial and coping responses within the community health care setting towards a national outbreak of an infectious disease. *J Psychosomat Res.* (2010) 68:195–202. doi: 10.1016/j.jpsychores.2009.04.004
17. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. *Br Med J.* (2020) 369:m1642. doi: 10.1136/bmj.m1642
18. WHO. *Fact Sheets: Influenza (Seasonal).* (2018). Available online at: https://www.who.int/news-room/factsheets/detail/ influenza-(seasonal) (accessed March 24, 2020).
19. Ruan YJ, Wei CL, Ee AL, Vega VB, Thoreau, Yun HSTS, et al. Comparative full-length genome sequence analysis of 14 SARS coronavirus isolates and common mutations associated with putative origins of infection. *Lancet.* (2003) 361:1779–85. doi: 10.1016/S0140-6736(03)13414-9
20. Matsuishi K, Kawazoe A, Imai H, Ito A, Mouri K, Kitamura N, et al. Psychological impact of the pandemic (H1N1) 2009 on general hospital workers in Kobe. *Psychiatry Clin Neurosci.* (2012) 66:353–60. doi: 10.1111/j.1440-1819.2012.02336.x
21. Twu SJ, Chen TJ, Chen CJ, Olsen SJ, Lee LT, Fisk T, et al. Control measures for severe acute respiratory syndrome (SARS) in Taiwan. *Emerg Infect Dis.* (2003) 9:718–20. doi: 10.3201/eid0906.030283
22. Varia M, Wilson S, Sarwal S, McGreer A, Gournis E, Galanis E, et al. Investigation of a nosocomical outbreak of severe acute respiratory syndrome (SARS) in Toronto, Canada. *CMAJ.* (2003) 169:285–92.
23. Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. *Lancet.* (2020) 20:533–4. doi: 10.1016/S1473-3099(20)30120-1
24. WHO. (2020). *WHO Director-General's Opening Remarks at the Media Briefing on COVID-19* – 3. (2020). Available online at: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-$-$3-march-2020 (accessed March 24, 2020).
25. Styra R, Hawryluck L, Robinson S, Kasapinovic S, Fones C, Gold WL. Impact on health care workers employed in high-risk areas during the Toronto SARS outbreak. *J Psychosomat Res.* (2008) 64:177–83. doi: 10.1016/j.jpsychores.2007.07.015
26. Kelso JK, Milne GJ, Kelly HA. Simulation suggestions that rapid activation of social distancing can arrest epidemic development due to a novel strain of influenza. *BMC Public Health.* (2009) 9:117. doi: 10.1186/1471-2458-9-117
27. Milne GJ, Kelso JK, Kelly, Huband HA ST, McVernon J. A small community model for the transmission of infectious diseases: comparison of school closure as an intervention in individual-based models of an influenza pandemic. *PLoS ONE.* (2008) 3:e4005. doi: 10.1371/journal.pone.0004005
28. DiGiovanni C, Conley J, Chiu D, Zaborski J. Factors influencing compliance with quarantine in Toronto during the 2003 SARS outbreak. *Biosecurity Bioterrorism.* (2005) 2:265–72. doi: 10.1089/bsp.2004.2.265
29. Hahné S, Donker T, Meijer A, Timen A, van Steenbergen J, Osterhaus A, et al. Epidemiology and control of influenza A(H1N1)v in the Netherlands: the first 115 cases. *Euro Surveill.* (2009) 14:19267. doi: 10.2807/ese.14.27.19267-en
30. Nishura H, Castillo-Chavez C, Safan M, Chowell G. Transmission potential of the new influenza A (H1N1) virus and its age-specificity in Japan. *Euro Surveill.* (2009) 14:19227. doi: 10.2807/ese.14.22.19227-en
31. Varker T, Forbes D, Dell L, Weston A, Merlin T, Hodson S, et al. Rapid evidence assessment: Increasing the transparency of an emerging methodology. *J Evalu Clin Pract.* (2015) 21:1199–204. doi: 10.1111/jep.12405
32. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med.* (2009) 6:e1000097. doi: 10.1371/journal.pmed.1000097
33. Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, et al. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care instruction. *Canad Med Assoc J.* (2004) 70:793–8. doi: 10.1503/cmaj.1031077
34. Falzon L, Davidson KW, Bruns D. Evidence searching for evidence-based psychology practice. *Profess Psychol Res Practice.* (2010) 41:550–7. doi: 10.1037/a0021352

35. Vandenbroucke JP, von Elm E, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *PLoS Med.* (2007) 4:e297. doi: 10.1371/journal.pmed.0040297
36. Hillier S, Grimmer-Somers K, Merlin T, Middleton P, Salisbury J, Tooher R, et al. FORM: an Australian method for formulating and grading recommendations in evidence-based clinical guidelines. *BMC Med Res Methodol.* (2011) 11:23. doi: 10.1186/1471-2288-11-23
37. Santos C, Bristow R, Vorenkamp J. Which Health care workers were most affected during the spring 2009 H1N1 pandemic? *Disaster Med Public Health Prepared.* (2010) 4:47–54. doi: 10.1017/S193578930000241X
38. Broome LJ, Izura C, Lorenzo-Dus N. A systematic review of fantasy driven vs. contact driven internet-initiated sexual offences: discrete or overlapping typologies? *Child Abuse Neglect.* (2018) 79:434–44. doi: 10.1016/j.chiabu.2018.02.021
39. Gough D, Thomas J, Oliver S. Clarifying differences between review designs and methods. *Syste Rev.* (2012) 1:28. doi: 10.1186/2046-4053-1-28
40. Harden A. Mixed-methods systematic reviews: Integrating quantitative and qualitative findings. *Focus.* (2010) 1–8. Available online at: https://ktdrr.org/ktlibrary/articles_pubs/ncddrwork/focus/focus25/Focus25.pdf
41. Fiksenbaum L, Marjanovic Z, Greenglass ER, Coffey S. Emotional exhaustion and state anger in nurses who worked during the SARS outbreak: the role of perceived threat and organizational support. *Canad J Commun Mental Health.* (2006) 25:89–103. doi: 10.7870/cjcmh-2006-0015
42. Phua DH, Tang HK, Tham KY. Coping responses of emergency physicians and nurses to the 2003 severe acute respiratory syndrome outbreak. *Acad Emerg Med.* (2004) 12:322–8. doi: 10.1111/j.1553-2712.2005.tb01951.x
43. Lu Y, Shu B, Chang Y, Lung F. The mental health of hospital workers dealing with severe acute respiratory syndrome. *Psychother Psychosomat.* (2006) 75:370–5. doi: 10.1159/000095443
44. McAlonana GM, Lee AM, Cheung V, Cheung C, Tsang KWT, Sham PC, et al. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Canad J Psychiatry.* (2007) 52:241–7. doi: 10.1177/070674370705200406
45. Maunder RG, Lancee WJ, Balderson K, Bennett JP, Borgundvaag B, Evans S, et al. Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. *Emerg Infect Dis.* (2006) 12:1924–32. doi: 10.3201/eid1212.060584
46. Lancee W, Maunder R, Goldbloom D. Prevalence of psychiatric disorders among Toronto hospital workers one to two years after the SARS outbreak. *Psychiatr Ser.* (2008) 59:91–5. doi: 10.1176/ps.2008.59.1.91
47. Dai Y, Hu G, Xiong H, Qui H, Yuan X. Psychological impact of the coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. *MedRxiv.* (2020). doi: 10.1101/2020.03.03.20030874
48. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *Canad J Psychiatry.* (2009) 54:302–11. doi: 10.1177/070674370905400504
49. Liu X, Kakade M, Fuller CJ, Fan B, Fang Y, Kong J, et al. Depression after exposure to stressful events: Lessons learned from the severe acute respiratory syndrome epidemic. *Comprehen Psychiatry.* (2012) 53:15–23. doi: 10.1016/j.comppsych.2011.02.003
50. Chen R, Chou K, Huang Y, Wang T, Liu S, Ho L. Effects of a SARS prevention programme in Taiwan on nursing staff's anxiety, depression and sleep quality: a longitudinal survey. *Int J Nursing Stud.* (2006) 43:215–25. doi: 10.1016/j.ijnurstu.2005.03.006
51. Lung F, Lu Y, Chang Y, Shu, B. Mental symptoms in different health professionals during the SARS attack: a follow up study. *Psychiatric Q.* (2009) 80:107–16. doi: 10.1007/s11126-009-9095-5
52. Chan SSC, Leung GM, Tiwari AFY, Salili F, Leung SSK, Wong DCN, et al. The impact of work-related risk on nurses during the SARS outbreak in Hong Kong. *Family Commun Health.* (2005) 28:274–87. doi: 10.1097/00003727-200507000-00008
53. Chua SE, Cheung V, Cheung C, McAlonan GM, Wong J, Cheung EPT, et al. Psychological effects of the SARS outbreak in Hong Kong on high-risk health care workers. *Canad J Psychiatry.* (2004) 49:391–3. doi: 10.1177/070674370404900609
54. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to Coronavirus disease 2019. *JAMA Network Open.* (2020) 3:1–12. doi: 10.1001/jamanetworkopen.2020.3976
55. Lin CY, Wu YH, Chang J, Chan CH, Yang DY. The psychological effect of severe acute respiratory syndrome on emergency department staff. *Emerg Med J.* (2007) 24:12–7. doi: 10.1136/emj.2006.035089
56. Robertson E, Hershenfield K, Grace SL, Stewart DE. The psychosocial effects of being quarantined following exposure to SARS: a qualitative study of Toronto healthcare workers. *Canad J Psychiatry.* (2004) 49:403–6. doi: 10.1177/070674370404900612
57. Tam CW, Pang EPF, Lam LCW, Chiu HFK. Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: Stress and psychological impact among frontline healthcare workers. *Psychol Med.* (2004) 34:1197–204. doi: 10.1017/S0033291704002247
58. Corley A, Hammond N, Fraser J. The experiences of health care workers employed in an Australian intensive care unit during the H1N1 Influenza pandemic of 2009: a phenomenological study. *Int J Nursing Stud.* (2010) 47:577–85. doi: 10.1016/j.ijnurstu.2009.11.015
59. Goulia P, Mantas C, Dimitroula D, Mantis D, Hyphantis T. General hospital staff worries, perceived sufficiency of information and associated psychological distress during the A/H1N1 influenza pandemic. *BMC Infect Dis.* (2010) 10:322. doi: 10.1186/1471-2334-10-322
60. Poon E, Liu KS, Cheong DL, Lee CK, Yam LYC, Tang WN. Impact of severe acute respiratory syndrome on anxiety levels of front-line health care workers. *Hong Kong Med J.* (2004) 10:325–30.
61. Verity R, Okell LC, Dorigatti I, Winskill P, Whittaker C, Imai N, et al. Estimates of the severity of coronavirus disease 2019: a model-based analysis. *Lancet: Infect Dis.* (2020) 20:669–77. doi: 10.1016/S1473-3099(20)30243-7
62. Wong TW, Yau JKY, Chan CLW, Kwong RSY, Ho SMY, Lau CC, et al. The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *Eur J Emerg Med.* (2005) 12:13–9. doi: 10.1097/00063110-200502000-00005
63. Maunder RG, Lancee WJ, Rourke S, Hunter JJ, Goldbloom, Balderson D K, et al. Factors associated with the psychological impact of severe acute respiratory syndrome on nurses and other hospital workers in Toronto. *Psychosomat Med.* (2004) 66:938–42. doi: 10.1097/01.psy.0000145673.84698.18
64. Sin SS, Huak CY. Psychological impact of the SARS outbreak on a Singaporean rehabilitation department. *Int J Ther Rehabil.* (2004) 11:417–24. doi: 10.12968/ijtr.2004.11.9.19589
65. Smith R, Keogh-Brown MR, Barnett T, Tait J. The economy-wide impact of pandemic influenza on the UK: a computable general equilibrium modelling experiment. *Br Med J.* (2009) 339:b4571. doi: 10.1136/bmj.b4571
66. Su T, Lien T, Yang C, Su YL, Wang, Tsai JS, et al. Prevalence of psychiatric morbidity and psychological adaptation of the nurses in a structured SARS caring unity during outbreak: a prospective and periodic assessment study in Taiwan. *J Psychiatr Res.* (2007) 41:119–30. doi: 10.1016/j.jpsychires.2005.12.006
67. Zhu Z, Xu S, Wang H, Liu Z, Wu J, Li G, et al. Covid-19 in Wuhan: Immediate psychological impact on 5062 health workers. *MedRxiv.* (2020). doi: 10.1101/2020.02.20.20025338
68. Chen C, Wu H, Yang P, Yen C. Psychological distress of nurses in Taiwan who worked during the outbreak of SARS. *Psychiatr Ser.* (2005) 56:76–9. doi: 10.1176/appi.ps.56.1.76
69. Ho SMY, Kwong-Lo RSY, Mak CWY, Wong JS. Fear of severe acute respiratory syndrome (SARS) among health care workers. *J Consult Clin Psychol.* (2005) 73:344–9. doi: 10.1037/0022-006X.73.2.344
70. Verma S, Mythily S, Chan YH, Deslypere JP, Teo EK, Chong SA. Post-SARS psychological morbidity and stigma among general practitioners and traditional Chinese medicine practitioners in Singapore. *Ann Acad Med.* (2004) 33:743–8.
71. Maunder R, Hunter J, Vincent L, Bennett J, Paladeau N, Leszkz M, et al. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Canad Med Assoc J.* (2003) 168:1245–51.

72. Xing J, Sun N, Xu J, Geng S, Li Y. Study of the mental health status of medical personnel dealing with new coronavirus pneumonia. *PLoS ONE.* (2020) 15:e0233145. doi: 10.1371/journal.pone.0233145
73. Marjanovic Z, Greenglass ER, Coffey S. The relevance of psychosocial variables and working conditions in predicting nurses' coping strategies during the SARA crisis: an online questionnaire survey. *Int J Nursing Stud.* (2007) 44:991–8. doi: 10.1016/j.ijnurstu.2006.02.012
74. Wong WCW, Lee A, Tsang KK, Wong SYS. How did general practitioners protect themselves, their family, and staff during the SARS epidemic in Hong Kong? *J Epidemiol Commun Health.* (2004) 58:180–5. doi: 10.1136/jech.2003.015594
75. Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styra R. SARS control and psychological effects of quarantine, Toronto, Canada. *Emerg Infect Dis.* (2004) 10:1206–12. doi: 10.3201/eid1007.030703
76. Lee S, Juang Y, Su Y, Lee H, Lin Y, Chao C. Facing SARS: psychological impacts on SARS team nurses and psychiatric services in a Taiwan general hospital. *Gene Hospital Psychiatry.* (2005) 27:352–8. doi: 10.1016/j.genhosppsych.2005.04.007
77. Chan AOM, Huak CY. Psychological impact of the 2003 respiratory syndrome outbreak on health care workers in a medium size regional general hospital in Singapore. *Occupat Med.* (2004) 54:190–6. doi: 10.1093/occmed/kqh027
78. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, et al. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry.* (2020) 7:E15–6. doi: 10.1016/S2215-0366(20)30078-X

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 26 May 2021
doi: 10.3389/fpsyt.2021.619128

Adverse Childhood Experiences and Mindfulness in Chinese College Students During the COVID-19 Pandemic

Chienchung Huang[1], Meifen Yang[2]*, Yun Geng[3], Yafan Chen[1], Shannon P. Cheung[1], Guosheng Deng[4], Qiang Dong[5], Hongwei Hu[6], Kai Hua[7], Jinyu Liao[3], Yuanfa Tan[8], Bin Tu[2], Enjian Wang[9], Zhihong Yu[10], Congcong Zhang[11], Shuyan Zhang[12] and Gaosheng Zhuo[13]

[1] School of Social Work, Rutgers, The State University of New Jersey, New Brunswick, NJ, United States, [2] School of Public Administration, Guangdong University of Foreign Studies, Guangzhou, China, [3] School of Government, Central University of Finance and Economics, Beijing, China, [4] School of Public Policy & Management, Tsinghua University, Beijing, China, [5] College of Humanities and Development Studies, China Agricultural University, Beijing, China, [6] School of Public Administration and Policy, Renmin University of China, Beijing, China, [7] Soccer Academy, Wuhan Sports University, Wuhan, China, [8] Research Institute of Social Development, Southwestern University of Finance and Economics, Chengdu, China, [9] School of Humanities and Social Sciences, North China Electric Power University, Beijing, China, [10] School of Sociology, Wuhan University, Wuhan, China, [11] Department of Youth Work Research, China Youth University of Political Studies, Beijing, China, [12] School of International and Public Affairs, Jilin University, Changchun, China, [13] Institute of Social Development, Wenzhou University, Wenzhou, China

OPEN ACCESS

Edited by:
*Ghayda Hassan,
Université du Québec à Montréal, Canada*

Reviewed by:
*Matthew Richard Capriotti,
San Jose State University, United States
Hannah E. Frank,
Brown University, United States*

***Correspondence:**
*Meifen Yang
mfyang2019@163.com*

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: 19 October 2020
Accepted: 03 May 2021
Published: 26 May 2021

Citation:
Huang C, Yang M, Geng Y, Chen Y, Cheung SP, Deng G, Dong Q, Hu H, Hua K, Liao J, Tan Y, Tu B, Wang E, Yu Z, Zhang C, Zhang S and Zhuo G (2021) Adverse Childhood Experiences and Mindfulness in Chinese College Students During the COVID-19 Pandemic. Front. Psychiatry 12:619128. doi: 10.3389/fpsyt.2021.619128

Mindfulness has been found to have many positive effects on life outcomes, including mental health and educational achievement. However, less is known about the antecedents of mindfulness, particularly in Chinese college students. This study examines the effect of adverse childhood experiences (ACEs) on mindfulness among Chinese college students in September 2020, during the COVID-19 pandemic. We hypothesized that ACEs negatively affected students' mindfulness. The data were collected from 1,871 college students from 12 colleges across China. The results aligned with our hypothesis that ACEs was negatively associated with mindfulness. In particular, emotional abuse and neglect in childhood appear to have the most negative effects on mindfulness compared to other dimensions of ACEs such as physical abuse and household challenges.

Keywords: mindfulness, China, adverse childhood experiences, college, pandemic

INTRODUCTION

Mindfulness is a state of consciousness that incorporates purposeful awareness and attention, as well as non-judgmental reactions, to the present moment (1). It has two key components, mindful attention and mindful metacognition (2–4). Mindfulness starts with bringing awareness to the present moment by regulating attention, which makes individuals alert to what is occurring in the here-and-now. Mindful metacognition refers to detachment from the monitoring of thoughts and feelings about the ongoing events. Such detachment requires individuals to step back mentally, rather than getting involved and judging their thoughts and feelings. These components, mindful attention and mindful metacognition, have been shown to be highly correlated with one another ($r = 0.44, p < 0.001$) (4). Empirical studies have found that mindfulness increases students' social and emotional competence (5, 6) and academic performance (7, 8), while reducing behavioral problems (9, 10). Although extensive evidence has shown that mindfulness has positive effects on life outcomes, the antecedents of mindfulness are relatively understudied (4, 8). Given that mindfulness is associated with positive outcomes, it is imperative to identify its antecedents so that we can detect high-risk groups with low levels of mindfulness and provide necessary support and services to them.

Mindfulness relies on a capacity to self-regulate attention and the interplay of three motivational forces that drive cognitive resources into or away from self-regulation. The three motivational forces include "metacognitive beliefs that drive resources into self-regulation, mental fatigue that draws resources away from self-regulation, and situational appraisals that influence how much self-regulation is needed to maintain mindfulness" [(4), p. 79]. Using three different samples of college students, hospital nurses, and full-time workers in the community, Reina and Kudesia (4) found that participants' capacity to self-regulate and their metacognitive beliefs were positively related to mindfulness. By contrast, mental fatigue and situational stressors were negatively associated with mindfulness.

Adverse childhood experiences (ACEs) are negative events that occur before a person reaches 18 years of age. These events may include abuse (i.e., psychological, physical, or sexual), neglect, household challenges (i.e., violence perpetrated against mother; cohabitation with individuals who use substances, have mental illness, or have been incarcerated) (11). These events typically have harmful after-effects and may even be conceptualized as traumatic (11). ACEs have been shown to be associated with poorer functioning related to mental health, somatic disturbances, substance abuse, impaired memory, early sexuality, perceived stress, anger control, and risk of intimate partner violence (12–14). For example, Anda et al. (12) conducted a study on 17,337 adults and found that higher ACE score significantly increased the risks of the affective, somatic, substance abuse, memory, sexual, and aggression-related outcomes. Moreover, the mean number of comorbid outcomes tripled across the range of ACE scores (12). Likewise, Merrick et al. (13) investigated ACEs in 25 states between 2015 and 2017 and found that about one in six adults experienced four or more types of ACEs. ACEs were significantly associated with worse health outcomes, greater health risk behaviors, and greater socioeconomic challenges. Thus, it is likely that ACEs reduce self-regulation capacity and metacognitive beliefs while increasing the likelihood of mental fatigue, all of which lead to reductions in degree of mindfulness. Given that ACEs have significant detrimental effects on individual development, it is critical to investigate the extent to which ACEs may affect mindfulness.

The conceptual framework of this study utilizes Herman's (15) trauma theory, which posits that traumatic experiences, including those events considered ACEs, can cause considerable harm to individual well-being. The effects of trauma impose negative consequences to both "psychological structures of the self" and "the systems of attachment and meaning that link individual and community" [(15), Chapter 3, para. 2]. Underlying the presentation of trauma symptom clusters are the traumatized individuals' fractured belief systems surrounding trust and safety in the world (15). These three symptom clusters, which are often characteristic of clinical posttraumatic stress disorder (PTSD), are termed hyperarousal, constriction, and intrusion.

A key symptom of PTSD, hyperarousal is the overactivation of the sympathetic nervous system in response to a traumatic memory. Individuals experiencing chronic hyperarousal may live in an extended state of self-protective vigilance. Affected individuals may find it difficult to regulate this hyperarousal. Often, to counter this, individuals may experience numbing, or constriction. This leads individuals to remain physiologically, emotionally, and cognitively unresponsive to stimuli. Although constriction may be conceptualized as having a protective function by helping individuals avoid trauma responses, the experience of intrusion symptoms causes a sudden and intense reliving of the traumatic event: disjointed images and graphic sensations of the original experience, typically in the form of nightmares, can disrupt constriction.

Traumatic events may overwhelm individuals by causing severe disruptions to their core beliefs regarding safety and trust. This subsequently leaves them feeling powerless and disconnected; some even feel as though they have lost all meaning in life. In response to extreme trauma, individuals become hypersensitive to potential danger and/or dissociative, reducing their capacity to maintain a state of mindfulness (15, 16). In fact, previous mindfulness literature has identified that the areas of the brain associated with mindfulness are responsible for basic functions such as body regulation, conditioned fear modulation, and emotional balancing, among others (17). These few functions, however, are heavily dysregulated in individuals who exhibit posttraumatic stress symptoms. Regulating the conditioned fear response, what Forner (17) refers to as "updating our files," allows individuals to differentiate and distinguish a stimulus that was once a valid fear but is now no longer a threat. For example, two feet of water may appear scary and life-threatening to a toddler but less so to an adult (17). Hypervigilance indicates this inability to regulate the conditioned fear response, leaving an individual in a state of heightened alertness and unable to remain non-judgmental (15). On the other side of the spectrum of trauma responses, constriction or numbing similarly indicates a "shutting down" of the body, whereby an individual may be taken out of the present moment to avoid potentially triggering stimuli and unable to engage in mindfulness (16). Whether an individual tends to experience hypervigilance, constriction, or a combination of both, these symptom clusters appear to affect the same functions that are performed by the areas of the brain associated with mindfulness, indicating a potential negative relation between trauma and mindfulness.

Empirical evidence indicates that ACEs are negatively associated with mindfulness; this is true across applications of various mindfulness measurement instruments (16, 18, 19). Emirtekin et al. (18) found that adolescents' dispositional mindfulness—defined as open and receptive awareness of and attention to the present moment and measured by the Mindful Attention Awareness Scale (MAAS)—has a significant negative correlation with childhood emotional abuse ($N = 470$; $r = -0.46$; $p < 0.001$). In another study by Nagel et al. (19), there was a significant negative association ($p < 0.001$) between ACEs and dispositional mindfulness, measured by the Revised Cognitive and Affective Mindfulness Scale (CAMS-R). The CAMS-R measures dispositional mindfulness on a scale of 12 to 48. In Nagel's et al. (19) study of over 700 adult patients, those without ACEs had an average CAMS-R score of 35.2, while those with 3 or more ACEs had a significantly lower average score of 32.5. Last, using the Revised Mindfulness Self-Efficacy Scale (MSES-R) to measure facets such as emotion regulation, equanimity, and distress tolerance, Voith et al. (16) reported that ACEs were negatively correlated with mindfulness self-efficacy ($r = -0.41$) in a sample of approximately 70 men of color.

While the extant literature has provided substantial evidence of the relation between ACEs and mindfulness, most studies are situated in the context of Western countries. The findings of these studies, therefore, may not necessarily be generalizable to those living outside of Western countries and cultures. In particular, Chinese society has not adequately perceived ACEs, such as exposure to domestic violence, as threats to child and youth development (20, 21). It is imperative to investigate whether ACEs affect Chinese as they did in Western samples. Given the lack of studies on ACEs and mindfulness in non-Western contexts, along with scholarship pointing to the importance of the college years to adult well-being (22–26), the primary aim of this study is to examine the effects of ACEs on mindfulness in a Chinese college student sample.

METHODS

Data and Sample

The data for the present study came from an online anonymous survey administered to junior and senior students in 12 universities across China. We purposely selected universities from the north, east, south, west and middle regions of China to compile a representative sample. Once universities were selected, we contacted each university's department of social science and invited junior and senior students to participate in the online survey. A total of 2,229 students were invited for the survey in late September 2020. Reminders to participate in the survey were sent to students 3 and 7 days after the initial invitation. One thousand, eight hundred eighty-one students participated in the online survey by early October 2020. Ten surveys had incomplete answers and were excluded from the final analysis. Our final analytic sample contained data from 1,871 students, indicating a response rate of 80%. The research protocol was approved by the research review committee at one of the co-authors' University in China. An informed consent process was implemented prior to the survey. An incentive of 10 RMB for participation (2 USD) was provided. Students were informed that their participation was voluntary and that they could choose to stop completing the survey at any time.

Measures

The dependent variable, *mindfulness*, was assessed by the 15-item Mindful Attention Awareness Scale (MAAS) (27). Past studies have shown that the Chinese version of MAAS is both valid and reliable for use with Chinese populations (9, 28). The 15 items asked participants to identify the frequency at which they experience feelings, behaviors, or mindful thoughts over the past 4 weeks. Examples of items include: "I rush through activities without being really attentive to them;" "I find myself doing things without paying attention;" and "I break or spill things because of carelessness, not paying attention, or thinking of something else." The score for each item ranges from 1 to 6 (almost never to almost always). We reversed the scores so that higher scores indicated higher levels of mindfulness. The total of all scores provided ranged from 14 to 90, and the Cronbach's alpha of MAAS was 0.90 in this study.

The key independent variable, *adverse childhood experiences*, was measured by the Adverse Childhood Experience scale (ACE) and assessed adverse childhood experiences during the respondent's first 18 years of life (11). Ten items were used to measure ACEs across three dimensions: abuse (3 items), neglect (2 items), and household challenges (5 items). Example questions included "Did a parent or other adult in the household often: swear at you, insult you, put you down, or humiliate you?," "Did you often feel that: No one in your family loved you or thought you were important or special?," and "Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?" Each affirmative answer was assigned one point. The questions were translated into Chinese by two Chinese doctoral students in the United States and verified by an American professor whose native language is Chinese. While the psychometrics of the Chinese language version of the ACE scale are not well-established, it has been used in previous studies (29, 30). The sum of all affirmative answers represents the ACE score. A higher score indicates a higher frequency of experiencing adverse events in the first 18 years of life. In addition, we calculate the scores of three dimensions in ACE scale, as well as the percentages of each and the total ACE events. The Cronbach's alpha of this scale was 0.69 in this study.

Students' demographic characteristics acted as controls in this study since previous studies have shown that they may affect ACEs and mindfulness (9, 16, 19, 30). These characteristics include age, gender (0 = male; 1 = female), ethnicity (1 = Han; 0 = other), household registration (rural, city with prior rural registration, city), parents' marital status (married, separated, divorced, and widowed), and highest educational background (elementary school or below, middle school, high school, and some college or above), number of family members, and annual family income and welfare status (0 = no; 1 = yes) in the last year. Given that the survey was conducted during the COVID-19 pandemic, we also controlled for COVID-19 experiences, which were measured by asking students whether their family members or friends had tested positive or died of COVID-19. Finally, since we sampled students from 12 colleges across China, different college characteristics may affect mindfulness of students as well. We thus take college into account by controlling for specific college characteristics, or college-fixed effect.

Analytic Strategies

Descriptive analysis was performed to examine the distribution of each main variable. Next, to estimate the net effect of ACEs on mindfulness, we conducted multivariate regression analyses while controlling for socioeconomic characteristics of the students. The framework underlying this study posits that the degree of college students' mindfulness is determined by their ACEs as suggested by Herman's trauma theory (15), demographic characteristics, and college-level characteristics.

TABLE 1 | Level of mindfulness and adverse childhood experience.

	Mean (S.D.) or *n* (%)
Mindfulness (15–90)	59.61 (10.84)
Adverse Childhood Experience [*n*, %]	658, 35%
Adverse Childhood Experience [0–10]	0.69 (1.28)
Abuse [0–3]	0.28 (0.63)
Emotional abuse [*n*, %]	201, 11%
Physical abuse [*n*, %]	116, 6%
Sexual abuse [*n*, %]	213, 11%
Neglect [0–2]	0.15 (0.41)
Emotional neglect [*n*, %]	233, 12%
Physical neglect [*n*, %]	51, 3%
Household Challenge [0–5]	0.26 (0.61)
Parental separation or divorce [*n*, %]	264, 14%
Mother treated violently [*n*, %]	42, 2%
Substance abuse in the household [*n*, %]	37, 2%
Mental illness in the household [*n*, %]	88, 5%
Incarcerated household member [*n*, %]	51, 3%

N = 1,871.

The specification of the analytic model is represented by the following equation:

$$Y_i = \alpha_i + \beta_1 * \chi_i + C_i + \varepsilon_i,$$

where Y i is mindfulness of the subject i; αi is the individual constant; χ is a vector of ACE and socioeconomic characteristics of subject i; Ci is the college for subject i, or college-fixed effect (which is taken to be constant across individual colleges); β is a vector of regression coefficients; and εi is the cross-section error component. Note that with college-fixed effect, the model controls for differences across colleges. Ordinary least squares (OLS) regression was used for the analyses. We conducted the regression analyses in several steps. First, to account for past literature indicating that both the occurrence of ACEs and number of ACEs may have different effects on mindfulness (16, 19), we examined how each specification may affect mindfulness in our sample. We compared the models' adjusted *R*-square values to determine which specification fit the data better and utilized the selected specification to conduct robustness tests with the ACE subscales and individual ACE items as independent variables. Given multiple regression analyses of different ACE specifications were performed, the Bonferroni test was used to control for multiple testing. The Bonferroni-adjusted *p*-value, calculated by multiplying the observed *p*-value by the number of tests performed, was used. STATA software 16.0 was used for all analyses.

RESULTS

Descriptive Statistics

Table 1 presents the descriptive statistics of mindfulness and ACE. The sampled students had an average mindfulness score of 59.6. Scores ranged 15 to 90 and had a standard deviation of 10.8. About 35% of students (n=658) reported that they experienced at least one type of ACE in childhood. ACE scores in the sample ranged 0 to 10 with a mean of 0.69 (*SD* = 1.28). In our study, average ACE subscale scores were 0.28 (*SD* = 0.63) for abuse, 0.15 (*SD* = 0.41) for neglect, and 0.26 (*SD* = 0.61) for household challenges. With regards to individual ACE experiences, 14% of the sample reported parental separation or divorce. Other individual ACE experiences that the sample answered affirmatively at a high rate were emotional neglect (12%), emotional and sexual abuse (both at 11%), physical abuse (6%), and mental illness in the household (5%). The percentages of students reporting physical neglect, incarcerated household member, substance abuse in the household, and mother treated violently were low, all at 3% or below. **Table 2** presents socioeconomic characteristics of the students. Less than 1% of students reported that they had family members or friends infected with COVID-19 (0.5%) or died (0.4%) of COVID-19. Due to low occurrence, we combined both infected and died into one category for regression analysis. Regarding the college composition, no college occupied the final sample more than 12%, ranged from 2.5 to 11.5%, reflecting the size of students in their social science departments.

Multivariate Analyses

Table 3 presents the standardized coefficients of mindfulness, estimated by OLS regression. Two models are presented. The first one modeled ACE as an occurrence variable [yes = 1, no = 0], while the second one used observed ACE score in the analysis. The occurrence of ACE had a significant and negative effect on mindfulness in Model 1. Students with ACE experience reported 0.16 standard deviation less mindfulness than students without ACE experience. In addition, age, parental marital status, and COVID-19 infection had significant effects, while HR and parental education had marginal effects, on mindfulness of students. Overall, level of mindfulness increased with age. Students whose parents were married had 0.05 standard deviation less mindfulness than their counterparts. Students who had family members or friends infected by COVID-19 also showed significantly lower mindfulness, by 0.09 standard deviation, than their counterparts. Mindfulness was also positively associated with city HR and students whose parents had college education or above. The adjusted *R*-square of Model 1 was 0.06. The adjusted *R*-square increased to 0.08 in Model 2. Model 2 showed that ACE score had a significant and negative effect on mindfulness. A one standard deviation increase in the ACE score was associated with a 0.21 standard deviation reduction in mindfulness. The rest of the results of Model 2 were similar to those reported in Model 1.

Given that Model 2 has a higher adjusted R-square, we conducted the same regression analyses for the three ACE subscales and individual ACE items. The robustness tests of ACE subscales and items on mindfulness are presented in **Table 4**. Each entry in **Table 4** represents a different multivariate regression analysis with the same controls listed in Model 2 of **Table 3**. For simplicity, we only present the results for the ACE items in **Table 4**. The results for other variables were similar to those reported in **Table 3**. Each of the ACE subscales

TABLE 2 | Descriptive statistics of socioeconomic variables.

	Mean (S.D.) or *n* (%)
Gender [%]	
Female	66.97
Male	33.03
Age	20.62 (0.96)
Household registration [%]	
Rural	38.70
City, rural before	8.93
City	52.37
Grade [%]	
Junior	60.72
Senior	39.28
Ethnicity [%]	
Han	89.36
Others	10.64
Parent marital status [%]	
Married	89.04
Separated	0.80
Divorced	6.89
Widowed	2.35
Others	0.91
Parent highest education achievement [%]	
Elementary school and below	6.90
Junior high school	28.11
High school	25.17
College and above	39.82
Family income	90,990 (122,030)
Welfare status	
No	74.72
Yes	25.28
Number of family members	3.87 (1.16)
COVID-19 Infection in family and friends [%]	
No	99.14
Infected	0.48
Dead	0.37
College [%]	
College 1	7.11
College 2	9.57
College 3	6.25
College 4	10.85
College 5	10.15
College 6	7.06
College 7	6.41
College 8	11.54
College 9	11.12
College 10	2.46
College 11	6.89
College 12	10.58

N = 1,871.

had a significant negative relationship with mindfulness, with the strongest effects from abuse ($\beta = -0.17$), followed by neglect ($\beta = -0.16$) and household challenge ($\beta = -0.13$). As for the individual ACE items, all items were associated with lower levels of mindfulness. Emotional abuse and neglect had the strongest effects on mindfulness ($\beta = -0.16$ for both), followed by physical and sexual abuse, and substance abuse in the household ($\beta = -0.11$ for all), physical neglect and mental illness in the household ($\beta = -0.09$), and mother treated violently ($\beta = -0.07$).

DISCUSSION

The findings of this study showed that the average mindfulness score (59.6) in our sample was lower than those of Chinese college students in previous studies (28, 31). Tan's et al. (31) sample of 508 Chinese college students had an average mindfulness score of 61.2 (*SD* = 11.1). Deng et al. (28) surveyed 263 students at Dalian University of Technology, China, and found an average mindfulness score of 63.6 (*SD* = 11.1). However, it is not clear whether the difference between our sample and others was due to COVID-19, timing, or sample composition. Future studies that use longitudinal research design to follow students over the course of the pandemic should be able to distinguish the changes of mindfulness before, during, and after the pandemic.

The mean ACE score in our sample was 0.69, which is lower than average ACE scores found in previous studies (29, 30). Notably, our sample and measures are not exactly comparable to previous studies. Zhang et al. (30) used rural high school graduates (*N* = 1,019) from 3 provinces in China and found that three-fourths of the sample reported at least one ACE. The sample averaged 1.6 ACEs (*SD* = 1.5). A systematic review of 32 studies on childhood maltreatment among Chinese college students found that 64.7% of students reported experiencing at least one form of childhood maltreatment (29). The extent to which low ACE prevalence in our sample was a result of sample differences or social desirability bias is unclear. Notably, our sample had a relatively higher socioeconomic background than other study samples. This warrants further investigation in future studies.

The findings from the regression analyses support trauma theory (15) and indicate modest effects of ACEs on students' mindfulness during the pandemic. Increasing the ACE score by one standard deviation was associated with a reduction of 0.21 standard deviations in mindfulness. In the ACE subscale analysis, all three subscales showed significant negative effects on mindfulness, with the strongest effect from abuse, followed by neglect and household challenges. In the ACE scale individual item analysis, emotional abuse, and neglect had the strongest effects on mindfulness, followed by physical and sexual abuse, and substance abuse in the household. The results indicate a modest influence of ACEs on the level of mindfulness for college students in China, particularly those students who report experiencing emotional abuse and neglect in the childhood.

Concerning the critical effects of ACEs on mindfulness, as well as other outcomes, researchers and practitioners should concentrate efforts into ACE prevention and protection as strategies to advance individuals' mindfulness and other life

TABLE 3 | Multivariate regression analysis of mindfulness.

	Model 1			Model 2		
	Beta	**S. E.**	***P***	**Beta**	**S. E.**	***P***
Adverse childhood experience [%]	−0.16	0.04	***	–	–	
Adverse childhood experience [Score]	–	–		−0.21	0.01	***
Female	0.00	0.04		0.00	0.04	
Age	0.06	0.02	*	0.06	0.02	*
Household registration: City, rural before	0.00	0.06		0.01	0.06	
Household registration: City	0.06	0.05	+	0.05	0.05	+
Junior	−0.01	0.04		−0.01	0.04	
Han	0.03	0.05		0.03	0.05	
Married	−0.05	0.06	*	−0.05	0.05	*
Junior high school	0.02	0.07		0.00	0.07	
High school	0.04	0.07		0.04	0.07	
College and above	0.10	0.08	+	0.09	0.08	+
Family income	−0.03	0.02		−0.04	0.02	
Welfare status	−0.01	0.04		−0.01	0.04	
Number of family members	−0.02	0.02		−0.02	0.02	
COVID-19 infection in family and friends	−0.09	0.18	***	−0.07	0.18	**
College fixed effects	Yes			Yes		
Adjusted *R*-square	0.06			0.08		

*N = 1,871. +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001.*

TABLE 4 | Robustness tests of ACE subscales and items on mindfulness.

	Mindfulness			
	Beta	**S. E.**	***P***	**Adjusted *P***
Whole ACE scale				
Adverse childhood experience	−0.21	0.01	***	***
Three dimensions				
Abuse	−0.17	0.03	***	***
Neglect	−0.16	0.04	***	***
Household challenge	−0.13	0.03	***	***
Individual items				
Emotional abuse [0–1]	−0.16	0.05	***	***
Physical abuse [0–1]	−0.11	0.07	***	***
Sexual abuse [0–1]	−0.11	0.05	***	***
Emotional neglect [0–1]	−0.16	0.05	***	***
Physical neglect [0–1]	−0.09	0.10	***	***
Parental separation or divorce [0–1]	−0.07	0.06	*	
Mother treated violently [0–1]	−0.07	0.11	**	*
Substance abuse in the household [0–1]	−0.11	0.12	***	***
Mental illness in the household [0–1]	−0.09	0.08	***	***
Incarcerated household member [0–1]	−0.04	0.10	+	

*N = 1,871. +p< 0.10, *p < 0.05, **p < 0.01, ***p < 0.001.*
*Each entry in **Table 4** represents a different multivariate regression analysis with the same controls listed in Model 2 of **Table 3**. For simplicity, we only present the results for the ACE items in **Table 4**. Adjusted P was the significance level of the observed p-value multiplied by the number of tests performed, 14.*

outcomes (18, 32, 33). In addition to the negative effect of ACEs on mindfulness found in this study, ACEs have been shown to be associated with negative outcomes, such as increased trauma, poor mental health, and greater delinquent and impulsive behaviors (12, 15, 33). To prevent ACEs, school social workers and practitioners can administer the ACE questionnaire annually to identify students with ACEs risk or at early stages of ACEs and provide services to them accordingly. In addition, as shown in our study, individuals who experienced neglect face similar harms to their mindfulness as those who experienced abuse. Despite neglect having been indicated as one of the most common forms of child maltreatment, professional, and scholarly attention has most often been directed to sexual and physical abuse, causing a "neglect of child neglect" (34). School social workers and practitioners need to pay attention to students with histories of neglect as they do to students who have been abused.

Mindfulness has been known to be an important protective factor for life development and various outcomes; recent studies have suggested that mindfulness may have a mediating effect on the relation between ACEs and these outcomes (4, 18, 32). Mindfulness, for example, is positively associated with self-regulation and emotional regulation, which may in turn allow individuals to better engage in the recognition, management, and resolution of overwhelming sensations, thoughts, and emotions. Mindful individuals can thus take the time to make decisions that promote their well-being. Indeed, past studies have reported the mediating effects of mindfulness on the association between ACEs and outcomes like alcohol use (32) and cyberbullying (18). Thus, the results of this study call for mindfulness-based interventions and services to students with high ACE scores as a strategy to buffer the negative effects of ACEs and to advance individuals' mindfulness and other life outcomes. Studies have shown that mindfulness-based stress reduction

(MBSR), mindfulness-based cognitive therapy (MBCT), and mindfulness-based interventions (MBI) all can effectively reduce psychological distress and promote mental health and well-being (1, 35–38). For example, Joss et al. (37) adopted an 8 week MBSR program for young adults with a childhood maltreatment history and found that their changes in mindfulness positively correlated with their changes in self-compassion ($r = 0.58$, $p = 0.001$). Change in self-compassion were negatively correlated with changes in depression ($r = -0.37$, $p = 0.05$) and anxiety ($r = -0.40$, $p < 0.05$). The results support that the mindfulness-based intervention was helpful in improving self-compassion and psychological health of the sample (37). The majority of mindfulness-based interventions, however, focus on individuals who have experienced traumatic events and have psychopathological issues [e.g., (39–42)], while relatively fewer focus on the population of individuals who have experienced emotional abuse and neglect (43). The findings in this study underscore the importance of mindfulness-based interventions in potentially buffering the effects of ACEs on mindfulness and other life outcomes for those with experiences of child neglect.

With respect to the cultural and societal context of our study, it is notable that Chinese society has not sufficiently perceived ACEs, such as exposure to domestic violence, emotional abuse, and neglect, as threats to child and youth development yet (20, 21). Furthermore, influenced heavily by conservative and patriarchal family values, many may perceive ACEs as private family issues that should only be kept within the family and hidden from others (21, 44). Governments, agencies, and professionals should initiate various programs to promote public awareness of ACEs in China. For instance, community-based interventions could be a beneficial tool to advance public understanding and awareness of ACEs in communities and serve individuals who with a history of ACEs (45, 46). Home-based interventions should improve adults', particularly parents', knowledge of harmful family environments and positive parenting (47, 48).

This study has several limitations. First, our analyses were based on a cross-sectional dataset, which can only approximate an associative relationship, rather than a causal one, among ACE, COVID-19 infection, and mindfulness during the pandemic. Future research can use a longitudinal design to examine the causal relationship of these variables. Second, there were other unobserved variables, such as peer support and conflict, that could affect mindfulness but were not included in the study. The absence of these unobserved variables may have effects on the estimates reported in this study. Third, measures of mindfulness should comprehensively measure different dimensions of mindfulness. The measurement instrument used to assess mindfulness in this study, MAAS, was designed to measure the receptive state of mind (49). MAAS has been found to be positively related to emotional and behavioral regulation, and studies have found a high correlation between mindful attention and mindful metacognition (4, 49); however, some studies suggest that MAAS may lack construct validity (50–52). Future studies may therefore consider using a comprehensive and valid measure of mindfulness, such as Five Facet Mindfulness Questionnaire (FFMQ), which includes facets like non-judgmental inner experience and non-reactivity (53). Fourth, the findings of this study are based on data from social science departments in 12 colleges across China. Although the sample size and diversity of colleges across regions both increase our confidence, the extent to which these findings can be generalizable to all Chinese college students is unknown and requires further research. Finally, data gathered on key variables such as mindfulness and ACEs were from self-reports of the subjects. Self-reporting leaves our data subject to unintended and intended reporting errors, including social desirability bias, particularly for ACEs. Future studies might consider triangulating findings from different data sources, such as peer or teacher reports. Despite these limitations, the present study contributes to the knowledge on the factors that may contribute to mindfulness of Chinese college students during the COVID-19 pandemic.

CONCLUSION

Empirical evidence has shown that mindfulness is associated with positive social and emotional competence, as well as academic performance in students (5–8). Meanwhile, the antecedents of mindfulness are relatively understudied (4, 8), though trauma theory (15) suggests that traumatic events, like ACEs, may very well-affect the mindfulness of individuals. This study analyzed data collected from 1,871 college students across China to investigate the extent to which ACEs affect mindfulness of college students. The findings of this study support the cross-cultural application of trauma theory (15) to a Chinese sample and indicate that ACEs significantly reduced students' mindfulness during the COVID-19 pandemic. The results underscore the importance of mindfulness-based interventions in potentially buffering the effects of ACEs on mindfulness, particularly for those with past experiences of emotional abuse and neglect and in a non-Western context such as China.

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 human participants were reviewed and approved by Rutgers University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR'S NOTE

Mindfulness has been found to have many positive effects on life outcomes, including mental health and educational achievement. However, less is known about the antecedents of mindfulness, particularly in Chinese college students. This study examines the effect of adverse childhood experiences (ACEs) on mindfulness among Chinese college students in September 2020, during the COVID-19 pandemic. The data were collected from 1,871 college students from 12 colleges across China. The results indicate that ACEs and COVID-19 infection in family and friends were negatively associated with mindfulness. In particular, emotional abuse and neglect in childhood appear to have the most negative effects on mindfulness compared to other dimensions of ACEs such as physical abuse and household challenges. The findings of this article provide essential information to understand the antecedents of mindfulness in Chinese college students, especially during the COVID-19 pandemic, and offer vital implications for practice and recommendations for future research.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

REFERENCES

1. Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. *Clin Psychol Sci Pract.* (2003) 10:144–56. doi: 10.1093/clipsy.bpg016
2. Bishop SR, Lau M, Shapiro S, Carlson L, Anderson ND, Carmody J, et al. Mindfulness: a proposed operational definition. *Clin Psychol Sci Pract.* (2004) 11:230–41. doi: 10.1093/clipsy.bph077
3. Keng SL, Smoski MJ, Robins CJ. Effects of mindfulness on psychological health: a review of empirical studies. *Clin Psychol Rev.* (2011) 31:1041–56. doi: 10.1016/j.cpr.2011.04.006
4. Reina CS, Kudesia RS. Wherever you go, there you become: how mindfulness arises in everyday situations. *Organ Behav Hum Dec Process.* (2020) 159:78–96. doi: 10.1016/j.obhdp.2019.11.008
5. Klingbeil DA, Renshaw TL, Willenbrink JB, Copek RA, Chan KT, Haddock A, et al. Mindfulness-based interventions with youth: a comprehensive meta-analysis of group-design studies. *J Sch Psychol.* (2017) 63:77–103. doi: 10.1016/j.jsp.2017.03.006
6. Schonert-Reichl KA, Lawlor MS. The effects of a mindfulness-based education program on pre- and early adolescents' well-being and social and emotional competence. *Mindfulness.* (2010) 1:137–51. doi: 10.1007/s12671-010-0011-8
7. Caballero C, Scherer E, West MR, Mrazek MD, Gabrieli CF, Gabrieli JD. Greater mindfulness is associated with better academic achievement in middle school. *Mind Brain Educ.* (2019) 13:157–66. doi: 10.1111/mbe.12200
8. Lu S, Huang C, Rios J. Mindfulness and academic performance: an example of migrant children in China. *Child Youth Serv Rev.* (2017) 82:53–9. doi: 10.1016/j.childyouth.2017.09.008
9. Huang CC, Chen Y, Greene L, Cheung S, Wei Y. Resilience and emotional and behavioral problems of adolescents in China: effects of a short-term and intensive mindfulness and life skills training. *Child Youth Serv Rev.* (2019) 100:291–7. doi: 10.1016/j.childyouth.2019.03.015
10. Van de Weijer-Bergsma E, Formsma AR, Bruin EI, Bögels SM. The effectiveness of mindfulness training on behavioral problems and attentional functioning in adolescents with ADHD. *J Child Family Stud.* (2011) 21:775–87. doi: 10.1007/s10826-011-9531-7
11. Center for Disease Control and Prevention. *About the CDC-Kaiser ACE Study*. Retrieved from https://www.cdc.gov/violenceprevention/aces/about.html?CDC_AA_refVal=https%3A%2F%2F%2Fviolenceprevention%2Facestudy%2Fabout.html (accessed October 16, 2020).
12. Anda R, Felitti V, Bremner J, Walker J, Whitfield C, Perry B, et al. The enduring effects of abuse and related adverse experiences in childhood. *Euro Arch Psychiatry Clin Neurosci.* (2006) 256:174–86. doi: 10.1007/s00406-005-0624-4
13. Merrick MT, Ford DC, Ports KA, Guinn AS, Chen J, Klevens J, et al. Vital signs: estimated proportion of adult health problems attributable to adverse childhood experiences and implications for prevention−25 states, 2015-2017. *Morbid Mortal Wkly Rep.* (2019) 68:999–1005. doi: 10.15585/mmwr.mm6844e1
14. Shonkoff JP, Garner AS, The Committee on Psychosocial Aspectts of Child Family Health, Committee on Early Childhood Adoption Dependent Care Sectiion on Developmental Behavioral Pediatrics, Siegel BS, Dobbins MI, et al. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics.* (2012) 129:e232–46. doi: 10.1542/peds.2011-2663
15. Herman JL. *Trauma and Recovery*. New York, NY: Basic Books (1992).
16. Voith LA, Russell K, Lee H, Anderson RE. Adverse childhood experiences, trauma symptoms, mindfulness, and intimate partner violence: therapeutic implications for marginalized men. *Family Process.* (2020) 59:1588–607. doi: 10.1111/famp.12533
17. Forner C. What mindfulness can learn about dissociation and what dissociation can learn from mindfulness. *J Trauma Dissociation.* (2019) 20:1–15. doi: 10.1080/15299732.2018.1502568
18. Emirtekin M, Balta S, Kircaburun K, Griffiths MD. Childhood emotional abuse and cyberbullying perpetration among adolescents: the mediating role of trait mindfulness. *Int J Ment Health Addict.* (2020) 18:1548–59. doi: 10.1007/s11469-019-0055-5
19. Nagel KE, Dearth-Wesley T, Herman AN, Herman AN, Smith HG, Gandica RG, et al. The association between dispositional mindfulness and glycemic control in type 1 diabetes during early adulthood: differences by age and adverse childhood experiences. *Pediatr Diabetes.* (2020) 21:681–91. doi: 10.1111/pedi.13000
20. Fang X, Fry DA, Ji K, Finkelhor D, Chen J, Lannen P, et al. The burden of child maltreatment in China: a systematic review. *Bull World Health Organ.* (2015) 93:176–85C. doi: 10.2471/BLT.14.140970
21. He X, Hang Ng K. In the name of harmony: the erasure of domestic violence in China's judicial mediation. *Int J Law Policy Family.* (2013) 27:97–115. doi: 10.1093/lawfam/ebs014
22. Costa H, Ripoll P, Sánchez M, Carvalho C. Emotional intelligence and self-efficacy: Effects on psychological well-being in college students. *Span J Psychol.* (2013) 16:E50. doi: 10.1017/sjp.2013.39
23. Hout M. Social and economics returns to college education in the United States. *Ann Rev Sociol.* (2012) 38:379–400. doi: 10.1146/annurev.soc.012809.102503
24. Li H, Meng L, Shi X, Wu B. Does attending elite colleges pay in China? *J Comparat Econ.* (2012) 40:78–88. doi: 10.1016/j.jce.2011.10.001
25. Long MC. College quality and early adult outcomes. *Econ Educ Rev.* (2008) 27:588–602. doi: 10.1016/j.econedurev.2007.04.004
26. Marginson S. Higher education, economic inequality and social mobility: implications for emerging East Asia. *Int J Educ Dev.* (2017) 63:4–11. doi: 10.1016/j.ijedudev.2017.03.002
27. Brown KW, West AM, Loverich TM, Biegel GM. Assessing adolescent mindfulness: validation of an adapted mindful attention awareness scale in adolescent normative and psychiatric populations. *Psychol Assess.* (2011) 23:1023–33. doi: 10.1037/a0021338
28. Deng YQ, Li S, Tang YY, Zhu H, Ryan R, Brown K, et al. Psychometric properties of the Chinese translation of the mindful attention awareness scale (MAAS). *Mindfulness.* (2012) 3:10–4. doi: 10.1007/s12671-011-0074-1
29. Fu H, Feng T, Qin J, Wanf T, Wu X, Cai Y, et al. Reported prevalence of childhood maltreatment among Chinese college students: a systematic review and meta-analysis. *PLoS ONE.* (2018) 13:e0205808. doi: 10.1371/journal.pone.0205808
30. Zhang L, Mersky JP, Topitzes J. Adverse childhood experiences and psychological well-being in a rural sample of Chinese young adults. *Child Abuse Neglect.* (2020) 108:104658. doi: 10.1016/j.chiabu.2020.104658
31. Tan J, Lo P, Ge N, Chu F. Self-esteem mediates the relationship between mindfulness and social anxiety among Chinese undergraduate students. *Soc Behav Pers Int J.* (2016) 44:1297–304. doi: 10.2224/sbp.2016.44.8.1297
32. Brett EI, Espeleta HC, Lopez SV, Leavens EL, Leffingwell TR. Mindfulness as a mediator of the association between adverse childhood experiences and alcohol use and consequences. *Addict Behav.* (2018) 84:92–8. doi: 10.1016/j.addbeh.2018.04.002

33. Merrick MT, Ports KA, Ford DC, Afifi TO, Gershoff ET, Grogan-Kaylor A. Unpacking the impact of adverse childhood experience on adult mental health. *Child Abuse Neglect*. (2017) 69:10–9. doi: 10.1016/j.chiabu.2017.03.016
34. Stoltenborgh M, Bakermans-Kranenburg MJ, van Ijzendoorn MH. The neglect of child neglect: a meta-analytic review of the prevalence of neglect. *Soc Psychiatry Psychiatr Epidemiol.* (2013) 48:345–55. doi: 10.1007/s00127-012-0549-y
35. Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-based stress reduction and health benefits: a meta-analysis. *J Psychosom Res.* (2004) 57:35–43. doi: 10.1016/S0022-3999(03)00573-7
36. Harris NB. *The Deepest Well: Healing the Long-Term Effects of Childhood Adversity*. New York, NY: Houghton Mifflin Harcourt (2018).
37. Joss D, Khan A, Lazar SW, Teicher MH. Effects of a mindfulness-based intervention on self-compassion and psychological health among young adults with a history of childhood maltreatment. *Front Psychol.* (2019) 10:2373. doi: 10.3389/fpsyg.2019.02373
38. Zoogman S, Goldberg SB, Hoyt WT, Miller L. Mindfulness interventions with youth: a meta-analysis. *Mindfulness.* (2014) 6:290–302. doi: 10.1007/s12671-013-0260-4
39. Hofmann SG, Sawyer AT, Witt AA, Oh D. The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. *J Consult Clin Psychol.* (2010) 78:169–83. doi: 10.1037/a0018555
40. Katz D, Toner B. A systematic review of gender differences in the effectiveness of mindfulness-based treatments for substance use disorders. *Mindfulness.* (2013) 4:318–31. doi: 10.1007/s12671-012-0132-3
41. Kimbrough E, Magyari T, Langenberg P, Chesney M, Berman B. Mindfulness intervention for child abuse survivors. *J Clin Psychol.* (2010) 66:17–33. doi: 10.1037/e517292011-413
42. Teasdale JD, Segal ZV, Williams JMG, Ridgeway VA, Soulsby JM, Lau MA. Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *J Consult Clin Psychol.* (2000) 68:615–23. doi: 10.1037/0022-006X.68.4.615
43. Van der Gucht K, Takano K, Van Broeck N, Raes F. A mindfulness-based intervention for economically disadvantaged people: effects on symptoms of stress, anxiety, and depression and on cognitive reactivity and overgeneralization. *Mindfulness.* (2015) 6:1042–52. doi: 10.1007/s12671-014-0353-8
44. Yick AG. Predictors of physical spousal/intimate violence in Chinese American families. *J Family Viol.* (2000) 15:249–67. doi: 10.1023/A:1007501518668
45. Cameron LD, Carroll P, Hamilton WK. Evaluation of an intervention promoting emotion regulation skills for adults with persisting distress due to adverse childhood experiences. *Child Abuse Negl.* (2018) 79:423–33. doi: 10.1016/j.chiabu.2018.03.002
46. Larkin H, Shields JJ, Anda RF. The health and social consequences of adverse childhood experiences (ACE) across the lifespan: an introduction to prevention and intervention in the community. *J Prevent Intervent Commun.* (2012) 40:263–70. doi: 10.1080/10852352.2012.707439
47. DuMont K, Mitchell-Herzfeld S, Greene R, Lee E, Lowenfels A, Rodriguez M, et al. Healthy families New York (HFNY) randomized trial: effects on early child abuse and neglect. *Child Abuse Negl.* (2008) 32:295–315. doi: 10.1016/j.chiabu.2007.07.007
48. Eckenrode J, Ganzel B, Henderson CR,Jr., Smith E, Olds DL, Powers J, et al. Preventing child abuse and neglect with a program of nurse home visitation: the limiting effects of domestic violence. *JAMA.* (2000) 284:1385–91. doi: 10.1001/jama.284.11.1385
49. Brown KW, Ryan RM. The benefits of being present: mindfulness and its role in psychological well-being. *J Personal Soc Psychol*. (2003) 84:822–48. doi: 10.1037/0022-3514.84.4.822
50. Christopher MS, Charoensuk S, Gilbert BD, Neary TJ, Pearce KL. Mindfulness in Thailand and the United States: a case of apples versus oranges? *J Clin Psychol.* (2009) 65:590–612. doi: 10.1002/jclp.20580
51. MacKillop J, Anderson EJ. Further psychometric validation of the mindful attention awareness scale (MAAS). *J Psychopathol Behav Assess.* (2007) 29:289–93. doi: 10.1007/s10862-007-9045-1
52. Van Dam NT, Earleywine M, Borders A. Measuring mindfulness? An item response theory analysis of the mindful attention awareness scale. *Pers Indiv Diff.* (2010) 49:805–10. doi: 10.1016/j.paid.2010.07.020
53. Baer RA, Smith GT, Lykins E, Button D, Krietemeyer J, Sauer S, et al. Construct validity of the five facet mindfulness questionnaire in mediating and nonmediating samples. *Assessment.* (2008) 15:329–42. doi: 10.1177/1073191107313003

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 28 May 2021
doi: 10.3389/fpsyt.2021.642784

The Differential Impact of Lockdown Measures Upon Migrant and Female Psychiatric Patients – A Cross-Sectional Survey in a Psychiatric Hospital in Berlin, Germany

James K. Moran*, Joachim Bretz, Johanna Winkler, Stefan Gutwinski, Eva J. Brandl and Meryam Schouler-Ocak

Department of Psychiatry and Psychotherapy, St. Hedwig Hospital, Charité-Universitätsmedizin Berlin, Berlin, Germany

OPEN ACCESS

Edited by:
Ghayda Hassan,
Université du Québec à Montréal, Canada

Reviewed by:
Bernd Hanewald,
University of Giessen, Germany
Simon Wolf,
Charité - Universitätsmedizin Berlin, Germany

****Correspondence:***
James K. Moran
james-kenneth.moran@charite.de

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *16 December 2020*
Accepted: *28 April 2021*
Published: *28 May 2021*

Citation:
Moran JK, Bretz J, Winkler J, Gutwinski S, Brandl EJ and Schouler-Ocak M (2021) The Differential Impact of Lockdown Measures Upon Migrant and Female Psychiatric Patients – A Cross-Sectional Survey in a Psychiatric Hospital in Berlin, Germany. Front. Psychiatry 12:642784. doi: 10.3389/fpsyt.2021.642784

The COVID-19 pandemic could have major effects on already vulnerable individuals with psychiatric disorders. It is important to assess how different patient groups respond to stress related to the pandemic, and what additional factors influence it, including family-related stress, migration background, and sex. We conducted a survey in a sample of 294 psychiatric patients in a large outpatient clinic in Berlin, measuring level of distress in relation to COVID-19 lockdown as well as family-related distress. We also measured potential influencing factors such as media consumption and medical support. In the migration background group, we found that women had more lockdown related psychological distress than men. This was not apparent in those patients with a German background. We found that females were more strongly affected by family-related distress, particularly those with a migration background. People with PTSD were most strongly affected by family-related distress, whereas people with psychotic disorders and addiction reported the least distress. There were no effects of media consumption. There were no differences in ability to abide by the lockdown related restrictions across diagnoses. Our results support earlier findings on differential vulnerability of diagnostic groups to these stressors. Thus, clinicians can optimize treatment by taking family-related stressors into account particularly for females and people with a migrant background.

Keywords: COVID-19, lockdown measures, migrant psychiatric patient, cultural psychiatry, survey

INTRODUCTION

The COVID-19 crisis has necessitated radical society-wide interventions to limit the spread of the SARS-CoV-2 virus. Some of these are comparatively minor – enforcing stricter hygiene and masks, others required major readjustments to everyday life. In particular periods of "lockdown" that first took place for the first time in many countries between March and June 2020. In Germany at this time, this involved a series of escalating restrictions to everyday life, including limitations on gatherings (meeting with maximum 1 person other than people you live with, in open air, legal penalty for large gatherings such as parties), travel restrictions (only essential travel overseas or within Germany permitted), minimization of movement outside of the house (limited essential things such as shopping, doctor appointments), restaurants, bars, retailers were closed (1). The isolation and stress appear to have had a psychological affected the general population, with higher depression, anxiety, and stress related disorders (2).

To date, studies on the responses of psychiatric patients to the pandemic conditions suggest that psychiatric patients are more strongly affected by strict lockdown measures in comparison to healthy controls, including insomnia, PTSD symptoms, and suicide ideation (3). Another study found a generally low level of knowledge of COVID-19, lower compliance with health regulations and a lower level of anxiety regarding COVID-19 in comparison to the general population (4). Attempts to test the differential impact of the pandemic suggest that people with affective disorders are far more affected by the restrictions imposed by COVID-19, whereas people with psychotic disorders are less affected (5, 6) Specific population groups may be especially vulnerable to stress resulting from the COVID-19 crisis. Psychiatric patients have more precarious employment (7); smaller social networks (8); lower health literacy (9); greater physical vulnerability via higher rates of obesity (10), and smoking (11, 12). Moreover, lockdown and quarantine could exacerbate symptoms via loneliness, isolation and double stigma (8). Studies further suggest that certain groups of psychiatric patients may have greater difficulty adhering to the various restrictions such as social distancing, and stricter hygiene, via reduced executive function (12), maladaptive denial of illness (13), psychotic interpretation of the illness (14).

The potential vulnerability of psychiatric patients to the burden of lockdown measures is compounded by other demographic factors, in particular migration background. People with a migration background show generally worse health outcomes (15), this applies more specifically to anxiety disorders, including PTSD (16), depression (17), psychosis (18, 19) and suicide mortality (20, 21). Effects of psychiatric problems can be intergenerational, for example, traumatized survivors of war can have a harsh punitive parenting style, leading to greater aggression, parental depression and anxiety affects early attachment (22). Subsequent generations of migrants are thus correspondingly at higher risk of poor health outcomes (23, 24). There is evidence to suggest that ethnic minorities are disproportionately affected by the current pandemic (25, 26), partly as worse overall health outcomes in certain populations (e.g., African Americans with greater hypertension, and diabetes), and likelihood of living in high-density housing. The greater risk of the getting the virus could increase anxiety in the lockdown situation.

There are also differences in health outcomes for females and males. In the context of COVID-19, it appears that males are more strongly affected by contraction of the virus itself (27), which may lead to a higher level of anxiety during lockdown. In contrast, the indirect consequences could potentially affect females more due to their greater socioeconomic vulnerability (28). In particular, there are indications of increased domestic violence (29, 30).

Certain other factors also potentially influence the impact of COVID-19 on psychiatric patients. For example, increased media exposure relating to COVID-19 predicts greater distress in psychiatric patients (31, 32). In contrast, adequate support can have a protective effect (33, 34).

The present study examines the experience of the pandemic for a cohort of outpatients at a large psychiatric outpatient clinic in Berlin, Germany, with a high percentage of patients with a migration background. This diverse sample provides an opportunity to examine the effect of the pandemic on different diagnostic groups, as well as across migrant background and gender. Furthermore, the effects of the pandemic on family life and the influence of the media are also measured. We also test whether there were differences in the ability to comply with hygiene and other lockdown measures across these different groups.

METHODS

Participants

From April 1st 2020 to June 30th 2020, we invited patients at the outpatient psychiatric clinic at the Psychiatric University Hospital of the Charité at St Hedwig hospital, Berlin, Germany, who did not fulfill exclusion criteria to participate in the study (acute suicidality, severe cognitive impairment). The clinic treats around 1,500 patient per quarter at its branches. Of these, we recruited a sample of $N = 294$ patients. The survey was administered in the context of an ordinary consultation, where clinicians' sometimes work under time pressure and the patients' own priorities are often focused on their own acute needs in the moment. This meant that not all of the potential pool of patients could be offered the survey, accounting in part for the relatively small proportion of respondents. The survey was conceived to be conducted in interview form by all staff of the clinic after a training session (nurses, psychologists, physicians, social workers). However, the survey could also be taken home to be filled in by the patient and brought back later in the same quarter. Sometimes the first few questions were administered in interview form, and the patient was asked to complete the questionnaire after the consultation. Telephone consultations accounted for 47% of the sample. If needed, the interviews were done in the native language of migrant patients via interpreters. The study was approved by the Ethics Committee of the Charité, Universitätsmedizin Berlin (EA4/251/19).

The statistical analyses were carried out with R 3.6.3. For ANOVA, Kruskall-Wallace tests with follow up Dunn's tests for contrasts were used where assumptions were not fulfilled [homogeneity of variance (Levene's test), normality (Shapiro-Wilk), extreme outliers ($>|4|$ SD)]. *Post-hoc* contrasts were corrected for multiple comparisons using Bonferroni or Benjamini-Hochberg corrections. For crosstabulation statistics, we used either χ^2-square statistics or Fischer exact tests, according to the numbers in the cell sizes. Where the null hypothesis of independence was not supported, we examined the deviation of cell numbers from standardized residuals, adjusting the threshold of significance against the number of comparisons with Bonferroni contrasts. Where the interpretation of a null finding was relevant, we computed we computed Bayes Factors [BF10, (35)] as an indicator of the relative evidence for the H0 and H1. BFs between 1 and 3 indicate anecdotal support for the alternative hypothesis (H1) while BF between 3 and 10 and above 10 indicate respectively moderate and strong support for H1. BF = 1 indicates equal support for H1 and null hypothesis (H0) while BF between 1/3–1, 1/10–1/3, and below 1/10, provide respectively anecdotal, moderate, and strong support for H0 (36).

Because we were interested in the way that people with a migration background were possibly affected by the COVID-19 crisis, we distinguished between people with a German background, and those with a migrant background. The latter is defined as people who were either born outside of Germany, or who are born from parents who migrated to Germany.

Survey Development

Potentially relevant demographic variables were collected, including age, sex, ICD-10 diagnosis, daily hours of media consumed, and details of migration background where applicable, including number of years in Germany. We generated a questionnaire on the basis of our experiences with patients during COVID-19. We asked about the different potential ways in which COVID-19 could affect individuals (fear for loved ones, sleep, physical complaints, anxiety, worsening symptoms, and drug consumption, fear of contagion). These were classified in a binary manner (yes/no), and then summed to make the variable "Lockdown related distress," with a potential score range of 0–7). We also measured family-related distress in the same way (more household tension, more work, overwhelmed, more arguments, more domestic violence), to create the outcome variable "Family-related distress," with a potential score range of 0–5. Additionally, we asked whether other factors such as news media consumption and the feeling that they have a doctor that understands their problems and supports them, affected the state of patients.

RESULTS

Demographic variables, including age and sex, years spent in Germany, diagnosis, migration background, country of origin, daily hours of media consumption, years in Germany, current family living arrangements, contact type, and reason for contact, are shown in **Table 1**. For the subsequent analyses of the specific diagnostic groups, we grouped disorders with small numbers of affected patients. Because of a large number of missing responses, the number participants for the different analyses ranged from 221 to 294. Because the questionnaire is not based on a standardized questionnaire with e.g., an established factor structure, we did not use a data imputation strategy.

TABLE 1 | Demographic information for survey participants missing data for each group are included.

Variable (*N*, missing)		
Age (280,14)	mean	
M *(SD)* [Range]	44.61 *(12.85)* [18–78]	
Sex (279, 15)	female	male
N (%)	153 *(54.8)*	126 *(45.2)*
Migration background (280,14)	German background	Migration background
N (%)	135 *(48.2)*	145 *(51.8)*
Country *N (%)*		Turkey 55 (*19.6*) Afghanistan 17 (*6.1*)
		Syria 7 (*2.5*)
		Lebanon 5 (*1.8*)
		Iraq 4 (*1.4*)
		Iran 4 (*1.4*)
		Other 53 (*18.9*)
Migrant years in Germany (125, 20) M *(SD)* [Range]	20 *(16.86)* [1–75]	
Hours of media consumed per day (263, 31) M *(SD)* [Range]	1.37 *(1.78)* [0–12]	
living alone (282,12)	with others	alone
N (%)	148 *(52.5)*	134 *(47.5)*
living with family (267,27)	with family	other
N (%)	126 *(47.2)*	141 *(52.8)*
Diagnosis (248, 46) *N (%)*	F1 Addiction	8 *(3.2)*
	F2 Psychotic disorder	45 *(18.1)*
	F3 Mood disorder	101 *(40.7)*
	F43 trauma related disorder	18 *(7.3)*
	F4 40 41 anxiety disorder	37 *(14.9)*
	F4 44, 45 other neurotic disorder	12 *(4.8)*
	F6 personality disorder	10 *(4)*
	F0, F42, F5, F7, F8, F9 other	17 *(6.8)*
Contact	Regular appointment 148 spontaneous 137	
	Telephone 135 Face to face 150 Interpreter 11	
Reason	Prescription 56 Need to talk 145 Crisis 1 Other 54	

Family-related distress stemming from COVID-19 restrictions are outlined in **Table 2A**. A greater general level of tension in the household was reported by the majority of patients (56.49%), with similarly high amounts of house work (54.85%). A small minority of people reported greater household violence (4.42%) (a follow up analysis of the last including only those people living with others ($N = 148$) showed a similar rate 4.41%). **Table 2B** shows overall outcomes for lockdown related distress, this encompasses psychological responses to COVID-19. A majority of patients reported worry about relatives (54.22%) and anxiety (52.10%), worse sleep (44.04%), more physical symptoms (35.99%) and a small minority reported increased drug consumption (13.15%). **Table 2C** shows responses to restrictions, suggesting close to ceiling level effects in regard to the ability to maintain hygiene, social-distancing, and stay informed. Patients were also invited to provide qualitative responses to the questions, some illustrative examples are provided.

TABLE 2 | Responses to the survey questions grouped into three themes from left to right: family related stress, lockdown related stress, and ability to cope with restrictions.

(A) Family-related distress:

How do you cope in the family with the restrictions (children at home, school and kindergarten, partner at home)?	Example of qualitative responses %	
more household tension	56.49	"my mother is fearful"
work problems	54.85	"my husband lost his job, that worries me"
overwhelmed	35.78	"worried that the kids would catch the virus"
more arguments	23.18	"everyday household stuff, like cleanliness"
more domestic violence	4.42	"no physical aggression, but more verbal aggression"

(B) Lockdown-related stress:

How are you coping with the Corona Crisis?	%	
worry about relatives overseas	54.22	"my mother, she has a condition that makes her vulnerable"
higher anxiety	52.10	"fear that all groceries will be sold out"
more psychological problems	48.10	"fear – I don't go out at all anymore"
worse sleep	44.04	"not enough exercise, disturbed day/night rhythm"
fear of catching the virus	39.07	"frightened of not getting a spot in hospital"
physical complaints	35.99	"exhaustion from brooding on the situation"
more drugs (alcohol, sedatives, cocaine, LSD, etc.)	13.15	"I smoke more at the moment"

(C) Coping with restrictions

	%	
do you feel well-informed?	86.22	"yeah, too much, I avoid the news and social media"
adhere to hygiene recommendations?	96.19	"I wash my hands but forget the mask and have to buy them when I'm out and about"
can you maintain social distancing?	89.82	"yes, but it's difficult on public transport"
Understanding doctor	67.40	"yes but the practice is large, with many different doctors"
more media consumption?	58.25	"at the beginning yes, now I avoid it"
more news?	56.21	"more TV, social media, otherwise talk with friends"

Percentages represent the percentage of affirmative responses across the whole sample.

These two sets of questions were combined into two numeric variables, family-related stress, and lockdown-related distress. Firstly, there was no association between the overall amount of family-related distress resulting from lockdown measures and the amount of media consumed [$F_{(1,\,261)} = 0.027\ p = 0.870$]. Similarly, there was no relation between the amount of individual stress and amount of media consumed [$F_{(1,\,261)} = 1.19\ p = 0.276$], or the presence of an understanding doctor [$F_{(1,\,271)} = 0.07$, $p = 0.787$]. To test for response bias, we analyzed whether there were differences in responses to the two outcome variables (family-related stress, and COVID distress) according to contact type (face-to-face, telephone, interpreter, regular appointment, spontaneous) as well as reason for appointment (prescription, need to talk, crisis, other). There were no differences across these response bias variables (all $p < 0.05$). Subsequent BF were all < 0.333, indicating strong support for the null hypothesis. One exception was the relation between reason for consultation and family-related distress, which at 1.04, indicated no clear distinction between H0 and H1.

To test whether lockdown-related stress varied across sex, and migration background a factorial ANOVA was run. There were main effects of migration background (see **Table 3A** and **Figure 1A**), suggesting that ~9.8% of variance in lockdown-related stress was related to migration background. Follow-up Bonferroni adjusted *post-hoc* contrasts showed that females with a migrant background had much higher levels of family pressure than males (Adj-mean difference $= 1.00$, $p_{\text{bonf}} = 0.037$). Amongst the people with a German background, there was no difference between males and females (Adj-Mean difference $= -0.094$, $p_{\text{bonf}} = 1.00$), see **Table 3A**.

To test whether family-related distress varied across sex, and migration background a factorial ANOVA was run. There were main effects of both migration background and sex (see **Table 3B** and **Figure 1B**). suggesting that ~9.7% of variance in lockdown-related stress was related to sex, and 3.6% was attributable to migration background. Follow-up Bonferroni adjusted *post-hoc* contrasts showed that females from a migrant background had much higher levels of family related stress than males (Adj-mean

TABLE 3 | ANOVA table for (A) Lockdown related stress against migration background and sex. (B) Family related pressure against migration background and sex.

(A) Lockdown related distress	$F_{(1,217)}$	η^2	(B) Family related distress	$F_{(1,217)}$	η^2
Migration background	23.56****	0.098	Migration background	8.16**	0.036
Sex	2.06	0.009	Sex	23.21****	0.097
Sex*migration background	3.62	0.016	Sex*migration background	1.64	0.007

Effect size = partial η^2. $^{**}p < 0.01$. $^{****}p < 0.0001$.

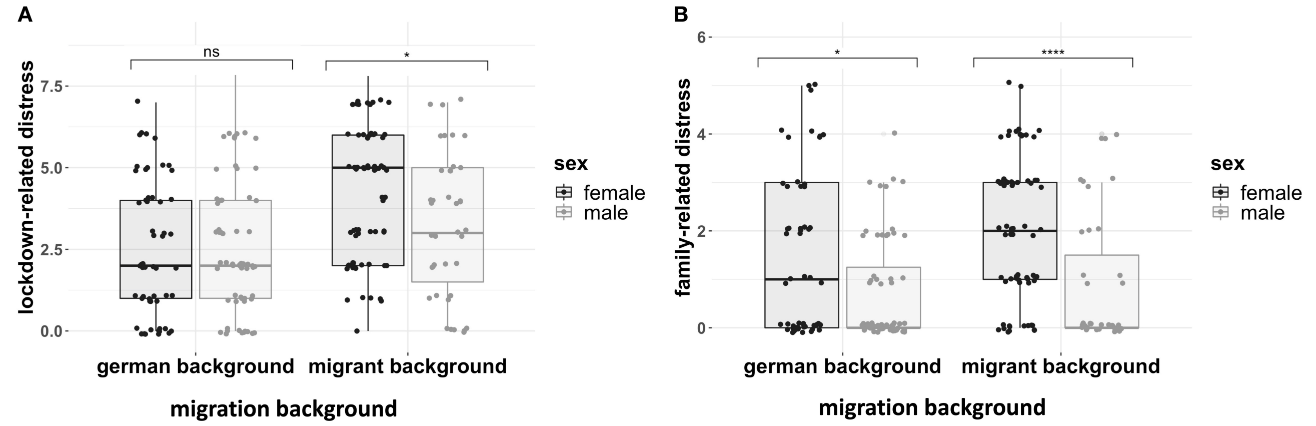


FIGURE 1 | (A) Lockdown-related distress across sex and migration background. **(B)** Family related distress across sex and migration background. Both boxplots show interquartile range, with the middle bar being the median value. $N = 221$. Significance bars refer to follow-up Bonferroni-adjusted contrasts ($^{****}p < 0.00001$, $^{*}p < 0.05$, ns = non-significant).

difference = 1.2, $p_{\text{bonf}} = 0.0001$). Amongst the people with a German background, the difference was also apparent but less pronounced (Adj-Mean difference = 0.69, $p_{\text{bonf}} = 0.020$), see **Table 3B**.

Lockdown Related Distress by Diagnosis

A non-parametric Kruskal-Wallis test showed that there was variation across different diagnostic categories for lockdown-related distress [χ^2 (7) = 16.82, $p = 0.019$]. Follow-up pairwise contrasts, corrected with Benjamini-Hochberg corrections, could not more precisely specify the difference between the diagnostic groups. Since there could be systematic differences across gender and migration background, we repeated the analysis separating them into groups. None of the analyses were significant.

Family-Related Distress by Diagnosis

A non-parametric Kruskal-Wallis test showed that there was variation across different diagnostic categories for family-related distress [χ^2 (7) = 19.32, $p = 0.007$] (**Figure 2**). Follow-up pairwise contrasts, corrected with Benjamini-Hochberg corrections, suggested that group with the highest level of family related stress – PTSD – differed significantly from those groups with the lowest family-related distress, namely schizophrenia ($Z = 3.40$, $p_{\text{bh}} = 0.019$), and substance-use disorders ($Z = 3.35$, $p_{\text{bh}} = 0.011$). Since there could be systematic differences across gender and migration background, we repeated the analysis separating them into groups. None of these analyses showed significant differences.

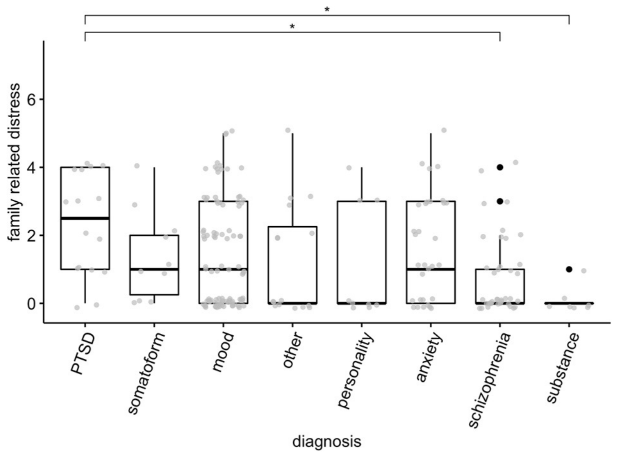


FIGURE 2 | Family related distress across different diagnoses. Boxes represent quartiles, black dots represent outliers. Gray points represent scores of individual patients. $^{*}p < 0.05$.

Migrant Responses to COVID-19 Measures

We asked patients how they were coping with the various restrictions relating to COVID-19 and whether this varied across gender or migration background. The overall responses for all patients are set out in **Table 2C**. These factors were individually examined for potential differences between gender and migration background using separate logistic regressions: how well-informed participants felt regarding COVID-19, whether they felt able to take precautionary measures (e.g., hand-washing, mask wearing), and how well they were able to maintain social-distance. A male with a German background was less than half as likely to report being able to maintain social distance compared to a male with a migration background (OR $= 0.44$, $z = 1.05$, $p = 0.028$). Otherwise, there were no differences across gender or migration background regarding how well-informed they felt or their capacity to take precautionary measures, or whether they felt understood by their doctors (all p-values > 0.05).

DISCUSSION

We found differences in response to family-related stress as well as lockdown-related stress according to sex, migration background and diagnostic group in psychiatric outpatients. We could not find evidence of difficulty holding to the new guidelines among our patients or any relation to hours media consumption.

Our sample reported higher levels of tension and stress in the household, only a small number of patients reported greater levels of domestic violence. Follow-up analysis showed that females reported greatest levels of family-related stress. This was valid across both participants with and without a migration background, although the effect on those with a migration background was stronger. This is perhaps because they more often have children than female outpatients without a migrant background (37). This supports hypotheses that females were more affected by the socioeconomic aspects of the pandemic (28). The in 4.42% reported cases of increased domestic violence is on the face of it, different to those reporting far higher prevalence (29, 30). It should be emphasized that this represents a reported relative increase, rather than an absolute amount of domestic violence. Results did not differ when excluding those who lived alone (4.41%). In the case of sensitive questions such as this, the influence of social desirability or shame in reporting domestic violence cannot be ruled out (38).

It appears that females with a migrant background showed greater individual negative effects in regard to Lockdown related stress. Thus, the higher risk of bad outcomes for men from the SARS-CoV-2 virus itself (28), does not translate into higher anxiety or stress levels. More research is needed to examine why women with a migrant background are particularly affected.

Earlier studies suggested different responses to external stressors in patients with different psychiatric disorders. For example, people with anxiety or depression were reported to respond with greater levels of decompensation to external stress, whereas those with psychosis were less affected by external stress (5, 31). Our results partly bear this out, with people with PTSD showing the highest level of lockdown related distress, and those with psychotic disorders showing the lowest levels of lockdown related distress. Patients with mood disorders trended in the same direction of greater distress as well but the difference was not significant. It is possible that patients with psychotic disorders, particularly schizophrenia, are driven more by endogenous factors with less influence from the outside (5). However, there are complex relations between social factors, and loneliness in serious mental illness (SMI) (39). For example, although endogenous symptoms appear to be the strongest determinants of quality of life in people with serious mental illness (SMI), (40), this is mediated by support from family and friends (40, 41). It is possible that their illness already exerts a severe baseline restriction on their quality of life, and therefore the effects of the pandemic are judged less severe in this context. Reports of our patients with psychotic disorder point in this direction, because they sometimes reported in the last months that they are experts in isolation, because they are always isolated, in contrast to the whole population for whom such restrictions are more novel. There was no interaction of gender and diagnosis or migration and diagnosis on either lockdown related distress or family related problems.

An earlier study found lower compliance with health regulations in psychiatric patients in comparison with healthy controls (4). In our study, the majority of patients reported feeling well-informed, and being able to comply with lockdown, social-distancing, and hygiene measures. It is possible that the patients refusing these regulations were also more likely to refuse participation in this survey. We have no healthy control comparison, so we cannot draw a general conclusion, however our results did tend toward ceiling effects (feeling well-informed, 86%; adhering to hygiene measures, 96%), thus making a major difference between psychiatric patients and healthy controls less probable.

We found no influence of media consumption upon subjectively experienced lockdown distress or family-related distress. This contrasts with other findings, showing that increased media exposure relating to COVID-19 predicts greater distress in psychiatric patients (31, 32). There could be several reasons for our null results in comparison to those of other researchers, e.g., differences between outpatient vs. inpatients, our clinic's focus of culturally sensitive psychiatric treatment, or differences between countries and cultures and relative impact of COVID-19. Clarifying this requires more focused research on this issue comparing potential factors across cultures.

Our study had several limitations. Given the novelty of the pandemic situation, we opted to tailor our survey questions directly to the situation, rather than adapt pre-existing questionnaires, which however has a cost in terms of reliably comparability to other findings. Our response rate was comparatively low, possibly introducing a selection bias into our data, e.g., perhaps the more conscientious patients or less crisis-stricken patients were more likely to take part. The decision to allow the patient to complete the survey at home was necessitated by time constraints in the outpatient clinic. We cannot exclude the possibility of response biases arising from this, although we found no evidence for differences in survey administration in our outcome variables. A mixed model would have been ideal means of considering the complex interactions of the different factors, however, the data did not fulfill necessary assumptions. We therefore employed simpler robust statistics with appropriate correction for multiple comparisons. Our null results, which stand in contrast to some other results need to be interpreted with the caution that an "absence of evidence is not evidence of absence."

Overall, our results are in agreement with other studies showing a greater impact of lockdown related stress on people with PTSD, and less effects on people with schizophrenia. Females show greater lockdown related distress as well as family-related distress. The latter is further exacerbated in those patients with a migration background. In which case, it would suggest the need for clinicians and clinics to take more consideration of the family situation in psychiatric outpatients during the pandemic, with a particular focus on people with a migrant background.

DATA AVAILABILITY STATEMENT

The datasets are available in a de-identified form from the corresponding author upon reasonable request.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of the Charité, Universitätsmedizin Berlin (EA4/251/19). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JM, JB, and EB: analysis. All authors study design, implementation, and manuscript preparation.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.642784/full#supplementary-material

REFERENCES

1. Federal German Government (2020). *22 March 2020: Corona Virus Rules*. Avaialable online at: https://www.bundesregierung.de/breg-de/leichte-sprache/22-maerz-2020-regeln-zum-corona-virus-1733310 (accessed April 20, 2021).
2. Henssler J, Stock F, van Bohemen J, Walter H, Heinz A, Brandt L. Mental health effects of infection containment strategies: quarantine and isolation—a systematic review and meta-analysis. *Eur Arch Psychiatry Clin Neurosci*. (2020) 271:223–34. doi: 10.1007/s00406-020-01196-x
3. Hao F, Tan W, Jiang L, Zhang L, Zhao X, Zou Y, et al. Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. *Brain Behav Immun*. (2020) 87:100–6. doi: 10.1016/j.bbi.2020.04.069
4. Muruganandam P, Neelamegam S, Menon V, Alexander J, Chaturvedi SK. COVID-19 and severe mental illness: impact on patients and its relation with their awareness about COVID-19. *Psychiatry Res*. (2020) 291:113265. doi: 10.1016/j.psychres.2020.113265
5. Hölzle P, Aly L, Frank W, Förstl H, Frank A. COVID-19 distresses the depressed while schizophrenic patients are unimpressed: a study on psychiatric inpatients. *Psychiatry Res*. (2020) 291:113175. doi: 10.1016/j.psychres.2020.113175
6. Winkler J, Jalilzadeh Masah D, Moran JK, Bretz J, Goldschmidt T, Tsagkas I, et al. Psychological stress during the COVID-19-pandemic: consequences for psychiatric patients and therapeutic implications. *Nervenarzt*. (2021) 92:243–51. doi: 10.1007/s00115-020-01056-y
7. Hakulinen C, Elovainio M, Arffman M, Lumme S, Suokas K, Pirkola S, et al. Employment status and personal income before and after onset of a severe mental disorder: a case-control study. *Psychiat Serv*. (2020) 71:250–5. doi: 10.1176/appi.ps.201900239
8. Druss BG. Addressing the COVID-19 pandemic in populations with serious mental illness. *JAMA Psychiatry*. (2020) 77:891. doi: 10.1001/jamapsychiatry.2020.0894
9. Kim SW, Park WY, Jhon M, Kim M, Lee JY, Kim SY, et al. Physical health literacy and health-related behaviors in patients with psychosis. *Clin Psychopharmacol Neurosci*. (2019) 17:279. doi: 10.9758/cpn.2019.17.2.279
10. Manu P, Dima L, Shulman M, Vancampfort D, De Hert M, Correll CU. Weight gain and obesity in schizophrenia: epidemiology, pathobiology, and management. *Acta Psychiatr Scand*. (2015) 132:97–108. doi: 10.1111/acps.12445
11. Dickerson F, Stallings CR, Origoni AE, Vaughan C, Khushalani S, Schroeder J, et al. Cigarette smoking among persons with schizophrenia or bipolar disorder in routine clinical settings, 1999–2011. *Psychiatr Serv*. (2013) 64:44–50. doi: 10.1176/appi.ps.201200143
12. Shinn AK, Viron M. Perspectives on the COVID-19 pandemic and individuals with serious mental illness. *J Clin Psychiatry*. (2020) 81:20com13412. doi: 10.4088/JCP.20com13412
13. Strauss DH, Spitzer RL, Muskin PR. Maladaptive denial of physical illness: a proposal for DSM-IV. *Am J Psychiatry*. (1990) 147:1168–72. doi: 10.1176/ajp.147.9.1168
14. Iancu I, Strous R, Poreh A, Potler M, Chelben Y. Psychiatric inpatients' reactions to the sars epidemic: an israeli survey. *Isr J Psychiatry Relat Sci*. (2005) 42:258–62
15. Lindert J, Ehrenstein OS, von, Priebe S, Mielck A, Brähler E. Depression and anxiety in labor migrants and refugees – a systematic review and meta-analysis. *Soc Sci Med*. (2009) 69:246–57. doi: 10.1016/j.socscimed.2009.04.032
16. Close C, Kouvonen A, Bosqui T, Patel K, O'Reilly D, Donnelly M. The mental health and wellbeing of first generation migrants: a systematic-narrative review of reviews. *Glob Health*. (2016) 12:47. doi: 10.1186/s12992-016-0187-3
17. Aichberger MC, Schouler-Ocak M, Mundt A, Busch MA, Nickels E, Heimann HM, et al. Depression in middle-aged and older first generation migrants in Europe: results from the Survey of Health, Ageing and Retirement in Europe (SHARE). *Eur Psychiatry*. (2010) 25:468–75. doi: 10.1016/j.eurpsy.2009.11.009
18. Brandt L, Henssler J, Müller M, Wall S, Gabel D, Heinz A. Risk of psychosis among refugees: a systematic review and meta-analysis. *Jama Psychiatry*. (2019) 76:1133–40. doi: 10.1001/jamapsychiatry.2019.1937
19. Coid JW, Kirkbride JB, Barker D, Cowden F, Stamps R, Yang M, et al. Raised incidence rates of all psychoses among migrant groups: findings from the east london first episode psychosis study. *Arch Gen Psychiatry*. (2008) 65:1250. doi: 10.1001/archpsyc.65.11.1250
20. Amiri S. Prevalence of suicide in immigrants/refugees: a systematic review and meta-analysis. *Arch Suicide Res*. (2020) 1–36. doi: 10.1080/13811118.2020.1802379
21. Patel K, Kouvonen A, Close C, Väänänen A, O'Reilly D, Donnelly M. What do register-based studies tell us about migrant mental health? A scoping review. *Syst. Rev*. (2017) 6:78. doi: 10.1186/s13643-017-0463-1
22. Betancourt TS. The intergenerational effect of war. *JAMA Psychiatry*. (2015) 72:199–200. doi: 10.1001/jamapsychiatry.2014.2669
23. Liu L, Li S, Zheng Y, Wang M. Intergenerational transmission of anxiety in Chinese migrant families: the mediating role of parents' perceptions of coparenting. *J Affect Disord*. (2021) 280:287–94. doi: 10.1016/j.jad.2020.10.069

24. Smith NR, Kelly YJ, Nazroo JY. Intergenerational continuities of ethnic inequalities in general health in England. *J Epidemiol Commun Health.* (2009) 63:253–8. doi: 10.1136/jech.2008.077495
25. Garg S. Hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed coronavirus disease 2019—COVID-NET, 14 States, March 1–30, 2020. *MMWR Morb Mortal Wkly Rep*. (2020) 69:458–64. doi: 10.15585/mmwr.mm6915e3
26. Kirby T. Evidence mounts on the disproportionate effect of COVID-19 on ethnic minorities. *Lancet Respir. Med*. (2020) 8:547–48. doi: 10.1016/S2213-2600(20)30228-9
27. Kopel J, Perisetti A, Roghani A, Aziz M, Gajendran M, Goyal H. Racial and gender-based differences in covid-19. *Front Public Health*. (2020) 8:418. doi: 10.3389/fpubh.2020.00418
28. The Lancet. The gendered dimensions of COVID-19. *Lancet (London, England)*. (2020) 395:1168. doi: 10.1016/S0140-6736(20)30823-0
29. Ghoshal R. Twin public health emergencies: covid-19 and domestic violence. *Indian J Med Ethics.* (2020) 05:195–99. doi: 10.20529/IJME.2020.056
30. Mazza M, Marano G, Lai C, Janiri L, Sani G. Danger in danger: interpersonal violence during COVID-19 quarantine. *Psychiatry Res.* (2020) 289:113046. doi: 10.1016/j.psychres.2020.113046
31. Poyraz BC, Poyraz CA, Turan S, Demirel OF, Kavla Y, Bulu E, et al. Immediate effects of COVID-19 outbreak on psychiatric outpatients: posttraumatic Stress and influencing factors. *MedRxiv [Preprint]*. (2020). doi: 10.1101/2020.08.12.20173468
32. Sun S, Goldberg SB, Lin D, Qiao S, Operario D. Psychiatric symptoms, risk, and protective factors among University students in quarantine during the COVID-19 pandemic in China. *Global Health*. (2020) 17:15. doi: 10.1186/s12992-021-00663-x
33. Li LZ, Wang S. Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Res.* (2020) 291:113267. doi: 10.1016/j.psychres.2020.113267
34. Ye Z, Yang X, Zeng C, Wang Y, Shen Z, Li X, et al. (2020) Resilience, social support, and coping as mediators between COVID-19-related stressful experiences and acute stress disorder among college students in China. *Appl Psychol*. 12:1074–94. doi: 10.1111/aphw.12211
35. Rouder JN, Speckman PL, Sun D, Morey RD, Iverson G. Bayesian t tests for accepting and rejecting the null hypothesis. *Psychon Bull Rev.* (2009) 16:225–37. doi: 10.3758/PBR.16.2.225
36. Aczel B, Palfi B, Szaszi B. Estimating the evidential value of significant results in psychological science. *PLoS ONE*. (2017) 12:e0182651. doi: 10.1371/journal.pone.0182651
37. Brandl EJ, Dietrich N, Mell N, Winkler J, Gutwinski S, Bretz J, et al. [Clinical and sociodemographic Differences between patients with and without Migration Background in a Psychiatric Outpatient Service]. *Psychiatr Prax.* (2018) 45:367–74. doi: 10.1055/s-0043-123735
38. Bell KM, Naugle AE. Effects of social desirability on students' self-reporting of partner abuse perpetration and victimization. *Violence Vict.* (2007) 22:243–56. doi: 10.1891/088667007780477348
39. Lim MH, Gleeson JF, Alvarez-Jimenez M, Penn DL. Loneliness in psychosis: a systematic review. *Soc Psychiatry Psychiatr Epidemiol.* (2018) 53:221–38. doi: 10.1007/s00127-018-1482-5
40. Hansson L. Determinants of quality of life in people with severe mental illness. *Acta Psychiatr Scand.* (2006) 113:46–50. doi: 10.1111/j.1600-0447.2005.00717.x
41. Sánchez J, Muller V, Chan F, Brooks JM, Iwanaga K, Tu WM, et al. Personal and environmental contextual factors as mediators between functional disability and quality of life in adults with serious mental illness: a cross-sectional analysis. *Qual Life Res.* (2019) 28:441–50. doi: 10.1007/s11136-018-2006-1

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 SW declared a shared affiliation, though no other collaboration, with the authors JM, JB, JW, SG, EB, MS-O, to the handling editor.

frontiers in Psychiatry

PERSPECTIVE
published: 07 July 2021
doi: 10.3389/fpsyt.2021.611108

Mental Health, Culture and Resilience—Approaching the COVID-19 Pandemic From a South African Perspective

Sibongile Mashaphu[1]*, *Mvuyiso Talatala*[2], *Sebolelo Seape*[2], *Lennart Eriksson*[1] and *Bonginkosi Chiliza*[1]

[1] *Department of Psychiatry, University of KwaZulu-Natal, Durban, South Africa,* [2] *Department of Psychiatry, University of the Witwatersrand, Johannesburg, South Africa*

It is understandable that the challenges of living through a severe contagious outbreak, like the coronavirus disease 2019 (COVID-19), cannot be tolerated for long and that some individuals may require emotional, psychological, and spiritual support in order to strengthen their resilience to navigate this difficult period. As clinicians and researchers in the field of mental health, we need to appreciate the roles that culture, spirituality, and religion play in comforting people who survive such an outbreak and provide possible solutions for public health authorities on how to promote wellness. This appreciation should direct us to seek a deeper understanding of how culture, spirituality, and religion can be used to endure an outbreak of this magnitude and how the interruption of common practices can impact the coping skills of those who are affected. Our understanding of the roles that customs, beliefs, and values of South Africans play in building resilience will help inform and strengthen interventions that are aimed at controlling the spread of COVID-19.

Keywords: COVID 19, spiritualty, resilience, religion, culture

Edited by:
Malek Bajbouj,
Charité – Universitätsmedizin Berlin, Germany

Reviewed by:
Marcelo Saad,
Albert Einstein Israelite Hospital, Brazil
Carrie Ashleigh Brooke-Sumner,
South African Medical Research Council, South Africa

***Correspondence:**
Sibongile Mashaphu
mashaphus@ukzn.ac.za

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *28 September 2020*
Accepted: *20 May 2021*
Published: *07 July 2021*

Citation:
Mashaphu S, Talatala M, Seape S, Eriksson L and Chiliza B (2021) Mental Health, Culture and Resilience—Approaching the COVID-19 Pandemic From a South African Perspective. Front. Psychiatry 12:611108. doi: 10.3389/fpsyt.2021.611108

INTRODUCTION

The coronavirus disease 2019 (COVID-19) is a high-impact widespread pandemic, with an imperfectly understood mode of transmission, poorly elucidated course, and a case fatality that has been ∼2% in South Africa (SA) and an estimated fatality rate of 5–20% worldwide, with country-specific rates varying from 0.5 to 3.6% (1–3). Frontline health workers and policy makers have been left perplexed by this disease with regard to its evolution over time and the treatment approaches. We, irrespective of age, gender, or background, are all affected by this so-called invisible enemy. The COVID-19 pandemic, in addition to the mortality and physical morbidity, poses threats to the mental health of the entire population. The disease was first identified in a wholesale market in Wuhan, China, in December 2019 and runs a particularly aggressive course in those with underlying comorbidities such as obesity, diabetes, hypertension, cardiac disease, renal disease, and cancer (4, 5). To this day, several millions of people worldwide have been infected, while a few millions have succumbed to this virus. COVID-19, compared to other epidemics such as HIV, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), Ebola, and H1N1, has run a more severe course because of a rapid spread that resulted in acute morbidity and mortality.

With the current reports of new mutations that may affect vaccine efficacy in several countries (6) and predictions of possible surges or waves in certain clusters, it is clear that this virus is likely to stay with us for some time. Therefore, non-pharmacological measures remain the most reliable long-term strategies to control the pandemic (7). In order to reduce the rate of transmission, the strictest measures of public health prevention and infection control are being applied. These measures include strict hygiene routines, self-isolation, quarantine, movement restriction, and social distancing, which were introduced on various communities by most governments with little consideration to the mental, social, physical, and economic preparedness of individuals and families (8). Several countries, including the UK and USA, have established procedures for psychological crisis interventions to deal with public health emergencies (9). Similarly, our country needs to develop similar guidelines that can be used to strengthen mental health initiatives during a time of crisis without fuelling the spread of the virus. Such protocols should be relevant to the local context because sociocultural practices are the distinctive spiritual material that characterizes a society as a social group (10).

In this paper, we explore the COVID-19 pandemic from a South African perspective by highlighting the impact of this pandemic on certain social norms and linking the important role of culture, spirituality, and religion in promoting mental health and resilience. Furthermore, we provide perspectives on how individuals and societies can be supported to continue to practice their spiritual and religious activities without breaking the prescribed guidelines.

THE PANDEMIC POSES CHALLENGES TO COMMON SPIRITUAL AND RELIGIOUS PRACTICES

The management of a patient with COVID-19 drastically deviates from how people have been accustomed to looking after those who are suffering from a medical illness. In SA, the regulations of the Disaster Management Act No. 57 of 2020 prohibit the visitation of the sick in hospital, thereby preventing any physical contact the families may have with those with COVID-19 (11). Families of hospitalized patients with COVID-19 and other illnesses do not get an opportunity to communicate with their loved ones even in times of imminent death, missing opportunities to practice rituals of dealing with those who are sick and dying that have been established over centuries. Even those who do not receive care in health facilities are subjected to strict quarantine and self-isolation for long periods of time (12).

COVID-19 deaths have been perceived by many as cold and inhumane in nature, forcing frontline workers to make quick decisions about end-of-life care while shielding vulnerable family members from getting the disease (13). The respondents of a UK-based study that was conducted on individuals who were bereaved during the pandemic highlighted the benefit of after-death rituals, including funeral attendance, as a meaningful way for the bereaved to pay their last respects (14). Visiting the sick, offering a prayer, and performing rituals for the sick and those who are dying are practices common to most societies, and abandoning these may result in complex bereavement issues, as described by some countries that experienced the pandemic before us (15–17). In the South African context, the practice of animistic and Christian rituals that have been passed down from generation to generation is believed to have a protective and emotionally uplifting role for the bereaved (18). The lockdown restrictions prohibit large gatherings, which means that some close friends and family members will not have the opportunity to mourn the loss of a loved one according to usual practices (19).

These restrictions forced our communities to find new ways to connect without violating the set restrictions. The use of virtual or online platforms turned out to be a plausible solution to this problem; however, in low and middle-income countries, resource limitations mean that many people do not have access to smartphones, Internet connectivity, or data. The WHO published guidelines on avoiding large faith group gatherings and encouraged conducting rituals and faith-related activities remotely or virtually (20), but the practical application of these guidelines remains to be established through research. In other countries such as the UK and Ireland, the non-contact ways of dealing with bereavement were assessed, and caution has been made to avoid the "tsunami of grief" by promoting support services for the bereaved (17). Events that are time-sensitive and cannot be postponed until the pandemic is under control, such as funerals, were performed under the new norms, but other cultural practices that are not time-sensitive may be postponed to a later time; for example, the winter schools for the rites of passage of initiation of boys to manhood were postponed to the summer season due to COVID-19[1]. Illegal practitioners of initiation schools have already taken advantage of this postponement and ran illegal schools. In the long term, there could be a psychological impact in boys who grow older and feel delayed in their passage to manhood[2].

PUBLIC HEALTH INFORMATION

The way in which most people have embraced the new social distancing norms without fully understanding the pathogenesis of this virus or experiencing it first hand is admirable. As of now, there is no definitive antiviral for this disease, but several vaccine candidates are being rolled out worldwide (21, 22). This implies that COVID-19 is one of those dreaded medical conditions that do not yet have a cure, but can be prevented by a combination of mass vaccination programs and non-pharmacological measures such as hand hygiene and social distancing. This may pose some serious challenges to those who strongly believe in divine interventions, fueling debates on science vs. spirituality in health-related matters, so to speak. In managing a pandemic, it is important to contextualize this point so that public health information is packaged in a way that is clear, accurate, and culturally sensitive in order to provide specific health promotion

---

[1] www.sanews.gov.za.

[2] https://www.groundup.org.za/article/covid-19-circumcision-schools-suspended-eastern-cape/.

TABLE 1 | Contrast between common social practices and COVID-19 regulations.

Cultural beliefs	COVID-19 regulations
Group activities	Social distance
Seeking closeness during illness	Self-isolation
Shaking hands	No touching
Unity in numbers	Staying away is caring
Washing of mortal remains	No contact with mortal remains

and disease prevention, more so when health guidelines strongly contradict normal cultural practices. For example, funerals and church gatherings that resulted in the spread of the infection during the first wave in the South African arm of the pandemic highlight the difficulties that communities have experienced in adapting to this "new normal" way of processing grief, but provided the public with some insights on how large gatherings fuel the spread of COVID 19[3]. Within the continent, the COVID-19 fight in Uganda demonstrated that religion and its institutions are instrumental in mobilizing citizens to abide by government programs, especially public health programs (20).

Table 1 shows the contrast between common cultural practices and the COVID-19 regulations. As clinicians and researchers in the field of mental health, it is imperative that we change the narrative to reaffirm that staying away from a funeral and reducing the number of attendees are the best forms of support you can show during these times. These health messages need to be consistent and evidence-based in order to provide the most updated scientific information that will promote adherence to the new regulations (23).

THE ROLE OF SPIRITUALITY AND RELIGION IN PROMOTING MENTAL HEALTH DURING A PANDEMIC

Spirituality and religion are an important resource for well-being. Many researchers have demonstrated that spirituality plays a significant role in the lives of people, their thoughts, and behaviors (24–26). Spirituality provides a framework of meaning for people in their daily lives, as well as during major life crises. Similarly, religious practices form part of the organized and institutional components of faith traditions, which are common to our society (27). In SA, taking part in religious, spiritual, and cultural rituals is generally done in groups. This is a normal social practice through which individuals experience a sense of cohesiveness and belonging, and restricting these may translate into loss of routine pleasurable social activities. For example, identified places where people usually access social support, like churches, schools, and sporting venues, have limited access during hard lockdowns. In a multicultural and ethnically diverse country like SA, there is bound to be a resultant breakdown and significant loss of the social support systems that promote resilience, thus making people susceptible to psychosocial distress and mental health problems.

According to indigenous knowledge systems, African spirituality has emphasized that life is interconnected and that, in order to be fully human, one needs to address the holistic development of a person's physical, mental, social, economic, and spiritual well-being (28). Social connections have thus been identified as a key platform wherein individuals are protected against changes to mental status and behavior (26). The enforcement of social distancing has led to alterations in connections with friends and family members, factors shown to be protective against mental health disorders and to foster resilience in the face of adversity. We can draw lessons from the concurrent HIV epidemic, which is running a parallel course with COVID-19 in SA. During the devastating spread of HIV, religious, spiritual, and cultural beliefs played a significant role in mitigating against mental health problems among sufferers, their families, and healthcare workers (29).

SUGGESTIONS FOR OVERCOMING THE CURRENT LIMITATIONS

According to media reports in SA, gatherings of large groups of people have been responsible for the majority of community spread, the so-called super spreader events[3]; e.g., the first outbreak in the Free State province occurred following a church gathering. The WHO has repeatedly cautioned that a pandemic like COVID-19 will not be defeated by only scaling up health facilities and resources but also through a change of behavior (20). Our communities have the responsibility to reduce the spread of this virus by following the non-pharmacological approaches that have been circulated on various public health platforms. Getting individuals to take responsibility for themselves for the good of everyone else is an important message to spread across our communities. The concept of *Ubuntu* (30), which is defined as humanness—a pervasive spirit of caring and community, harmony and hospitality, respect and responsiveness—that individuals and groups display for one another is strongly encouraged. An organizing concept of Ubuntu is human interdependence, and the driving norms are reciprocity, suppression of self-interest, and the virtue of symbiosis. These concepts can be used in specific conversations about the experiences of being exposed to a pandemic outbreak, with the aim of reinforcing the relational interactions between self-protection and community protection within a cultural context, like it was done in HIV prevention programs (31).

The issue of society, culture, and religious practices in a changing world deserves special mention within the African context, which is characterized by inequities and vulnerabilities. In adapting to the new norms, we should promote and use innovation to enhance social connection and ritual effectiveness, as was the case in Uganda (32). Many interesting developments have already transformed how rituals are performed, e.g., funerals are livestreamed, highlighting the value of using technology for establishing connection during religious services and funerals. Sadly, in most African communities, access to technology and

---

[3] www.healthline.com>health-news.

TABLE 2 | Applying the concept of Ubuntu in response to a pandemic.

Concept of Ubuntu and the Nguzo-Saba principles	Application in response to a pandemic
Unity	Encourage others to adhere to social distancing. Support others from a distance. Do not stigmatize those with COVID 19 symptoms.
Self-determination	We all have a role to play in stopping the pandemic. Wear a mask when in public. Adhere to social distancing. Protect the vulnerable individuals. Disclose your symptoms.
Collective work and responsibility	Share essential resources, such as water, face masks, and hand sanitizers. Protect your family. Protect your colleagues. Protect your community. Save lives. Take the vaccine.
Cooperative economics	Sharing of resources. Allocating more resources to vulnerable individuals.
Purpose	To work together toward a common goal to end the pandemic.
Creativity	Use innovative ways to connect. Use technology to provide essential services.
Faith	The virus shall be defeated if we all play our part.

other resources that are required to promote these new initiatives is not available due to resource constraints as well as social and racial inequalities. The recommendations published by the WHO encourage the use of virtual platforms, but how these ideas should be operationalized in resource-constrained settings remains to be established through research (20).

We have borrowed from the West African culture the principles of Nguzo-Saba (unity, self-determination, collective work and responsibility, cooperative economics, purpose, creativity, and faith), which have been repeatedly used in public health interventions such as HIV to motivate behavior changes in order to prevent the spread of the virus within communities (33). Using the same principles, aligned with the basic concept of Ubuntu, we propose a model to utilize as a public health tool that clearly defines the culturally relevant role of each individual toward reducing the spread of COVID-19. **Table 2** below shows the application of the concept of Ubuntu in reducing the spread of COVID-19, which can be used to shape public health messages. It is anticipated that when the large-scale rollout of vaccines occurs, further, challenges will be experienced in terms of the distribution to our large population. Health authorities have published clear guidelines of the vaccine rollout plans, starting with our most vulnerable populations and frontline workers, but in South Africa, there have been anecdotal reports of vaccine fraud among healthy individuals who had the vaccine before their turn (34). This process will require the application of some of the Ubuntu concepts and principles, where individuals with no vulnerabilities will receive the vaccine at a later stage, and vaccine hesitancy can be discouraged in the same manner. Moreover, the rollout of the vaccine depends on technology, with registrations taking place online. It is through the application of the same Ubuntu principles that we can encourage individuals to support those who are unable to use these technologies or have no access to such so that they are not left out.

HIGHLIGHTING IMPORTANT RESEARCH ISSUES

A large number of questions remain unanswered because the virus has only been around for a short period of time and the long-term effects of social isolation are yet to be experienced and reported on. Going forward, it will be interesting to look into the sustainability of the new norm and to observe whether people will return to the old ways of doing things when the pandemic is over. The interconnections of life appear more overtly during cultural rituals, such as birth rites, coming-of-age ceremonies, weddings, and funerals, than at any other times, and any noticeable changes in these practices should be duly documented because animistic rituals are intergenerational and may become fluid and change with time (35). At times like these, when change is forced upon the entire population, opportunities may arise for us to explore our indigenous knowledge systems for fluidity, flexibility, and resilience.

CONCLUSION

This pandemic has no end in sight yet, and according to the WHO, the earliest we are likely to go back to normal practices will be in the middle of the year 2022. In the meantime, we need to adapt and thrive under the new normal living conditions by promoting social, spiritual, and cultural activities while conforming to the stipulated COVID-19 guidelines.

DATA AVAILABILITY STATEMENT

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

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

FUNDING

This study was supported by the University of KwaZulu-Natal College of Health Sciences.

ACKNOWLEDGMENTS

This manuscript originated following a discussion with Dr. Gail E. Wyatt, who co-authored a manuscript titled: *Mental Health*

Ramifications of the COVID-19 Pandemic for Black Americans: Clinical and Research Recommendations. He suggested that we look into the challenges brought about by the pandemic within our cultural context. Secondly, we wish to acknowledge the contribution of the reviewers who provided a critique of the manuscript that helped strengthen it significantly.

REFERENCES

1. Rajgor DD, Lee MH, Archuleta S, Bagdasarian N, Quek SC. The many estimates of the COVID-19 case fatality rate. *Lancet Infect Dis.* (2020) 20:776–7. doi: 10.1016/S1473-3099(20)30244-9
2. Kenyon C. Flattening-the-curve associated with reduced COVID-19 case fatality rates-an ecological analysis of 65 countries. *J Infect.* (2020) 81:e98–9. doi: 10.1016/j.jinf.2020.04.007
3. Baud D, Qi X, Nielsen-Saines K, Musso D, Pomar L, Favre G. Real estimates of mortality following COVID-19 infection. *Lancet Infect Dis.*. (2020) 20:773. doi: 10.1016/S1473-3099(20)30195-X
4. Singh AK, Gillies CL, Singh R, Singh A, Chudasama Y, Coles B, et al. Prevalence of co-morbidities and their association with mortality in patients with COVID-19: a systematic review and meta-analysis. *Diabet Obes Metabol.* (2020) 22:1915–24. doi: 10.1111/dom.14124
5. Asfahan S, Deokar K, Dutt N, Niwas R, Jain P, Agarwal M. Extrapolation of mortality in COVID-19: Exploring the role of age, sex, co-morbidities and health-care related occupation. *Monaldi Arch Chest Dis.* (2020) 90:313–17. doi: 10.4081/monaldi.2020.1325
6. Koyama T, Weeraratne D, Snowdon JL, Parida L. Emergence of drift variants that may affect COVID-19 vaccine development and antibody treatment. *Pathogens.* (2020) 9:324. doi: 10.3390/pathogens9050324
7. Chowdhury R, Luhar S, Khan N, Choudhury SR, Matin I, Franco OH. Long-term strategies to control COVID-19 in low and middle-income countries: an options overview of community-based, non-pharmacological interventions. *Eur J Epidemiol.* (2020) 35:743–8. doi: 10.1007/s10654-020-00660-1
8. Lewnard JA, Lo NC. Scientific and ethical basis for social-distancing interventions against COVID-19. *Lancet Infect Dis.* (2020) 20:631. doi: 10.1016/S1473-3099(20)30190-0
9. Roberts AR. *Crisis Intervention Handbook: Assessment, Treatment, and Research.* New York, NY: Oxford University Press (2005).
10. Mapaya MG, Mugovhani NG. African funeral ceremonies as African humanism in action. *Anthropologist.* (2014) 17:911–6. doi: 10.1080/09720073.2014.11891506
11. Department of Co-operative Governance and Traditional Affairs. *Disaster Management Act: Regulations to Address, Prevent and Combat the Spread of Coronavirus COVID-19*. Pretoria: Department of Co-operative Governance and Traditional Affairs (2020).
12. Cimolai N. More data are required for incubation period, infectivity, and quarantine duration for COVID-19. *Travel Med Infect Dis.* (2020) 37: 101713. doi: 10.1016/j.tmaid.2020.101713
13. Moore K, Sampson E, Kupeli N, Davies N. Supporting families in end-of-life care and bereavement in the COVID-19 era. *Int Psychogeriatr.* (2020) 32:1245–8. doi: 10.1017/S1041610220000745
14. Burrell A, Selman LE. How do funeral practices impact bereaved relatives' mental health, grief and bereavement? A mixed methods review with implications for COVID-19. *OMEGA*. (2020) 1–39. doi: 10.1177/0030222820941296
15. Zhai Y, Du X. Loss and grief amidst COVID-19: a path to adaptation and resilience. *Brain Behav Immun.* (2020) 87:80–1. doi: 10.1016/j.bbi.2020.04.053
16. Bertuccio RF, Runion MC. Considering grief in mental health outcomes of COVID-19. *Psychol Trauma.* (2020) 12:S87–89. doi: 10.1037/tra0000723
17. Pearce C, Honey JR, Lovick R, Creamer NZ, Henry C, Langford A, et al. "A silent epidemic of grief": a survey of bereavement care provision in the UK and Ireland during the COVID-19 pandemic. *BMJ Open.* (2021) 11:e046872. doi: 10.1136/bmjopen-2020-046872
18. Rooney C, Staff RC. *African Literature, Animism and Politics*. Oxfordshire: Routledge (2000).
19. Disaster Management Act. *Regulations to Address, Prevent and Combat the Spread of Coronavirus COVID-19*. Amendment (2020).
20. World Health Organization. *Practical Considerations and Recommendations for Religious Leaders and Faith-Based Communities in the Context of COVID-19: Interim Guidance*. Geneva: World Health Organization (2020).
21. Baraniuk C. Covid-19: how the UK vaccine rollout delivered success, so far. *BMJ.* (2021) 372:n421. doi: 10.1136/bmj.n421
22. Felter C. What to Know About the Global COVID-19 Vaccine Rollout So Far. Council on Foreign Relations (2021).
23. Thompkins F Jr, Goldblum P, Lai T, Hansell T, Barclay A, Brown LM. A culturally specific mental health and spirituality approach for African Americans facing the COVID-19 pandemic. *Psychol Trauma.* (2020) 12:455–6. doi: 10.1037/tra0000841
24. Evans D. *Spirituality and Human Nature*. SUNY Press (1993).
25. Spaniol L. Spirituality and connectedness. *Psychiatr Rehabil J.* (2002) 25:321–2. doi: 10.1037/h0095006
26. Lázár I. Spirituality and human ecosystems. *Spiritual Ethics Manag.* (2011) 19:95–105. doi: 10.1007/978-94-007-1153-2_6
27. Oman D. Defining religion and spirituality. *Handb Psychol Relig Spiritual.* (2013) 2:23–47.
28. Ntuli PP. *Indigenous Knowledge Systems and the African Renaissance. Indigenous Knowledge and the Integration of Knowledge Systems*. (2002). p. 53–66.
29. Szaflarski M. Spirituality and religion among HIV-infected individuals. *Curr HIV/AIDS Rep.* (2013) 10:324–32. doi: 10.1007/s11904-013-0175-7
30. Nussbaum B. African culture and Ubuntu. *Perspectives.* (2003) 17:1–12.
31. Oman D. Defining religion and spirituality. In: Paloutzian RF, Park CL, editors. *Handbook of the Psychology of Religion and Spirituality*. New York, NY: The Guilford Press (2013). p. 23–47.
32. Isiko AP. Religious construction of disease: an exploratory appraisal of religious responses to the COVID-19 pandemic in Uganda. *J Afr Stud Dev.* (2020) 12:77–96. doi: 10.5897/JASD2020.0573
33. El-Bassel N, Jemmott JB, Landis JR, Pequegnat W, Wingood GM, Wyatt GE, et al. National Institute of Mental Health multisite Eban HIV/STD prevention intervention for African American HIV serodiscordant couples: a cluster randomized trial. *Arch Intern Med.* (2010) 170:1594–601. doi: 10.1001/archinternmed.2010.261
34. Mulberry N, Tupper P, Kirwin E, McCabe C, Colijn C. Vaccine rollout strategies: the case for vaccinating essential workers early. *medRxiv.* (2021) 1–31. doi: 10.1101/2021.02.23.21252309
35. Van Rheenen G. *Defining an Animistic Worldview*. Ulaanbaatar: Missiology (2003).

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 13 July 2021
doi: 10.3389/fpsyt.2021.642618

Mental Health Self-Stigma of Syrian Refugees With Posttraumatic Stress Symptoms: Investigating Sociodemographic and Psychopathological Correlates

Jonathan Bär[1†], *Alexander Pabst*[1*†], *Susanne Röhr*[1,2], *Melanie Luppa*[1], *Anna Renner*[3], *Michaela Nagl*[3], *Judith Dams*[4], *Thomas Grochtdreis*[4], *Anette Kersting*[3], *Hans-Helmut König*[4] and *Steffi G. Riedel-Heller*[1]

[1] Institute of Social Medicine, Occupational Health and Public Health, University of Leipzig (ISAP), Leipzig, Germany, [2] Global Brain Health Institute, Trinity College Dublin, Dublin, Ireland, [3] Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Leipzig, Leipzig, Germany, [4] Department of Health Economics and Health Services Research, Hamburg Center for Health Economics, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Edited by:
Tam Thi Minh Ta,
Charité - University Medicine
Berlin, Germany

Reviewed by:
Markus Stingl,
University of Giessen, Germany
Marion C. Aichberger,
Humboldt-Universität zu
Berlin, Germany

***Correspondence:**
Alexander Pabst
Alexander.Pabst@
medizin.uni-leipzig.de

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

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Psychiatry

Received: *16 December 2020*
Accepted: *10 June 2021*
Published: *13 July 2021*

Citation:
Bär J, Pabst A, Röhr S, Luppa M, Renner A, Nagl M, Dams J, Grochtdreis T, Kersting A, König H-H and Riedel-Heller SG (2021) Mental Health Self-Stigma of Syrian Refugees With Posttraumatic Stress Symptoms: Investigating Sociodemographic and Psychopathological Correlates. Front. Psychiatry 12:642618. doi: 10.3389/fpsyt.2021.642618

Background: The high prevalence of mental disorders related to posttraumatic stress among Syrian refugees is often in contrast with their low utilization of mental health care in the host countries. Mental health self-stigma, i.e., internalized stigma of having a mental disorder, could prevent individuals from seeking mental health care. Therefore, we aimed to provide evidence on different aspects of mental health self-stigmatization among adult Syrian refugees with posttraumatic stress symptoms residing in Germany. Moreover, we investigated associations with sociodemographic and psychopathological variables in order to identify those at higher risk of self-stigmatization.

Material and Methods: Overall, 133 participants with mild to moderate posttraumatic stress symptoms were recruited in the metropolitan areas of Leipzig, Dresden and Halle, Germany, using a multimodal approach. Mental health self-stigma was assessed using the Self-Stigma of Mental Illness Scale – Short Form (SSMIS-SF), consisting of four subscales (*Stereotype awareness*, *Stereotype agreement*, *Application to self*, *Harm to self-esteem*), each scoring from 5 (low) to 45 (high) points. Linear regression analysis was used to test associations of sociodemographic and psychopathological variables with self-stigma subscales.

Results: On average, self-stigma ratings ranged from 16.5 (SD = 6.6) points on *Application to self* to 28.3 (SD = 7.5) points on *Stereotype awareness*. Results showed higher scores on *Application to self* for individuals who were younger ($t = 2.65$, $p = 0.009$) and single ($F = 5.70$, $p = 0.004$). Regression analyses yielded statistically significant associations between having multiple comorbidities and a higher *Application to self* stigma ($\beta = 0.18$, $p = 0.044$), controlling for sociodemographic covariates.

Discussion: Mental health self-stigma was increased among Syrian refugees in Germany. Correlates of increased self-stigma could inform efforts to improve access to mental health care among Syrian refugees with mental ill-health. Longitudinal studies following an intersectional approach by concurrently examining multiple forms of public and internalized stigma could provide helpful insights for developing tailored stigma reduction efforts in this context.

Keywords: self-stigma, mental health, Syrian refugees, posttraumatic stress, comorbidity

INTRODUCTION

Around the globe, the number of individuals forcibly displaced from their homes due to persecution, violence, conflict and human rights violations has risen to 79.5 million by the end of 2019 (1). Germany has been a major host for refugees for many years now, especially for individuals from Syria (2). Since the beginning of the civil war in Syria in 2011, around 790,000 refugees have sought protection in Germany (3). Upon arrival in a host country, refugees can be confronted with a multitude of post-migration stressors, such as insecure residential status, language barriers or the loss of social contacts (4). As a consequence of the distressing experiences before, during and after the escape from the origin country, a substantial proportion of individuals seeking asylum often experience posttraumatic stress and related mental ill-health. A study on mental health in Syrian refugees residing in Germany found that more than 30% met the criteria for at least one mental disorder (5). In contrast to the corresponding treatment needs, a recent systematic review showed a strong underutilization of mental health care in refugees and asylum seekers in European countries (6). Besides structural barriers in accessing health care (e.g., unstable living conditions, financial strain, language barriers), stigma related to mental health is considered to be a major barrier to help-seeking in refugee populations (7).

Sociologist Erving Goffman defined stigma as an "attribute that is deeply discrediting," resulting in the "situation of the individual who is disqualified from full social acceptance" (8). Departing from Goffman's introduction of the stigma concept to the social sciences, different definitions and dimensions of stigma and the process of stigmatization have been discussed (9). In the context of stigma related to mental health, often denoted as mental illness stigma or mental health stigma, two fundamental dimensions of stigma have been differentiated: public stigma and self-stigma (10). Public stigma represents the stereotypes, prejudice and discrimination that society places on the stigmatized group. Self-stigma, in turn, denotes the internalization of the public stigma among individuals belonging to the stigmatized group. Corrigan and colleagues (11, 12) have described self-stigmatization as a process following four consecutive and interrelated stages: (I) awareness of stereotypes existing in the general public (i.e., perceived public stigma), (II) agreement to those stereotypes, (III) applying the stereotypes to oneself, and (IV) the consequent experience of harm as a decrement of self-esteem. Two central assumptions of this progressive model of self-stigma are: the trickle-down nature of the self-stigmatization process (with lower scores for each subsequent stage) and larger correlations between more proximal than between more distal stages. Testing these assumptions in different diagnostic groups (e.g., patients with serious mental illness, patients with addictive disorders) yielded mixed evidence, from confirming both assumptions to differences between "earlier" and "later" stages, but not between each of the four individual stages (12–15).

The process of internalizing negative views among individuals with mental ill-health can have detrimental psychosocial effects (see **Figure 1**). For example, mental health self-stigmatization has been found to be associated with more severe psychopathological symptoms and lower treatment adherence (17), a sense of futility or "why try" effect (16) and suicidal ideation (18). Refugees with mental ill-health could be particularly vulnerable in this respect as they might experience intersecting stigmata, both as mentally ill and as potentially marginalized group in the host country (19). Despite the apparent gap between mental health care needs and actual utilization, the self-stigma of refugees experiencing posttraumatic stress is poorly understood. Research on self-stigma of individuals with posttraumatic stress symptoms has largely focused on veteran samples (20), with limited comparability to traumatic experiences and associated self-stigmatizing beliefs of specific refugee groups. Culture-dependent variations in correlates of mental health self-stigma have been previously reported (21), yet relations between cultural factors and mental health self-stigma remain unclear (22). In this regard, researchers have also pointed out an underrepresentation of individuals from Arabic countries in psychological research (23).

As for Syrian individuals with mental ill-health, the few existing studies suggest a high level of stigma related to undergoing specialized mental health treatments and receiving a mental disorder diagnosis. For example, Hassan and colleagues (24) have pointed out that being labeled as mentally ill in Syria bears the risk of being viewed as "mad" or "crazy," which tends to be associated with concerns about bringing shame to oneself and one's family. Similar attitudes of the general public in Syria were reported in a recent qualitative study based on focus groups of Syrian refugees residing in Germany (25). The findings also confirmed strongly stigmatizing views about seeking help from mental health professionals. To date, it is an unresolved question how these stigmatizing beliefs in the general public in Syria translate to self-stigmatization of Syrian refugees with posttraumatic stress symptoms residing in Germany. To the best of our knowledge, no previous study has examined the applicability of the progressive model of self-stigma (11, 12) neither for individuals with posttraumatic stress symptoms nor refugee samples. In light of this lack of evidence, further improving our understanding of characteristics and correlates of mental health self-stigmatization within this group seems imperative.

Against this background, we aimed to provide an explorative analysis of mental health self-stigma among adult Syrian refugees with mild to moderate posttraumatic stress symptoms residing in Germany, drawing on cross-sectional baseline data from the *Sanadak* trial (26). The *Sanadak* trial comprised the development and evaluation of a low-threshold Arabic-language self-help app for posttraumatic stress, targeting Syrian refugees residing in Germany. Our objectives were: (I) to describe the level of mental health self-stigma among Syrian refugees according to the progressive model of self-stigma, (II) to investigate possible differences in mental health self-stigma according to age, gender, education and family status, and (III) to determine whether individuals were more prone to self-stigmatization if they had more psychopathological comorbidities. Based on our findings, we aimed to inform the development of adapted stigma reduction efforts and of urgently needed multidisciplinary (legal, psychosocial) support options for refugees in Germany and other host countries (4).

MATERIALS AND METHODS

Recruitment

Participants of the *Sanadak* trial were recruited in Leipzig, Dresden and Halle, Germany, following a multimodal approach (e.g., through multipliers working with Syrian refugees or personal contacts of study nurses) between October 2018 and December 2019. A detailed description of recruitment procedures is given elsewhere (27). Potential participants were invited to a screening interview assessing eligibility criteria as follows: (I) Syrian refugees residing in Germany, (II) 18–65 years old, (III) experienced at least one traumatic event and reported subsequent mild to moderate posttraumatic stress symptom severity (Posttraumatic Diagnostic Scale for DSM-5, PDS-5 total score $= 11–59$) (28) and (IV) owning a device compatible with the app (Android/iOS). Exclusion criteria were (I) posttraumatic stress symptom severity beyond the range stated above, (II) severe depressive symptoms (Patient Health Questionnaire, PHQ-9 total score ≥ 20) (29), (III) acute suicidal tendencies (Depressive Symptom Inventory-Suicidality Subscale, DSI-SS total score ≥ 3) (30), (IV) current psychotherapy/psychiatric treatment and/or psychotropic medication, as well as (V) females being pregnant. If study eligibility was not fulfilled, individuals were provided with psychoeducation material on mental health care and contact information of local initiatives offering face-to-face support. Five individuals scored slightly above the cutoff for suicidality on the DSI-SS. However, they were included in the study based on their overall clinical impression and ensuring no intention to act. This decision was reached in consensus conferences including study nurses and study psychologists.

Measures

A detailed overview of the measures implemented in the *Sanadak* trial and the procedure of translation to Arabic (if measures were not available in Arabic) is provided in the study protocol (26). All assessments were in Arabic and took place in the form of structured face-to-face interviews with trained study nurses who were native speakers. The screening assessment included, among others, questions on sociodemographic data and further eligibility criteria outlined above. Upon trial inclusion, participants completed a comprehensive baseline assessment, covering measures of self-stigma and psychopathological symptoms.

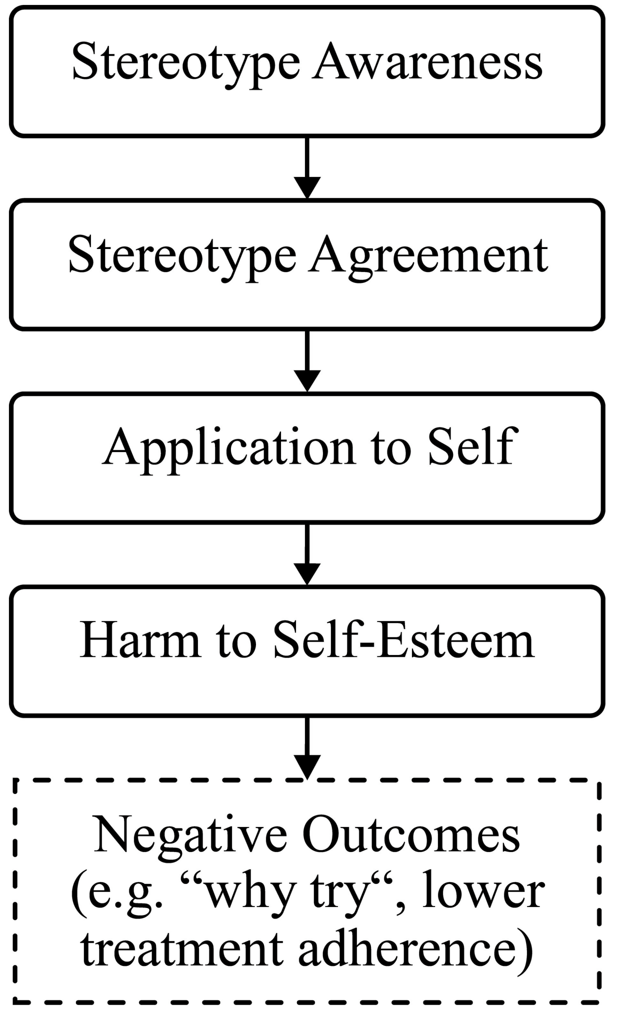


FIGURE 1 | Progressive model of self-stigma (adapted from Corrigan et al. (16)).

Mental health self-stigma was assessed using the Self-Stigma of Mental Illness Scale – Short Form (SSMIS-SF) (12). The SSMIS-SF comprises 20 items rated on a 9-point scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). There are four subscales, each consisting of four 5-items, which represent consecutive stages in the stigma internalization process: stereotype awareness (*Aware*), stereotype agreement (*Agree*), application to self (*Apply*), and harm to self-esteem (*Harm*). Examples of items are "I think the public believes … most people with mental illness are to blame for their problems" (subscale *Aware*), "I think … most people with a mental illness cannot take care of themselves" (subscale *Agree*), "Because I have a mental illness … I am dangerous" (subscale *Apply*), or "I currently respect myself less because … I am unpredictable" (subscale *Harm*). Sum scores were calculated for each of the subscales, with a possible range of 5 (low level of self-stigma) to 45 (high level of self-stigma). Good reliability and validity have been demonstrated for the SSMIS-SF (12).

Psychopathological comorbidities (depression, generalized anxiety, somatization) were determined according to scores of the Patient Health Questionnaire – Depression Module (PHQ-9) (29), the Generalized Anxiety Disorder Scale (GAD-7) (31) and the Patient Health Questionnaire – Somatic Symptom Module (PHQ-15) (32). We used a cutoff of $\geq$ 10 to indicate clinically significant symptom severity for all three measures (29, 31, 32).

Statistical Analyses

Statistical analyses were performed in R, version 3.6.3 (33) with RStudio, version 1.3.1056 (34). Descriptive statistics were expressed as absolute numbers, percentages or means with standard deviations. Correlations between self-stigma subscales were calculated as Pearson's r bivariate correlation coefficients using pairwise complete observations. Differences between the four self-stigma subscales were tested using one-way repeated measures analysis of variance (ANOVA), which is in line with previous investigations of the progressive model of self-stigmatization based on cross-sectional data (12). In order to assess self-stigma differences between sociodemographic and psychopathological groups, we used independent samples t-tests or, in the case of more than two categories, one-way ANOVA. We performed multiple linear regression analyses to test whether a higher number of comorbidities predicted self-stigma scores. We applied a cutoff of $\geq$2 to indicate higher comorbidity, given that previous research yielded the strongest associations with mental health stigma for multiple comorbidities (35). Regression models were adjusted for age, gender and school-based education. Distribution assumptions for linear models were not violated. All analyses were based on a significance level of $\alpha = 0.05$.

RESULTS

Sample Description

Table 1 shows sociodemographic characteristics of the analysis sample ($N = 133$). The majority of participants were male, single, had a high degree of school education and not more than one psychopathological comorbidity. The age of participants in the analysis sample ranged from 18 to 64 years. Mean posttraumatic stress symptom level (PDS-5) according to the screening assessment was 24.4 ($SD = 11.1$).

Mental Health Self-Stigma Scores

Table 2 shows the mental health self-stigma scores in the analysis sample. One-way repeated measures ANOVA for stigma subscales was statistically significant [$F_{(2.5,330.6)} = 73.526$, $p < 0.001$, $\eta^2_p = 0.361$]. *Post-hoc* tests with Bonferroni-corrected p-values yielded significantly higher scores on *Stereotype awareness* than the other three subscales ($p < 0.001$), and significant differences between higher *Stereotype agreement* and lower *Application to self* ($p = 0.007$). Correlations between self-stigma subscales are shown in **Table 3**. While scores were not lower for each subsequent stage of self-stigmatization, correlations were higher between more proximate vs. more distal stages of self-stigmatization.

TABLE 1 | Sociodemographic characteristics of the analysis sample ($N = 133$).

Variable	
Age (years): *M (SD)*	33.3 (11.2)
Gender	
Female	51 (38.3)
Male	82 (61.6)
Education (school-based)[a]	
<12 years	37 (28.2)
≥12 years	94 (71.8)
Family status[b]	
Single	69 (53.1)
Married	51 (39.2)
Divorced/Widowed	10 (7.7)
Number of comorbidities	
≤1	75 (56.4)
≥2	58 (43.6)

Entries are n (%) unless indicated differently. M, mean; SD, standard deviation.
[a]Missing data: n = 2, not included.
[b]Missing data: n = 3, not included.

TABLE 2 | Mental health self-stigma scores in the analysis sample ($N = 133$).

Variable	Range	*M (SD)*
Self-stigma (SSMIS-SF)		
Stereotype awareness[a]	11–45	28.32 (7.48)
Stereotype agreement[b]	5–38	18.82 (6.73)
Application to self[a]	5–39	16.52 (6.60)
Harm to self-esteem[a]	5–43	18.58 (9.52)

Possible range for SSMIS-SF subscales: 5–45; higher values indicate higher self-stigma; M, mean; SD, standard deviation. [a]Missing data: n = 1, not included.
[b]Missing data: n = 2, not included.

TABLE 3 | Pearson's r bivariate correlation matrix for SSMIS-SF subscales.

Variable	1.	2.	3.	4.
1. Stereotype awareness	1.00			
2. Stereotype agreement	0.18*	1.00		
3. Application to self	0.09	0.33***	1.00	
4. Harm to self-esteem	0.01	0.13	0.38***	1.00

$^*p < 0.05$, $^{***}p < 0.001$.

TABLE 4 | Means and standard deviations of mental health self-stigma scores according to sociodemographic characteristics.

	SSMIS-SF subscales			
Variable	**Stereotype awareness**	**Stereotype agreement**	**Application to self**	**Harm to self-esteem**
Age groups				
18–39 years ($n = 99$)	28.64 (7.28)	18.60 (6.53)^{a}	17.37 (6.61)	19.16 (9.40)
40–64 years ($n = 34$)	27.36 (8.10)^{a}	19.45 (7.36)^{a}	13.94 (5.95)^{a}	16.85 (9.70)^{a}
t-test statistics	$t_{(130)} = 0.85$, $p = 0.399$	$t_{(129)} = -0.63$, $p = 0.531$	$t_{(130)} = 2.65$, $p = 0.009^{**}$	$t_{(130)} = 1.21$, $p = 0.228$
Gender				
Female ($n = 51$)	28.86 (7.60)^{a}	18.60 (6.95)^{a}	16.24 (6.20)^{a}	19.44 (8.64)^{a}
Male ($n = 82$)	27.99 (7.44)	18.95 (6.63)^{a}	16.68 (6.86)	18.06 (10.03)
t-test statistics	$t_{(130)} = -0.65$, $p = 0.518$	$t_{(129)} = 0.29$, $p = 0.773$	$t_{(130)} = 0.37$, $p = 0.710$	$t_{(130)} = -0.81$, $p = 0.422$
Education (school-based)^{b}				
<12 years ($n = 37$)	27.75 (7.41)^{a}	19.60 (6.54)^{b}	16.72 (6.31)^{a}	17.11 (8.55)^{a}
≥12 years ($n = 94$)	28.41 (7.57)	18.47 (6.86)	16.47 (6.79)	19.00 (9.90)
t-test statistics	$t_{(128)} = -0.45$, $p = 0.653$	$t_{(127)} = 0.84$, $p = 0.400$	$t_{(128)} = 0.19$, $p = 0.846$	$t_{(128)} = -1.01$, $p = 0.315$
Family status^{c}				
Single ($n = 69$)	29.20 (6.91)^{a}	19.78 (6.28)	18.17 (7.03)	19.20 (10.21)
Married ($n = 51$)	27.68 (7.68)^{a}	17.66 (7.20)^{a}	14.16 (5.28)^{a}	17.38 (8.51)^{a}
Divorced/Widowed ($n = 10$)	26.40 (9.64)	18.30 (7.90)	15.90 (7.26)	19.70 (10.35)
One-way ANOVA statistics	$F_{(2,126)} = 1.00$, $p = 0.372$	$F_{(2,125)} = 1.44$, $p = 0.241$	$F_{(2,126)} = 5.7$, $p = 0.004^{**}$	$F_{(2,126)} = 0.60$, $p = 0.548$

Possible range for SSMIS-SF subscales: 5–45; higher values indicate higher self-stigma. $^{**}p < 0.01$, $^{***}p < 0.001$. ^{a}*Missing data:* $n = 1$, *not included.*

^{b}*Missing data:* $n = 2$, *not included.*

^{c}*Missing data:* $n = 3$, *not included.*

Associations of Sociodemographic Characteristics and Mental Health Self-Stigma

Univariate comparisons of mental health self-stigma scores across age groups, gender, education and family status are displayed in **Table 4**. Testing for differences between younger (18–39 years) and older (40–64 years) age groups yielded significantly lower *Application to self* scores for older vs. younger individuals (Cohen's $d = 0.53$). Testing for gender and education differences on self-stigma yielded no significant results. *Post-hoc* tests with Bonferroni-adjusted *p*-values yielded significantly higher *Application to self* scores for single vs. married participants ($p = 0.003$).

Associations of Psychopathological Comorbidities and Mental Health Self-Stigma

Self-stigma subscales between individuals with different numbers of comorbidities (see **Figure 2**) were not statistically significantly different. Multivariate linear regression analyses with mental health self-stigma scores as outcomes (see **Table 5**) yielded no significant associations of number of comorbidities with *Stereotype awareness* and *Harm to self-esteem*. Being married (in reference to being single) was significantly associated with lower scores on *Stereotype agreement*. In addition, higher age was significantly associated with lower scores on *Application to self*, whereas having ≥2 psychopathological comorbidities (in reference to ≤1 comorbidity) was significantly associated with higher scores on that subscale.

DISCUSSION

The study aim was to investigate mental health self-stigma and to investigate its associations with sociodemographic and psychopathological characteristics in a sample of adult Syrian refugees with mild to moderate posttraumatic stress symptoms residing in Germany. Forty-four percent of participants in our sample had multiple psychopathological comorbidities. Our results showed higher scores on *Application to self* for individuals who were younger and single, respectively. Moreover, regression analyses yielded significant associations between having multiple comorbidities and higher *Application to self*, controlling for sociodemographic covariates (age, gender, education).

Mental Health Self-Stigma in the Sanadak Sample

The scores on the four subscales of mental health self-stigma in the current sample broadly aligned with results from clinical non-refugee samples based on the same measure (12, 16, 36). Due to differences in study samples, however, the comparability to our findings is limited. To our knowledge, our work is the first to apply the SSMIS-SF in a refugee sample and further evidence is needed in order to draw conclusions on the severity of mental health self-stigma in different refugee populations. Using the *Brief Version of the Internalized Stigma of Mental Illness Scale* (ISMI-10) (37), a recent study reported mild mental health self-stigma in a sample of Arabic-speaking (predominantly Syrian) refugee outpatients with depressive symptoms in Germany (38). The authors argued that these findings might reflect sampling bias, since participants had already taken the step to seek mental

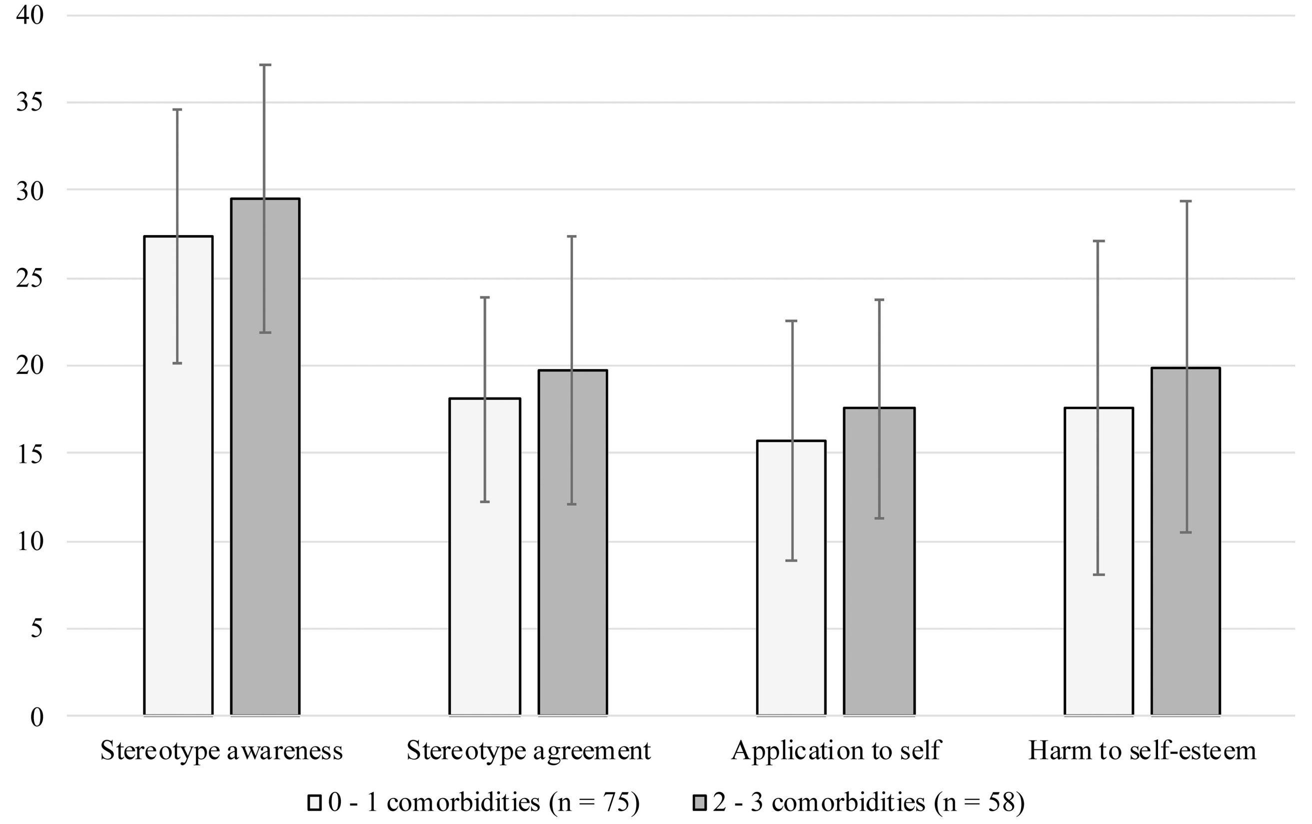


FIGURE 2 | Mental health self-stigma scores (means and standard deviations) according to number of comorbidities.

health treatment. These limitations also apply to our sample, considering that the *Sanadak* self-help app is a form of mental health treatment. Thus, our findings might underestimate the true extent of mental health self-stigma among Syrian refugees in Germany. In particular, the level of self-stigma may be higher among those who avoid treatment. Evidence from representative samples is needed in order to draw firm conclusions on this issue. It should also be noted here that the SSMIS-SF items for perceived public stigma (*Stereotype awareness*) might be more difficult to interpret in the case of refugees who have left the societal context that they grew up in and have entered a different cultural and societal sphere in the host country.

Compared to *Stereotype awareness,* our results showed significantly lower scores for the three subsequent stages (*Stereotype agreement*, *Application to self*, *Harm to self-esteem*) in the self-stigmatization process (see **Figure 1**). Another hypothesized contrast occurred between *Stereotype agreement* (higher) and *Application to self* (lower). However, scores for *Harm to self-esteem* were not significantly different compared to the preceding two stages. Similar to our findings, previous examinations of the model have yielded inconsistent patterns. For example, Corrigan et al. (12) reported the contrast between the first and the subsequent three stages as the only one consistent difference across three previous studies. A more recent study found differences between, but not within, the first two and the last two stages (13). Other results fully confirmed the assumed trickle down pattern, with significantly lower scores for each subsequent stage in a sample of patients with alcohol dependence (15). Yet, it should be noted that this latter study did not use the 20-item SSMIS-SF, but an adapted version of the 36-item SSMIS (11). In line with the second model assumption and previous findings (12, 13, 15), correlations between more proximate vs. more distal stages of self-stigmatization were higher in the present study. Correlations were strongest between adjacent stages (*Stereotype awareness – Stereotype agreement; Stereotype agreement – Application to self; Application to self – Harm to self*-esteem) and weakest between the most distant stages (*Stereotype awareness – Harm to self-esteem*).

Similar to existing studies, our findings indicated a differentiation between higher perceived public stigma and lower self-stigma, as well as higher correlations between more proximal stages of self-stigmatization. In light of inconclusive evidence, the assumption of a trickle-down process with decreasing self-stigma along the postulated four stages requires further empirical testing and corresponding refinement. The underlying idea of stigma internalization as a progression from public stigma to self-stigma is, however,

TABLE 5 | Results of multiple linear regression analyses for predicting mental health self-stigma.

Variable	*b*	95% CI	β	*p*
Stereotype awareness (n = 127): R^2 = 0.051, adjusted R^2 = 0.003, $F_{(6,\ 120)}$ = 1.07, p = 0.382				
Age (years)	−0.027	(−0.171; 0.116)	−0.041	0.706
Female gender[a]	1.304	(−1.580; 4.189)	0.085	0.372
Education ≥ 12 years[b]	1.015	(−1.983; 4.013)	0.062	0.504
Family status[c]				
Married	−1.702	(−5.113; 1.709)	−0.111	0.325
Divorced/Widowed	−3.030	(−8.647; 2.587)	−0.110	0.288
≥2 comorbidities[d]	2.224	(−0.490; 4.938)	0.149	0.107
Constant	27.878	(22.894; 32.862)	–	<0.001***
Stereotype agreement (n = 126): R^2 = 0.071, adjusted R^2 = 0.024, $F_{(6,\ 119)}$ = 1.51, p = 0.181				
Age (years)	0.109	(−0.021; 0.240)	0.180	0.100
Female gender[a]	−0.042	(−2.663; 2.580)	−0.003	0.975
Education ≥ 12 years[b]	−1.457	(−4.224; 1.309)	−0.096	0.299
Family status[c]				
Married	−3.877	(−6.989; −0.765)	−0.276	0.015*
Divorced/Widowed	−3.383	(−8.489; 1.723)	−0.134	0.192
≥ 2 comorbidities[d]	1.399	(−1.078; 3.876)	0.102	0.266
Constant	17.314	(12.754; 21.875)	–	<0.001***
Application to self (n = 127): R^2 = 0.164, adjusted R^2 = 0.122, $F_{(6,\ 120)}$ = 3.92, p = 0.001				
Age (years)	−0.164	(−0.285; −0.042)	−0.274	0.009**
Female gender[a]	0.568	(−1.862; 2.999)	0.041	0.644
Education ≥ 12 years[b]	−0.415	(−2.942; 2.111)	−0.028	0.745
Family status[c]				
Married	−2.332	(−5.206; 0.542)	−0.169	0.111
Divorced/Widowed	−0.181	(−4.914; 4.552)	−0.007	0.940
≥ 2 comorbidities[d]	2.347	(0.061; 4.634)	0.175	0.044*
Constant	21.848	(17.648; 26.048)	–	<0.001***
Harm to self-esteem (n = 127): R^2 = 0.064, adjusted R^2 = 0.018, $F_{(6,\ 120)}$ = 1.38, p = 0.229				
Age (years)	−0.146	(−0.329; 0.038)	−0.171	0.118
Female gender[a]	1.791	(−1.892; 5.474)	0.091	0.338
Education ≥ 12 years[b]	2.338	(−1.491; 6.166)	0.110	0.229
Family status[c]				
Married	−0.573	(−4.929; 3.782)	−0.029	0.795
Divorced/Widowed	1.958	(−5.214; 9.130)	0.055	0.590
≥2 comorbidities[d]	2.776	(−0.689; 6.241)	0.144	0.115
Constant	19.744	(13.381; 26.108)	–	<0.001***

*b = unstandardized regression coefficient. CI = confidence interval for unstandardized regression coefficients. β = standardized regression coefficient. *p < 0.05, **p < 0.01, ***p < 0.001.*

[a] *Reference category for gender: male.*

[b] *Reference category for education: < 12 years.*

[c] *Reference category for family status: single.*

[d] *Reference category for comorbidities: ≤ 1 comorbidity.*

substantiated by longitudinal empirical evidence (39, 40). Notably, these longitudinal studies conceptualized mental health self-stigma in relation to help seeking. The large variety of mental health stigma concepts and measures in a growing number of studies has been criticized as a hindering factor for consistent stigma research (41). As a response to this concern, a common framework for mental illness stigma conceptualization and assessment has been proposed, integrating the perspectives of the stigmatizers and the stigmatized, and considering different stigma facets in this context (41). We suggest to draw upon this framework in future studies in order to increase the consistency and comparability of empirical evidence.

Sociodemographic Correlates of Mental Health Self-Stigma

Our results showed that being married (vs. single) was associated with less *Stereotype agreement*, when adjusting for the other sociodemographics and the number of comorbidities. Given the lack of reported sociodemographic characteristics of mental health self-stigma in refugees from Syria, we draw upon a systematic review on mental health stigma in individuals in different Arabic cultural contexts (42). This study reported findings on perceptions of mental illness as shameful and incompatible with marriage. Similarly, a study on mental health stigma in different Muslim communities [the majority of Syrian refugees in Germany are Muslims (3)] reported detrimental effects on marriage prospects (43). This could provide an explanation for the higher levels of mental health self-stigma among single vs. married individuals in our sample.

Results of our multivariate regression model also showed a significantly higher level of stigmatizing views on oneself (*Application to self*) for younger vs. older individuals. This is in line with results from a Canadian population-based survey which reported significantly lower self-stigma of depression for older adults (44). While a systematic review and meta-analysis found no overall associations between mental health self-stigma and age, the majority (64%) of those studies reporting significant findings indicated a negative relationship (17).

Associations of self-stigma with gender and school-based education were inconsistent and overall not significant. Given that correlates may vary depending on cultural contexts (45), future studies should consider the interplay between sociodemographic factors such as age, gender, religion and family status when investigating mental health self-stigma in Syrian refugee samples.

Comorbidities as a Risk Factor for Mental Health Self-Stigma

Our data indicated a substantial psychopathological symptom burden among study participants. More than 60% of the *Sanadak* sample scored above the cutoff for at least one comorbid mental disorder. Similarly, results from a recent follow-up examination yielded persistently elevated rates of mental disorders among Syrian refugees in Germany (46). Moreover, a systematic review and meta-analysis reported elevated levels of anxiety, depression, and posttraumatic stress disorder in refugees resettling in high-income countries (47).

Controlling for sociodemographic covariates, a higher number of psychopathological comorbidities was significantly associated with a stronger application of stigmatizing views to oneself (*Application to self*). We found no such associations for the remaining three self-stigma subscales (*Stereotype awareness*, *Stereotype agreement*, *Harm to self-esteem*). Stronger self-stigma for higher symptom severity has been reported before, both in Western samples and in Arabic refugee samples (17, 48, 49). Yet, the question of causality in this context is still unclear, with evidence for both higher symptom burden as a result of a higher self-stigma and vice versa (17). Previous studies have largely focused on self-stigma as a relevant contributor to, rather than consequence of, mental distress. This line of research has shown self-stigma to longitudinally predict negative outcomes such as impaired recovery (50), and worse social functioning (51).

On the other hand, possible reciprocal relationships between self-stigma and symptom severity have been addressed in previous studies (52). In the context of therapeutic intervention efforts, interrelations between symptom change and self-stigma change raise the question of relevant intervention targets and mechanisms (53). Thus, more longitudinal research is needed to further elucidate this chicken-egg problem of mental ill-health and self-stigmatization. In this context, our results underline the relevance of the *Application to self* dimension when working with the progressive model of self-stigma. Considering that Syrian refugees in Germany may be faced to different forms of public stigma and discrimination at the same time, it would be interesting to investigate internalized negative views in this population group following an intersectional approach, i.e., concurrently considering multiple personal characteristics that could be associated with specific discrimination experiences (19, 54). In this way, future studies could expand on existing findings of perceived discrimination predicting depressive and generalized anxiety symptoms in Syrian refugees in Germany (46).

Limitations

The present study was based on a convenience sample and as such, not representative of Syrian refugees with posttraumatic stress symptoms living in Germany. A second limitation is that our analyses were explorative and based on cross-sectional data, allowing no conclusions on causal associations. Future research may elaborate our findings by investigating trajectories in the self-stigmatization process across time, applying a process-based longitudinal research design. Thirdly, we determined self-stigma and the mental health status of participants using self-report measures so that we cannot rule out biased answers due to social desirability. Fourthly, the comparability of our findings to previous findings is limited by differences in study samples and measures of mental health self-stigma. Fifthly, we did not differentially investigate possible associations between specific psychopathological syndromes and mental health self-stigma. For example, depressive symptoms such as a negative self-image and associated cognitive biases might be closely linked to self-stigmatization. These potential associations should be addressed in future studies. Sixthly, we did not examine possible differences in mental health self-stigma according to participants' asylum status, whereas this aspect might have an effect not only on mental health self-stigma, but on mental health as a whole. Expanding the scope of post-migration stressors in mental health self-stigma research in refugee populations may provide important insights on risk and protective factors on a structural level.

Implications for Future Research

Previous research has suggested mental health self-stigma as an important barrier to accessing mental health care among refugees (7). Therefore, it is important to address mental health self-stigma in these populations. However, studies in this regard are still scarce and future research is needed to better understand self-stigma in refugees. Such an understanding is an important prerequisite for identifying the specific needs of refugees in order to develop tailored psychosocial intervention approaches. Reducing self-stigma in refugee groups with typically high prevalence of mental disorders is important to facilitate mental health care utilization.

Conclusion

We provide empirical evidence on mental health self-stigma and its correlates in Syrian refugees with posttraumatic stress residing in Germany, a population in which self-stigma remains not well-studied to date. Younger, unmarried refugees having multiple psychopathological comorbidities appear to be at increased risk for mental health self-stigma, which in turn could be an obstacle to access mental health care. Legal authorities and providers of psychosocial support need to be sensitized to this particular risk association in order to reduce the long-term risk of adverse psychological consequences and to promote social integration. Correlates of mental health self-stigma should be considered in the development of stigma reduction campaigns, as well as efforts to increase access to mental healthcare among Syrian refugees with mental health concerns in Germany.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because of patient confidentiality and participant privacy. Requests to access the datasets should be directed to Alexander Pabst, Alexander.Pabst@medizin.uni-leipzig.de.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by ethics committee of the Medical Faculty of the University of Leipzig, Germany (ID: 111–17-ek) and was conducted in accordance with the Declaration of Helsinki (World Medical Association 2009) and the ICH guidelines for Good Clinical Practice (GCP). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JB contributed to acquisition of the data, formulated the research question, wrote the statistical analysis plan, conducted the statistical analyses, interpreted the data, wrote the manuscript, and gave final approval of the version to be published. AP was the trial statistician, contributed to acquisition of the data, supported in analysis of the data, interpreting the results, and drafting the manuscript, and gave final approval of the version to be published. SR substantially contributed to acquisition of the data, supported in drafting the manuscript, and gave final approval of the version to be published. ML, AR, MN, JD, TG, AK, and H-HK contributed to acquisition of the data, revised the manuscript critically for important intellectual content, and gave final approval of the version to be published. SR-H conceptualized and designed the study, supported in interpreting the data, revised the manuscript critically for important intellectual content, and gave final approval of the version to be published. All authors contributed to the article and approved the submitted version.

FUNDING

This publication was part of the study HELP@APP: Development and evaluation of a self-help app for traumatized Syrian refugees and was funded by means of the Innovationsfonds of the German Federal Joint Committee (Gemeinsamer Bundesausschuss/G-BA; Grant 01VSF16033). The funding source had no involvement in study design, in the collection, analysis and interpretation of data, in the writing of the report, and in the decision to submit the article for publication.

ACKNOWLEDGMENTS

The authors would like to thank all study participants for their time and for speaking so openly. Members of the HELP@APP Study Group: SR-H (Principle Investigator), AK (Co-Principal Investigator), H-HK (Co-Principal Investigator), Maram Alhamarneh, Mais Alhamwi, Ghadir Ali, Zain Assaad, Ismail Ayoub, JB, Franziska Berg, Franziska Elias, Johannes Golchert, TG, Rahel Hoffmann, David Jäckle, Franziska Jung, Yamen Khamis, Waad Layka, Alia Kheirbek, Chiara Manthey, Amera Mojahed, MN, Anna Plexnies, AR, SR, Adrian Schultz. We further acknowledge support from Leipzig University for Open Access Publishing.

REFERENCES

1. UNHCR - Refugee Statistics. *UNHCR.* (2020). Available online at: https://www.unhcr.org/refugee-statistics/ (accessed December 1, 2020).
2. Worbs S, Rother N, Kreienbrink A. Syrische Migranten in Deutschland als bedeutsame neue Bevölkerungsgruppe = Syrian migrants in Germany as a significant new population group. *Isi Informationsd Soz Indik.* (2019) 61:2–6. doi: 10.15464/isi.61.2019.2-6
3. Mediendienst Integration. *Zahlen und Fakten: Syrische Flüchtlinge = Facts and Figures: Syrian Refugees.* Mediendienst Integration (2020). Available online at: https://mediendienst-integration.de/migration/flucht-asyl/syrische-fluechtlinge.html (accessed December 1, 2020).
4. Böttche M, Heeke C, Knaevelsrud C. Sequenzielle Traumatisierungen, Traumafolgestörungen und psychotherapeutische Behandlungsansätze bei kriegstraumatisierten erwachsenen Flüchtlingen in Deutschland = Trauma, post-traumatic disorders and psychotherapeutic treatment approaches in war-traumatized adult refugees in Germany. *Bundesgesundheitsblatt Gesundheitsforsch Gesundheitsschutz.* (2016) 59:621–6. doi: 10.1007/s00103-016-2337-4
5. Georgiadou E, Zbidat A, Schmitt GM, Erim Y. Prevalence of mental distress among Syrian refugees with residence permission in Germany: a registry-based study. *Front Psychiatry.* (2018) 9:1–12. doi: 10.3389/fpsyt.2018.00393
6. Satinsky E, Fuhr DC, Woodward A, Sondorp E, Roberts B. Mental health care utilisation and access among refugees and asylum seekers in Europe: a systematic review. *Health Policy.* (2019) 123:851–63. doi: 10.1016/j.healthpol.2019.02.007
7. Byrow Y, Pajak R, Specker P, Nickerson A. Perceptions of mental health and perceived barriers to mental health

help-seeking amongst refugees: a systematic review. *Clin Psychol Rev.* (2020) 75:101812. doi: 10.1016/j.cpr.2019.101812

8. Goffman E. *Stigma; Notes on the Management of Spoiled Identity*. Englewood Cliffs, NJ: Prentice-Hall (1963).
9. Link BG, Phelan JC. Conceptualizing stigma. *Annu Rev Sociol.* (2001) 27:363–85. doi: 10.1146/annurev.soc.27.1.363
10. Rüsch N, Angermeyer MC, Corrigan PW. Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *Eur Psychiatry.* (2005) 20:529–39. doi: 10.1016/j.eurpsy.2005.04.004
11. Corrigan PW, Watson AC, Barr L. The self-stigma of mental illness: implications for self-esteem and self-efficacy. *J Soc Clin Psychol.* (2006) 25:875–84. doi: 10.1521/jscp.2006.25.8.875
12. Corrigan PW, Michaels PJ, Vega E, Gause M, Watson AC, Rüsch N. Self-stigma of mental illness scale-short form: reliability and validity. *Psychiatry Res.* (2012) 199:65–9. doi: 10.1016/j.psychres.2012.04.009
13. Gavriel-Fried B, Rabayov T. Similarities and differences between individuals seeking treatment for gambling problems vs. alcohol and substance use problems in relation to the progressive model of self-stigma. *Front Psychol.* (2017) 8:1–8. doi: 10.3389/fpsyg.2017.00957
14. Corrigan PW, Rafacz J, Rüsch N. Examining a progressive model of self-stigma and its impact on people with serious mental illness. *Psychiatry Res.* (2011) 189:339–43. doi: 10.1016/j.psychres.2011.05.024
15. Schomerus G, Corrigan PW, Klauer T, Kuwert P, Freyberger HJ, Lucht M. Self-stigma in alcohol dependence: consequences for drinking-refusal self-efficacy. *Drug Alcohol Depend.* (2011) 114:12–7. doi: 10.1016/j.drugalcdep.2010.08.013
16. Corrigan PW, Bink AB, Schmidt A, Jones N, Rüsch N. What is the impact of self-stigma? Loss of self-respect and the "why try" effect. *J Ment Heal.* (2016) 25:10–5. doi: 10.3109/09638237.2015.1021902
17. Livingston JD, Boyd JE. Correlates and consequences of internalized stigma for people living with mental illness: a systematic review and meta-analysis. *Soc Sci Med.* (2010) 71:2150–61. doi: 10.1016/j.socscimed.2010.09.030
18. Oexle N, Waldmann T, Staiger T, Xu Z, Rüsch N. Mental illness stigma and suicidality: the role of public and individual stigma. *Epidemiol Psychiatr Sci.* (2018) 27:169–75. doi: 10.1017/S2045796016000949
19. Kira IA, Lewandowski L, Ashby JS, Templin T, Ramaswamy V, Mohanesh J. The traumatogenic dynamics of internalized stigma of mental illness among Arab American, Muslim, and refugee clients. *J Am Psychiatr Nurses Assoc.* (2014) 20:250–66. doi: 10.1177/1078390314542873
20. Bonfils KA, Lysaker PH, Yanos PT, Siegel A, Leonhardt BL, James A V., et al. Self-stigma in PTSD: prevalence and correlates. *Psychiatry Res.* (2018) 265:7–12. doi: 10.1016/j.psychres.2018.04.004
21. Dardas LA, Bailey DE, Simmons LA. Adolescent depression in the Arab region: a systematic literature review. *Issues Ment Health Nurs.* (2016) 37:569–85. doi: 10.1080/01612840.2016.1177760
22. Abdullah T, Brown TL. Mental illness stigma and ethnocultural beliefs, values, and norms: an integrative review. *Clin Psychol Rev.* (2011) 31:934–48. doi: 10.1016/j.cpr.2011.05.003
23. Abudabbeh N, Hays PA. Cognitive-behavioral therapy with people of arab heritage. In: *Culturally Responsive Cognitive-Behavioral Therapy: Assessment, Practice, and Supervision*. Washington, DC: American Psychological Association. p. 141–59.
24. Hassan G, Ventevogel P, Jefee-Bahloul H, Barkil-Oteo A, Kirmayer LJ. Mental health and psychosocial wellbeing of Syrians affected by armed conflict. *Epidemiol Psychiatr Sci.* (2016) 25:129–41. doi: 10.1017/S2045796016000044
25. Renner A, Hoffmann R, Nagl M, Roehr S, Jung F, Grochtdreis T, et al. Syrian refugees in Germany: perspectives on mental health and coping strategies. *J Psychosom Res.* (2020) 129:109906. doi: 10.1016/j.jpsychores.2019.109906
26. Golchert J, Roehr S, Berg F, Grochtdreis T, Hoffmann R, Jung F, et al. HELP@APP: development and evaluation of a self-help app for traumatized Syrian refugees in Germany- a study protocol of a randomized controlled trial. *BMC Psychiatry.* (2019) 19:1–12. doi: 10.1186/s12888-019-2110-y
27. Roehr S, Wittmann F, Jung F, Hoffmann R, Renner A, Dams J, et al. Strategien zur Rekrutierung von Geflüchteten für Interventionsstudien: Erkenntnisse aus dem Sanadak'-Trial = Strategies to recruit refugees for intervention studies: lessons learned from the "Sanadak" trial. *PPmP Psychother Psychosom Medizinische Psychol.* (2019) 69:484–9. doi: 10.1055/a-1030-4570
28. Foa EB, McLean CP, Zang Y, Zhong J, Powers MB, Kauffman BY, et al. Psychometric properties of the posttraumatic diagnostic scale for DSM-5 (PDS-5). *Psychol Assess.* (2016) 28:1166–71. doi: 10.1037/pas0000258
29. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med.* (2001) 16:606–13. doi: 10.1046/j.1525-1497.2001.016009606.x
30. von Glischinski M, Teismann T, Prinz S, Gebauer JE, Hirschfeld G. Depressive symptom inventory suicidality subscale: optimal cut points for clinical and non-clinical samples. *Clin Psychol Psychother.* (2016) 23:543–9. doi: 10.1002/cpp.2007
31. Spitzer RL, Kroenke K, Williams JBW, 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
32. Kroenke K, Spitzer RL, Williams JBW. The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms. *Psychosom Med.* (2002) 64:258–66. doi: 10.1097/00006842-200203000-00008
33. R Core Team. *R: A Language and Environment for Statistical Computing.* (2013). Available online at: http://www.r-project.org/ (accessed December 1, 2020).
34. RStudio Team. *RStudio: Integrated Development for R.* Boston, MA: RStudio Team (2015).
35. Alonso J, Buron A, Bruffaerts R, He Y, Posada-Villa J, Lepine JP, et al. Association of perceived stigma and mood and anxiety disorders: results from the World Mental Health Surveys. *Acta Psychiatr Scand.* (2008) 118:305–14. doi: 10.1111/j.1600-0447.2008.01241.x
36. Hansson L, Lexén A, Holmén J. The effectiveness of narrative enhancement and cognitive therapy: a randomized controlled study of a self-stigma intervention. *Soc Psychiatry Psychiatr Epidemiol.* (2017) 52:1415–23. doi: 10.1007/s00127-017-1385-x
37. Boyd JE, Otilingam PG, Deforge BR. Brief version of the Internalized Stigma of Mental Illness (ISMI) scale: psychometric properties and relationship to depression, self esteem, recovery orientation, empowerment, and perceived devaluation and discrimination. *Psychiatr Rehabil J.* (2014) 37:17–23. doi: 10.1037/prj0000035
38. Lindheimer N, Karnouk C, Hahn E, Churbaji D, Schilz L, Rayes D, et al. Exploring the representation of depressive symptoms and the influence of stigma in arabic-speaking refugee outpatients. *Front Psychiatry.* (2020) 11:579057. doi: 10.3389/fpsyt.2020.579057
39. Vogel DL, Bitman RL, Hammer JH, Wade NG. Is stigma internalized? The longitudinal impact of public stigma on self-stigma. *J Couns Psychol.* (2013) 60:311–316. doi: 10.1037/a0031889
40. Fox AB, Smith BN, Vogt D. How and when does mental illness stigma impact treatment seeking? Longitudinal examination of relationships between anticipated and internalized stigma, symptom severity, and mental health service use. *Psychiatry Res.* (2018) 268:15–20. doi: 10.1016/j.psychres.2018.06.036
41. Fox AB, Earnshaw VA, Taverna EC, Vogt D. Conceptualizing and measuring mental illness stigma: The mental illness stigma framework and critical review of measures. *Stigma Heal.* (2018) 3:348–76. doi: 10.1037/sah0000104
42. Zolezzi M, Alamri M, Shaar S, Rainkie D. Stigma associated with mental illness and its treatment in the Arab culture: a systematic review. *Int J Soc Psychiatry.* (2018) 64:597–609. doi: 10.1177/0020764018789200
43. Ciftci A, Jones N, Corrigan PW. Mental health stigma in the Muslim community. *J Muslim Ment Health.* (2012) 7:17–32. doi: 10.3998/jmmh.10381607.0007.102
44. Mackenzie CS, Visperas A, Ogrodniczuk JS, Oliffe JL, Nurmi MA. Age and sex differences in self-stigma and public stigma concerning depression and suicide in men. *Stigma Heal.* (2019) 4:233–41. doi: 10.1037/sah0000138
45. Yang LH, Thornicroft G, Alvarado R, Vega E, Link BG. Recent advances in cross-cultural measurement in psychiatric epidemiology: utilizing "what matters most" to identify culture-specific aspects of stigma. *Int J Epidemiol.* (2014) 43:494–510. doi: 10.1093/ije/dyu039

46. Borho A, Viazminsky A, Morawa E, Schmitt GM, Georgiadou E, Erim Y. The prevalence and risk factors for mental distress among Syrian refugees in Germany: a register-based follow-up study. *BMC Psychiatry.* (2020) 20:1–13. doi: 10.1186/s12888-020-02746-2
47. Henkelmann J-R, de Best S, Deckers C, Jensen K, Shahab M, Elzinga B, et al. Anxiety, depression and post-traumatic stress disorder in refugees resettling in high-income countries: systematic review and meta-analysis. *BJPsych Open.* (2020) 6:e68. doi: 10.1192/bjo.2020.54
48. Boyd JE, Adler EP, Otilingam PG, Peters T. Internalized Stigma of Mental Illness (ISMI) Scale: A multinational review. *Compr Psychiatry.* (2014) 55:221–31. doi: 10.1016/j.comppsych.2013.06.005
49. Kira IA, Ramaswamy V, Lewandowski L, Mohanesh J, Abdul-Khalek H. Psychometric assessment of the Arabic version of the Internalized Stigma of Mental Illness (ISMI) measure in a refugee population. *Transcult Psychiatry.* (2015) 52:636–58. doi: 10.1177/1363461515569755
50. Oexle N, Müller M, Kawohl W, Xu Z, Viering S, Wyss C, et al. Self-stigma as a barrier to recovery: a longitudinal study. *Eur Arch Psychiatry Clin Neurosci.* (2018) 268:209–12. doi: 10.1007/s00406-017-0773-2
51. Yanos PT, West ML, Gonzales L, Smith SM, Roe D, Lysaker PH. Change in internalized stigma and social functioning among persons diagnosed with severe mental illness. *Psychiatry Res.* (2012) 200:1032–4. doi: 10.1016/j.psychres.2012.06.017
52. Verhaeghe M, Bracke P. Organizational and individual level determinants of stigmatization in mental health services. *Community Ment Health J.* (2007) 43:375–400. doi: 10.1007/s10597-007-9083-x
53. Pearl RL, Forgeard MJC, Rifkin L, Beard C, Björgvinsson T. Internalized stigma of mental illness: changes and associations with treatment outcomes. *Stigma Heal.* (2017) 2:2–15. doi: 10.1037/sah0000036
54. Seng JS, Lopez WD, Sperlich M, Hamama L, Reed Meldrum CD. Marginalized identities, discrimination burden, and mental health: empirical exploration of an interpersonal-level approach to modeling intersectionality. *Soc Sci Med.* (2012) 75:2437–45. doi: 10.1016/j.socscimed.2012.09.023

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.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 22 July 2021
doi: 10.3389/fpsyt.2021.665611

Mental Disorders Among Health Care Workers at the Early Phase of COVID-19 Pandemic in Kenya; Findings of an Online Descriptive Survey

Edith Kamaru Kwobah[1]*, Ann Mwangi[2], Kirtika Patel[3], Thomas Mwogi[4], Robert Kiptoo[1] and Lukoye Atwoli[5,6]

[1] Department of Mental Health, Moi Teaching and Referral Hospital, Eldoret, Kenya, [2] Department of Mathematics, Physics and Computing, Moi University, Eldoret, Kenya, [3] Department of Immunology, Moi University, Eldoret, Kenya, [4] Directorate of Informatics, Moi Teaching and Referral Hospital, Eldoret, Kenya, [5] Department of Medicine, Aga Khan University Medical College, East Africa, Nairobi, Kenya, [6] Department of Mental Health and Behavioral Sciences, Moi University, Eldoret, Kenya

Edited by:
Eric Hahn,
Charité—Universitätsmedizin Berlin, Germany

Reviewed by:
Zeinab Abbas,
Lebanese International University, Lebanon
Agata Benfante,
University of Turin, Italy

****Correspondence:***
Edith Kamaru Kwobah
eckamaru@gmail.com

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *08 February 2021*
Accepted: *24 June 2021*
Published: *22 July 2021*

Citation:
Kwobah EK, Mwangi A, Patel K, Mwogi T, Kiptoo R and Atwoli L (2021) Mental Disorders Among Health Care Workers at the Early Phase of COVID-19 Pandemic in Kenya; Findings of an Online Descriptive Survey. Front. Psychiatry 12:665611. doi: 10.3389/fpsyt.2021.665611

Background: Healthcare workers responding to the Corona Virus Pandemic (COVID-19) are at risk of mental illness. Data is scanty on the burden of mental disorders among Kenyan healthcare workers responding to the pandemic that can inform mental health and psychosocial support. The purpose of this study was to establish the frequency and associated factors of worry, generalized anxiety disorder, depression, posttraumatic stress disorder and poor quality of sleep among Kenyan health care workers at the beginning of COVID-19 pandemic.

Methods: We conducted an online survey among 1,259 health care workers in Kenya. A researcher developed social demographic questionnaire and several standardized tools were used for data collection. Standardized tools were programmed into Redcap, (Research Electronic Data Capture) and data analysis was performed using R Core Team. In all analysis a p-value < 0.05 was considered significant.

Results: 66% of the participants reported experiencing worry related to COVID-19. 32.1% had depression, 36% had generalized anxiety, 24.2% had insomnia and 64.7% scored positively for probable Post Traumatic Stress Disorder (PTSD). Depression was higher among females compared to men (36.5 vs. 26.9%, $p = 0.003$), workers $<$35 years old compared to older ones (38.1 vs. 26.4%, $p < 0.001$), and those who were not married compared to those who were married (40.6 vs. 27.6%, $p < 0.001$). Generalized anxiety was commoner among workers aged $<$35 years (43.5 vs. 29.3%, $p < 0.001$), females (41.7 vs. 29.2%, $p < 0.001$), those who mere not married compared to the married (45.2 vs. 31.2%, $p < 0.001$) and those with $<$10 years working experience (41.6 to 20.5%, $p < 0.001$). Younger health care professional had a higher proportion of insomnia compared to the older ones (30.3 vs. 18.6%, $p < 0.001$). Insomnia was higher among those with $<$10 years' experience compared to those with more than 20 years' experience(27.3 vs. 17.6%, $p = 0.043$)

Conclusion: Many Kenyan healthcare workers in the early phase of COVID-19 pandemic suffered from various common mental disorders with young, female professionals who are not married bearing the bigger burden. This data is useful in informing interventions to promote mental and psychosocial wellbeing among Kenyan healthcare workers responding to the pandemic.

Keywords: prevalence, health care workers, Kenya, mental disorders, COVID-19

BACKGROUND

The mental health impact of the Corona Virus disease of 2019 (COVID-19) is expected be huge due to the nature of the disease and the containment measures imposed (1). There is sufficient evidence to indicate that during any epidemic or pandemic, healthcare workers are affected mentally to a great extent (2). Unique to the case of COVID-19 pandemic in the early phase was the widespread media coverage, high rates of human to human transmission, and the fact that a lot is still unknown about this new virus, which may all contribute to poor mental health among these health care professionals. The ever-increasing number of confirmed and suspected cases, overwhelming workload, depletion of personal protection equipment, lack of specific curative drugs, and healthcare workers feelings of being inadequately supported significantly contribute to the risk of their mental health illness (3).

An increase in mental and psychological distress during epidemics has been documented in literature. As an example, the heath care workers who responded to the 2014-2015 Ebola epidemic in Africa reported high levels of psychological symptoms (4). Similarly, during the outbreak of Severe Acute Respiratory Syndrome (SARS) in Hong Kong and Beijing, 20% of the total number of reported cases in the end were of frontline healthcare workers, who had to face a tremendous mental burden in addition to physical strain in taking care of patients with the highly contagious disease (5). Further, a previous study found that during the outbreak of infectious diseases, the affected hospitals experienced severe staff shortage as a result of personal or family health concerns, child care issues, quarantine measures or inability to get to work, and that health care workers were particularly worried for both their own and their family's health, and they experienced significant psychosocial trauma (6). In Singapore following the SARS outbreak, doctors had to be more vigilant when examining and reviewing patients, and it is reported that 20% of the doctors and nurses suffered PTSD -Post Traumatic Stress Disorder (7).

During a pandemic, healthcare workers are likely to express worry, besides fulfilling criteria for specific mental health disorders. A rapid review of literature done between March and April 2020 reported that health care workers working during the current pandemic reported frequent worry regarding their own health and the fear of infecting their families, friends and colleagues (8). A web based survey that included 31 countries across the globe, including Kenya, conducted between April and May 2021 across the globe reported that 60% of health care workers had anxiety and 53% had mild to moderate depression (9). A review of the immediate impact of Covid-19 revealed that up to 35% of healthcare workers are likely to be report symptoms of traumatic stress (10).

There has been a call across the globe to put in all possible measures to preserve and enhance resilience of healthcare workers (11) and for managers to proactively take steps to protect the mental well-being of staff (12). Such efforts need to be backed by evidence of the burden of the mental illness among these front liners, but unfortunately there is scanty data from the Kenyan context and other low resource settings to guide interventions to improve mental health and psychological support among healthcare workers. Such evidence would be useful not only for Kenya but for similar contexts in low and middle income countries where human resource for health is especially constrained, hence are likely to be stretched some more by the current pandemic, thus increasing their risk of mental ill health (13). This study therefore sought to 1. Determine the Frequency of worry, generalized anxiety disorder, depression, posttraumatic stress disorder (PTSD) and poor quality of sleep among health care professionals at the beginning of the COVID-19 pandemic- [these conditions were selected as they have been demonstrated as being highly prevalent among healthcare workers even before the pandemic (14, 15)], and 2.To establish the association between socio-demographic characteristics and mental disorders among health care professionals at the beginning of COVID-19 pandemic in Kenya.

MATERIALS AND METHODS

A cross- sectional descriptive online survey was used for this study. Trained healthcare professionals working in healthcare settings during the COVID-19 19 pandemic were included—these included, nurses, doctors, clinical officers and public health officers interacting with patients at the time of the study. Trained nurses, doctors, clinical officers and public health officers who do not interact with patients on day to day basis such as professionals working with insurance companies, those working in administration settings only or those who work exclusively in teaching institutions were excluded.

The survey questionnaires were programmed into Redcap, (Research Electronic Data Capture) a secure, web-based software platform designed to support data capture for research studies (16). A researcher developed social demographic questionnaire

---

Abbreviations: AOR, adjusted odds ratio; COVID-19, corona virus disease of 2019; DSMV, diagnostic statistical manual version V; GAD, generalized anxiety disorder; PHQ, patient health questionnaire; PTSD, post-traumatic stress disorder.

was used to collect data on age, sex, cadre, place of work, role during the pandemic and years of experience. Standardized tools were used for data collection. For anxiety we used Generalized Anxiety Disorder 7 (GAD 7) which we scored 0–4 = no anxiety, 5–9 = mild anxiety, 10–14 = moderate anxiety and $\geq$15- severe anxiety (17). GAD 7 has demonstrated good internal consistency and convergent validity in heterogeneous samples (18) and has been used within Kenyan settings (19, 20). For depression we used Patient Health Questionnaire (PHQ 9) for depression which we scored 0–5 = Mild depression, 6–10 = moderate depression, 11–15 = moderately severe and 16–20 =severe depression (21). PHQ 9 is a widely used tool for screening for depression with a good reliability and convergent validity (22) and has been used previously in Kenya, having demonstrated good content validity in a study in Western Kenya (23). For PTSD we used Primary Care- Post traumatic Stress disorder (PC- PTSD) for Diagnostic Statistical Manual (DSM) V—those who responded positively to 3 out of 5 questions about how the traumatic event(s) had affected them over the past month was regarded as probable PTSD (24). Though this has not been validated in a Kenyan context it has been shown to have high diagnostic accuracy and is highly acceptable due to its simplicity and brevity- having only five questions (25) and has shown good reliability even outside the US setting, as is the case of the Korean validation (26). We used the term Probable PTSD because to make a diagnosis of PTSD we would need a more comprehensive assessment by a clinician. For sleep difficulties we used Pittsburg Sleep Quality Index (PSQI), a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval, and used the following cut-offs; 0–7 = no clinically significant insomnia; 8–14 = subthreshold insomnia; 15–21 = clinical insomnia of moderate severity; 21–28 = severe clinical insomnia (27). Though not validated for use in Kenya it has been validated for other African settings such as Ethiopia (28) and Nigeria (29).

We used the Cochran formulae for sample size calculation for a survey, assuming a 50% prevalence of common mental disorders and a 95% confidence level: sample Size = $1.96^2 *[0.5 \times (1–0.5)]/[(0.05^2)]$. The minimum sample for each of the cadres was 384 (30). To allow for incomplete data, we planned to recruit at least 400 participants for each of the cadres.

A virtual snowball convenient sampling technique was utilized to recruit participants given. This was necessitated by limitation of a clear database for healthcare workers' contacts which would allow randomization. The online survey was sent to different healthcare workers in various networks on Facebook, WhatsApp and emails. A weekly reminder requesting workers to participate was sent between April 27th and June 5th 2020. The healthcare workers were requested to respond to the survey and share with their colleagues while a track of responses was kept using the Redcap software until there were no new responses for a period of 2 weeks, at which point we closed the survey.

Descriptive statistics were used to summarize the socio demographic characteristics of the participants. Chi square test was used in the bivariate analysis to assess categorical factors associated with the various mental health disorders and significant variables at 0.20 were considered in the multivariable logistic regression analysis and presented as adjusted odds ratios (AORs) with the corresponding 95% Confidence Intervals. The variables considered in the regression analysis were the various social demographics characteristics (age, gender, years of experience, cadre), having existing medical conditions, having contacts with a confirmed COVID-19 patient and the type of facility one was working in. Data analysis was performed using R Core Team (2013). In all analysis a p-value < 0.05 was considered significant.

RESULTS

Socio Demographic Characteristics

Though we initially hoped for 2,000 participants (400 per cadre for 5 cadres) only a total of 1,259 participants opened the survey after 6 weeks of sharing the link. A total of 69 did not consent to participate in the study. A further 233 consented but didn't respond to the various sections of the questionnaire including the socio demographic and were thus excluded from the analysis. Nine hundred fifty seven participants completed at least one or more components of the questionnaire, giving a response rate of 76%.

The median age of the participants was 35 years (IQR: 30–42). Majority 522 (54.5%) were females, married 619 (64.7%), non-specialist doctors 378 (39.5%), Christians 794 (83.0%) had an undergraduate level of education 433 (45.5) and had <10 years of experience in the medical field 546 (57%). Majority were working in a public facility 672 (70.2%) and most were in level 6 facility 306 (32%). Most of the participants reported that they did not have a medical condition 739 (77.2%) and also that they had never been treated for a mental illness 739 (77.2%) (**Table 1**).

Frequency and Factors Associated With Mental Disorders

Worry

Overall, 66% of the participants were "Quite a bit" or "Very worried" about at least one of the various issues related to COVID-19. Participants reported being "Quite a bit" or "Very worried" about: contracting COVID-19 (71%) being hospitalized for COVID-19 (58%), dying of COVID-19 (43%), losing a loved one due to COVID-19 (66%), being rejected due to COVID-19 (42%), infecting others with COVID-19 (65%) and not being able to do what they know best (61%). At least a third of the HCWs were worried about each of the COVID-19 related issues, including contacting the disease, dying and infecting others.

Being worried about COVID-19 19 was less likely to be reported among participants who had more years of experience compared to those who had less year (64 vs. 69%, $p = 0.026$), specialist doctors compared to other cadres (56 vs. 73% $p = 0.006$) and those who were working in private facilities compared to working in public facilities (61 vs. 68 % $p = 0.024$). Those who had contact with COVID-19 patients had higher likelihood of reporting worry than those who had not had contact (71 vs. 64%, $p = 0.040$) (**Table 2**).

Being worried about COVID-19 19 was less likely to be reported among participants who had more years of experience compared to those who had less year (64 vs. 69%, $p = 0.026$), specialist doctors compared to other cadres (56 vs. 73% $p =$

TABLE 1 | Sociodemographic characteristics of the participants.

	(*N* = 957)
Age (yrs)	
Mean (SD)	37.39 (10.18)
Range	20.00 - 83.0
Gender	
Male	435 (45.5%)
Female	522 (54.5%)
Marital status	
Married	619 (64.7%)
Single	272 (28.4%)
Widowed/Separated/Divorced	47 (4.9%)
Other	19 (2.0%)
Religion	
Muslim	118 (12.3%)
Christian	794 (83.0%)
Other	45 (4.7%)
Cadre	
Doctor non-specialist	378 (39.5%)
Doctor specialist	156 (16.3%)
Nurse	186 (19.5%)
Other	236 (24.7%)
Education level	
Diploma	151 (15.8%)
Higher diploma	59 (6.2%)
Undergraduate	435 (45.5%)
Masters	270 (28.2%)
Phd/Fellowship	42 (4.4%)
Years of experience	
0–10	546 (57.0%)
11–20	239 (25.0%)
20+	108 (18.0%)
Facility	
Public	672 (70.2%)
Private	285 (29.8%)
Level of facility	
Level 6 National	306 (32.0%)
Level 5 county referral	273 (28.5%)
Level 4 Subcounty	217 (22.7%)
Level 3 Heath Center	112 (11.7%)
Level 2 Dispensary	49 (5.1%)
Have a known medical condition	
Yes	218 (22.8%)
No	739 (77.2%)
Ever been treated for mental illness	
Yes	58 (6.1%)
No	899 (93.9%)
Currently working directly with COVID-19 clients	
Yes	231 (24.1%)
No	726 (75.9%)

0.006) and those who were working in private facilities compared to working in public facilities (61 vs. 68 % $p = 0.024$). Those who had contact with COVID-19 patients had higher likelihood of reporting worry than those who had not had contact (71 vs. 64%, $p = 0.040$) (**Table 2**).

Depression

One third of the participants 283/599 (32.1%) scored positively for depression, with a majority having moderate depression. On bivariate analysis, age, sex, marital status and years of experiences were significantly associated with depression. A higher proportion of female (36.5%) had moderate/sever symptoms of depression compared to males (26.9%), $p = 0.003$. In terms of age there was a higher proportion with depression among those <35 years (38.1%) compared to those above 35 years (26.4%), $p < 0.001$. Heath care providers who were married reported lower rates of depression (27.6%) compared to those who were not married (40.6%), $p < 0.001$. While the proportion with depression decreased as the number of years of experience in the medical increased; 37% for those with <10 years and 20% for those with above 20 years of experience, $p < 0.001$ (**Table 3**).

Adjusting for age, years of experience, cadre and type of facility on a multivariate logistic regression, sex and marital status were statistically significantly associated with depression. The odds of moderate/severe depression was 1.5 times in females compared to males (AOR = 1.47; 95% CI: 1.09, 2.00, $p = 0.012$). The odds of depression in health workers who were not married was 1.5 times that of those who were married (AOR = 1.47; 95%CI: 1.07, 2.01, $p = 0.016$). HCWS with more years of experience were less likely to score positively for depression (AOR 0.50, 95% CI 0.28–0.88, $p = 0.016$) (**Table 4**).

Generalized Anxiety Disorder

About a third of the participants, 291/807 (36%) scored positively for generalized anxiety. Those who experienced sleeping difficulties were 24.2% (189/780). On bivariate analysis, age, sex, marital status, years of experience in medical profession and cadre were statistically significantly associated with generalized anxiety disorder. Younger health care profession reported a higher proportion with generalized anxiety (43.5%) compared to those aged more than 35 years (29.3%), $p < 0.001$. Females had a higher proportion with generalized anxiety compared to males (41.7 vs. 29.2%), $p < 0.001$, while married had a lower proportion compared to those who were not married (31.2 vs. 45.2%), $p < 0.001$. In terms of experience as the number of years of experience in the health profession increased from <10 years to more than 20 years the proportion with generalized anxiety decreased from 41.6 to 20.5% $p < 0.001$, and the Doctor specialist reported the lowest proportions of generalized anxiety (28.4%) compared to other workers; non-specialist doctors 36.8%, nurses 30.9, and other cadres 43.9 %, $p = 0.013$ (**Table 3**).

Adjusting for age, years of experience, cadre and having contact with COVID-19 patients' on a multivariate logistic regression analysis, factors associated with generalized anxiety were sex and, marital status and the type of facility were associated with generalized anxiety. Females had a higher odds of having anxiety compared to males (AOR = 1.72; 95%CI: 1.25,

TABLE 2 | Factors associated with Worry among Healthcare workers.

Variable	Levels	Worry ($N = 957$)		
		Not very much ($n = 322$)	Very much ($n = 635$)	*P*-value
Age in years	<35	135 (29.2)	327 (70.8)	0.262
	≥35	187 (37.8)	308 (62.2)	
Sex	Male	155 (35.6%)	280 (64.4%)	0.235
	Female	167 (32.0%)	355 (68.0%)	
Marital status	Married	214 (34.6%)	405 (65.4%)	0.828
	Not married	86 (31.6%)	186 (68.4%)	
Years of experience	0–10	165 (30.2%)	381 (69.8%)	0.026
	11–20	95 (39.7%)	144 (60.3%)	
	20+	62 (36.0%)	110 (64.0%)	
Cadre	Specialist	68 (43.6%)	88 (56.4%)	0.006
	Doctor	132 (34.9%)	246 (65.1%)	
	Nurse	59 (31.7%)	127 (68.3%)	
	Other	63 (26.7%)	173 (73.3%)	
Facility	Public	211 (31.4%)	461 (68.6%)	0.024
	Private	111 (38.9%)	174 (61.1%)	
Have known medical condition	Yes	67 (30.7%)	151 (69.3%)	0.300
	No	255 (34.5%)	484 (65.5%)	
Contact COVID-1919 clients	Yes	65 (28.1%)	166 (71.9%)	0.040
	No	257 (35.4%)	469 (64.6%)	

2.37, $p = < 0.001$). Not being married and working in private facility increased the odds of having generalized anxiety (AOR = 1.41; 95%CI: 1.02, 1.96, $p = 0.036$), and (AOR = 1.57; 95%CI: 1.13, 2.20, $p = 0.008$), respectively. HCWS with more years of experience were less likely to score positively for GAD (AOR 0.49, 95% CI 0.27–0.97, p =0021) (**Table 4**).

Insomnia (Pittsburg Sleep Quality Index)

15 /957 (1.9%) of the healthcare workers had clinically moderate insomnia while 174/ 957 (22.3%) had subthreshold insomnia. On bivariate analysis, age, cadre and years of experience in the health profession were statistically significantly associated with insomnia. Younger health care professional had a higher proportion with insomnia (30.3%) compared to 18.6% among those over 35 years old, $p < 0.001$. Proportion with Insomnia was higher among those with less than 10 years' experience (27.3%) compared to those with more than 20 years' experience in the health profession (17.6), $p = 0.043$. Other cadres had higher proportions of insomnia (30.7) compared to specialist doctors (17.5), $p = 0.022$ (**Table 3**).

Adjusting for sex, marital status, years of experience,cadre and having a known medical condition in a multivariate logistic regression, health professionals aged 35 years and above had a reduced odds of reporting insomnia compared to the younger ones (AOR = 0.49; 95%CI: 0.28,0.83) (**Table 4**).

PTSD

For PTSD majority of the health workers didn't respond to the questions. Of the ones who responded 225/348 (64.7%) had some probable PTSD (**Table 5**). Due to the few number of people responding to the trauma questions, we did not do further analysis on this item.

DISCUSSIONS

This study adds to the existing literature on the frequency of mental illness among health care workers responding to COVID-19 in Kenya. We found a substantial degree of worry related to COVID-19 among healthcare workers in the early phase of the pandemic. The frequency of depression, anxiety, insomnia and probable PTSD were high. Young female workers with less experience in the healthcare profession were more likely to score positively for mental illness.

Worry

In our study two thirds of the participants were "Quite a bit" or "Very worried" about at least one of the various issues related to COVID-19. The leading three issues participants worried about were losing a loved one to COVID-19, infecting others, and getting infected with COVID-19. While worry may not be classified as a mental illness, it is of importance as it could be a precursor of more severe mental illness if not addressed (31). These findings are comparable to those of a Japanese study that showed that majority (78%) of the healthcare workers were seriously worried about COVID-19 and being infected was one of the leading concerns (32). The high frequency of worry in our setting is in keeping with a recent review that indicated that other than the main diagnostic categories of mental illness, many healthcare workers have various concerns regarding COVID-19 that increase their risk of experiencing psychological distress (33).

TABLE 3 | Factors associated with mental disorders on bivariate analysis.

Variable	Levels	PHQ (*N* = 882)			GAD (*N* = 807)			PSQI (*N* = 780)		
		Mild	Moderate/ severe	*P*-value	Present	None	*P*-value	Insomnia	No insomnia	*P*-value
Age in years	<35	265 (61.9)	163 (38.1)	<0.001	167 (43.5)	217 (56.5)	<0.001	114 (30.3)	262 (69.7)	<0.001
	≥35	334 (73.6)	120 (26.4)		124 (29.3)	299 (70.7)		75 (18.6)	329 (81.4)	
Sex	Male	296 (73.1)	109 (26.9)	0.003	106 (29.2)	257 (70.8)	<0.001	73 (20.8)	278 (79.2)	0.052
	Female	303 (63.5)	174 (36.5)		185 (41.7)	259 (58.3)		116 (27.0)	313 (73.0)	
Marital status	Married	419 (72.4)	160 (27.6)	<0.001	165 (31.2)	363 (68.8)	<0.001	110 (21.9)	392 (78.1)	0.052
	Not married	180 (59.4)	123 (40.6)		126 (45.2)	153 (54.8)		79 (28.4)	199 (71.6)	
Years of experience	0-10	320 (62.9)	189 (37.1)	<0.001	191 (41.6)	268 (58.4)	<0.001	123 (27.3)	327 (72.7)	0.043
	11–20	155 (71.4)	62 (28.6)		70 (34.7)	132 (65.3)		42 (21.6)	152 (78.4)	
	20+	124 (79.5)	32 (20.5)		30 (20.5)	116 (79.5)		24 (17.6)	112 (82.4)	
Cadre	Specialist	106 (70.7)	44 (29.3)	0.454	40 (28.4)	101 (71.6)	0.013	24 (17.5)	113 (82.5)	0.022
	Doctor	241 (67.7)	115 (32.3)		116 (36.8)	199 (63.2)		80 (25.5)	234 (74.5)	
	Nurse	116 (70.7)	48 (29.3)		47 (30.9)	105 (69.1)		27 (19.4)	112 (80.6)	
	Other	135 (64.0)	76 (36.0)		87 (43.9)	111 (56.1)		58 (30.7)	131 (69.3)	
Facility	Public	426 (69.4)	188 (30.6)	0.182	190 (33.7)	373 (66.3)	0.046	133 (24.8)	404 (75.2)	0.668
	Private	173 (64.6)	95 (35.4)		101 (41.4)	143 (58.6)		56 (23.0)	187 (77.0)	
Have known medical condition	Yes	138 (69.7)	60 (30.3)	0.600	73 (39.0)	114 (61.0)	0.378	50 (28.6)	125 (71.4)	0.155
	No	461 (67.4)	223 (32.6)		218 (35.2)	402 (64.8)		139 (23.0)	466 (77.0)	
Contact COVID-1919 clients	Yes	141 (68.1)	66 (31.9)	1.000	76 (39.8)	115 (60.2)	0.253	47 (25.1)	140 (74.9)	0.816
	No	458 (67.9)	217 (32.1)		215 (34.9)	401 (65.1)		142 (23.9)	451 (76.1)	

Participants who had more years of experience, were specialist doctors, or were working in private facilities had lower likelihood of reporting worry, while those who had had contact with COVID-19 patients had higher likelihood of reporting worry. Such worry has been associated with the fact that this disease is new, is highly contagious, has no cure and there is rapidly evolving information about its outcomes (34). This is also likely due to the several reports of healthcare workers contracting the disease and a good number succumbing to it in various part of the world (35).

Depression

Our study established high rates of depression among healthcare workers; 15.4% having moderately severe to severe depression and 16% having moderate depression. Our findings differ from a similar study done by Onchonga et al. in the same setting which reported that 53% of healthcare workers had mild depression while 9.2% had severe depression (36). This difference may be attributed to the timing of data collection during the pandemic as different waves may present with different levels of psychological distress. These findings are higher than that of a similar study involving 150 healthcare workers from Nepal which reported that 5.3% had moderate depression while 2.7% had moderately severe to severe depression (37). A study done among 906 healthcare workers from Singapore and India reported that 5.3% had moderate to severe depression (38). Our findings are also higher than a recent systematic review and meta-analysis done during the COVID-19 season that

TABLE 4 | Multivariate logistic regression.

Variable	PTSD			GAD			PSQI		
	AOR	**95% CI**	***P*-value**	**AOR**	**95% CI**	***P*-value**	**AOR**	**95% CI**	***P*-value**
Age in years <35	1			1			1		
≥35	0.83	0.53, 1.28	0.400	0.76	0.47, 1.20	0.200	0.49	0.28, 0.83	0.010
Sex Male	1			1			1		
Female	1.47	1.09, 2.00	0.012	1.72	1.25, 2.37	<0.001	1.39	0.98, 1.99	0.067
Marital status Married	1			1			1		
Not married	1.47	1.07, 2.01	0.016	1.41	1.02, 1.96	0.036	1.15	0.80, 1.64	0.500
Years of experience 0–10	1			1			1		
11–20	0.75	0.46, 1.21	0.200	0.92	0.56, 1.52	0.700	1.27	0.70, 2.33	0.400
20+	0.50	0.28, 0.88	0.016	0.49	0.27, 0.90	0.021	1.12	0.55, 2.28	0.800
Cadre Specialist	1			1			1		
Doctor	0.70	0.43, 1.14	0.150	0.94	0.57, 1.56	0.800	1.20	0.68, 2.17	0.500
Nurse	0.85	0.51, 1.43	0.500	1.01	0.59, 1.74	0.900	0.92	0.49, 1.73	0.800
Other	1.04	0.64, 1.70	0.900	1.59	0.96, 2.63	0.072	1.72	0.98, 3.10	0.064
Facility Public	1			1					
Private	1.29	0.94, 1.78	0.120	1.57	1.13, 2.20	0.008	-		
Known Medical condition									
Yes							1		
No	-						0.66	0.45, 0.99	0.045
Contact COVID-19 clients									
Yes			1						
No			0.75	0.53, 1.07	0.110	-			

included 13 studies with total of 33,062 participants reported a pooled prevalence of 22.8% for depression, although it is not clear the cut offs for depression that were used (39). These differences may be attributed to the differences in the settings of these studies and the social demographic characteristics of the participants.

Several factors were associated with Depression in our study. A higher proportion of female had moderate/severe symptoms of depression compared to males. This is similar to findings of a nationwide study done in India among 433 healthcare workers that reported that women were twice likely to have depressive symptoms requiring treatment (40). This may be attributed to the fact that even in the general population, females are at a higher risk of depression owing to various psychological and cultural factors (41). A study done in Chinese healthcare workers also found being male to be protective for depression (42). Health care providers who were married reported lower rates of depression compared to those who were not married and this is likely because marriage provides a support system that reduces the risk of depression. There was a higher proportion with depression among those <35 years compared to those above 35 years and the proportion with depression decreased as the number of years of experience in the medical field increased. This is in line with a study done among South African doctors that demonstrated that junior doctors are likely to experience burnout and depression and this could partly be attributed to the resilience that is built over years of practice resulting in less emotional exhaustion (43).

TABLE 5 | Frequency of various mental disorders among Kenyan Healthcare workers.

	Overall ($N = 957$)
Depression (PHQ)	
N-Miss	75
Mild	599 (67.9%)
Moderate	147 (16.7%)
Moderately severe	93 (10.5%)
Severe	43 (4.9%)
Generalized Anxiety Disorder	
N-Miss	150
None	516 (63.9%)
Mild	163 (20.2%)
Moderate	69 (8.6%)
Severe	59 (7.3%)
PC-PTSD (DSMV)	
N-Miss	609
None	123 (35.3%)
Probable PTSD	225 (64.7%)
Pittsburg Sleep Quality Index	
N-Miss	177
No Insomnia	591 (75.8%)
Clinically moderate Insomnia	15 (1.9%)
Subthreshold Insomnia	174 (22.3%)

Anxiety

In our study, a third of the participants (36%) had generalized anxiety. This is higher than the recent meta-analytic evidence which reported a pooled prevalence of 23% (39). These findings are comparable to those of the Nepal study that reported that 34% had anxiety but differed among those who had severe anxiety in Nepal where only 2% had moderately severe to severe anxiety (37).

Younger health care profession reported a higher proportion of generalized anxiety compared to those aged more than 35 years. This is in agreement with a Chinese study which also showed higher rates of anxiety among the younger healthcare workers compared to the older ones (44). Females had a higher proportion with generalized anxiety compared to males. This is in agreement with A Turkish study which indicated that females were at higher risks of generalized and health related anxiety compared to their male counterparts (45). These findings may be because, female gender has been associated with anxiety even in the general population. Those who were married had a lower proportion of anxiety compared to those who were not married. This may be explained by the social support that marriage brings to an individual. In terms of experience as the number of years of experience in the health profession increased from <10 years to more than 20 years the proportion with generalized anxiety decreased from and the doctor specialist reported the lowest proportion with generalized anxiety and these two may be associated with the confidence that comes with practice and managing more complex patients.

Sleeping Difficulties

Upto 24.2% of the healthcare workers reported sleeping difficulties. This is comparable to findings of a study done in China including both the heath care workers and the general population which reported that of the 5641 respondents, 20% had clinically significant insomnia (46). It was also higher than that of an Ethiopian study that reported a prevalence of 12.4%, but lower than the pooled prevalence of insomnia among healthcare workers from a meta-analytic evidence which was reported to be 38.9% (39).

In our study, younger health care professionals had a higher proportion with insomnia compared to those over 35 years old. Proportion with Insomnia decreased with increased experience in the health profession and those in other cadres other than nurses and doctors had a higher proportion with insomnia. Sleep difficulties among healthcare workers during this pandemic are important as they may not only increase vulnerability to the virus but also affect productivity of the workers who need to be at their optimal performance as they combat the virus (47).

Probable PTSD

It is worth noting that many participants did not respond to the trauma question. The reason for this is not clear and would warrant further evaluation of the understanding of trauma concepts in the Kenyan setting. Of those who responded, two thirds had been exposed to potentially traumatic events that could result in posttraumatic stress disorder. This is slightly higher than findings of a study done among 863 medical care workers from seven provinces in China using the Impact of Event Scale-6 which reported a prevalence of 40.2% (48). Similar high rates of PTSD have been shown in previous Flu out breaks. For example a study done among nurses working in south Korea during the Middle East Respiratory Syndrome (MERS) reported that more than half of the develop PTSD (49). The higher rates may be explained by the high mortality rates associated with Covid-19 being published throughout the globe that increases the risk of vicarious trauma among the providers.

Relevance to Policy and Practice

This study provides an evidence base for the burden of mental illness among healthcare workers responding to COVID-19 pandemic in Kenya. The burden which is likely to worsen as the pandemic lingers on is likely to further compromise the healthcare systems which were already understaffed prior to the pandemic. This evidence put together is a call to prioritize Kenyan healthcare worker wellness by putting in all possible measures to preserve and enhance resilience of healthcare workers and to link to care those who are affected in order to sustain productivity and ensure continuity.

A global survey involving 32 countries already reported that healthcare workers are employing various coping strategies to cope such as positive thinking and getting family support (50). Government as well as institutional efforts to help healthcare workers implement these coping strategies in order to enable them continue working with

COVID-19 patients are highly recommended. These efforts include managers taking proactive steps to protect the mental well-being of staff, to be frank about the challenging situations, and to allow teams to come together often to discuss their experiences and check on each other's well-being as well as link to care those who actually develop mental illness.

STUDY LIMITATIONS

While these findings are novel, a few limitations must be born in interpreting these findings. First this was an online survey and may have response bias where by the non-responders might be more stressed health care professionals who did not respond to the online survey. Second Online surveys are less accessible to some groups of people (the older professionals especially) hence creating a bias. Third, cross-sectional data can identify associations, not causal relationships with COVID-19. Fourth we used convenient sampling hence the results may not be generalizable to other settings. Finally, there are several personal factors that could influence mental health of individuals that were not considered in this study. Nevertheless our study provides more evidence for the burden of mental ill health among healthcare workers that would inform efforts to promote mental well-ness among healthcare workers during the current pandemic and in future similar situations.

CONCLUSIONS

This study established that there is a high frequency of depression, anxiety, insomnia and probable PTSD among healthcare workers responding to COVID-19 pandemic in Kenya with the highest burden being among young, less experienced female professionals. This evidence is a call to all relevant authorities to put in place measures to enhance healthcare workers mental and psychosocial well-ness in order to enable healthcare workers participate optimally in the fight against COVID-19. Further, longitudinal studies are recommended to better understand the causal relationship between COVID-19 and mental ill health among healthcare workers in Kenya and similar settings.

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.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Moi University/MTRH Institutional Research and Ethics Committee. The ethics committee waived the requirement of written informed consent for participation.

AUTHOR CONTRIBUTIONS

KP and EK developed the initial concept. EK, LA, KP, TM, AM, and RK were involved in concept development, review of manuscript, and approval for final submission. AM did the statistical analysis. TM programmed the survey into Redcap and performed data cleaning. LA sourced for funding. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by Kenya Medical Association, Equity project.

ACKNOWLEDGMENTS

The authors would like to acknowledge all Kenyan healthcare workers who took time to fill in the survey. A report on this work was shared with Kenya Medical Association. We acknowledge the coordination role played by Julius Barasa.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.665611/full#supplementary-material

REFERENCES

1. Semo B, Frissa SM. The Mental Health Impact of the COVID-19 Pandemic: Implications for Sub-Saharan Africa. *Psychol Res Behav Manag.* (2020) 13:713–20. doi: 10.2147/PRBM.S264286
2. Preti E, Di Mattei V, Perego G, Ferrari F, Mazzetti M, Taranto P, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep.* (2020) 22:43. doi: 10.1007/s11920-020-01166-z
3. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open.* (2020) 3:e203976. doi: 10.1001/jamanetworkopen.2020.3976
4. ji D, Ji Y-J, Duan X-Z, Li W-G, Sun Z-Q, Song X-A, et al. Prevalence of psychological symptoms among Ebola survivors and healthcare workers during the 2014-2015 Ebola outbreak in Sierra Leone: a cross-sectional study. *Oncotarget.* (2017) 8:12784–91. doi: 10.18632/oncotarget.14498
5. Wong TW, Yau JKY, Chan CLW, Kwong RSY, Ho SMY, Lau CC, et al. The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *Eur J Emerg Med.* (2005) 12:13–8. doi: 10.1097/00063110-200502000-00005
6. Martinese F, Keijzers G, Grant S, Lind J. How would Australian hospital staff react to an avian influenza admission, or an influenza pandemic? *Emerg Med Australas.* (2009) 21:12–24. doi: 10.1111/j.1742-6723.2008.01143.x
7. Chan AOM, Chan YH. Psychological impact of the 2003 severe acute respiratory syndrome outbreak on health care workers in a medium size regional general hospital in Singapore. *Occup Med.* (2004) 54:190–6. doi: 10.1093/occmed/kqh027
8. Barello S, Falcó-Pegueroles A, Rosa D, Tolotti A, Graffigna G, Bonetti L. The psychosocial impact of flu influenza pandemics on healthcare workers

and lessons learnt for the COVID-19 emergency: a rapid review. *Int J Public Health.* (2020) 1–12:1205–16. doi: 10.1007/s00038-020-01463-7

9. Htay MNN, Marzo RR, AlRifai A, Kamberi F, El-Abasiri RA, Nyamache JM, et al. Immediate impact of COVID-19 on mental health and its associated factors among healthcare workers: A global perspective across 31 countries. *J Glob Health.* (2020) 10:020381. doi: 10.7189/jogh.10.020381
10. Benfante A, Di Tella M, Romeo A, Castelli L. Traumatic stress in healthcare workers during covid-19 pandemic: a review of the immediate impact. *Front Psychol.* (2020) 11. doi: 10.3389/fpsyg.2020.569935
11. Santarone K, McKenney M, Elkbuli A. Preserving mental health and resilience in frontline healthcare workers during COVID-19. *Am J Emerg Med.* (2020) 38:1530–1. doi: 10.1016/j.ajem.2020.04.030
12. Greenberg N, Docherty M, Gnanapragasam S, Wessely S. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ.* (2020) 368:m1211. doi: 10.1136/bmj.m1211
13. WHO. *Priorities for research into human resources for health in low- and middle-income countries.* WHO. Available online at: https://www.who.int/bulletin/volumes/88/6/09-066290/en/ (accessed March 31, 2021).
14. Kim M-S, Kim T, Lee D, Yook J, Hong Y-C, Lee S-Y, et al. Mental disorders among workers in the healthcare industry: 2014 national health insurance data. *Ann Occup Environ Med.* (2018) 30:31. doi: 10.1186/s40557-018-0244-x
15. Ruitenburg MM, Frings-Dresen MH, Sluiter JK. The prevalence of common mental disorders among hospital physicians and their association with self-reported work ability: a cross-sectional study. *BMC Health Serv Res.* (2012) 12:292. doi: 10.1186/1472-6963-12-292
16. Software—REDCap. Available online at: https://projectredcap.org/software/ (accessed November 16, 2020).
17. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7. *Arch Intern Med.* (2006) 166:1092. doi: 10.1001/archinte.166.10.1092
18. Johnson SU, Ulvenes PG, Øktedalen T, Hoffart A. Psychometric properties of the general anxiety disorder 7-Item (GAD-7) Scale in a heterogeneous psychiatric sample. *Front Psychol.* (2019) 10:1713. doi: 10.3389/fpsyg.2019.01713
19. Nyongesa MK, Mwangi P, Koot HM, Cuijpers P, Newton CRJC, Abubakar A. The reliability, validity and factorial structure of the Swahili version of the 7-item generalized anxiety disorder scale (GAD-7) among adults living with HIV from Kilifi, Kenya. *Ann Gen Psychiatry.* (2020) 19:62. doi: 10.1186/s12991-020-00312-4
20. Osborn TL, Venturo-Conerly KE, Wasil AR, Schleider JL, Weisz JR. Depression and anxiety symptoms, social support, and demographic factors among kenyan high school students. *J Child Fam Stud.* (2020) 29:1432–43. doi: 10.1007/s10826-019-01646-8
21. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9. *J Gen Intern Med.* (2001) 16:606–13. doi: 10.1046/j.1525-1497.2001.016009606.x
22. Cameron IM, Crawford JR, Lawton K, Reid IC. Psychometric comparison of PHQ-9 and HADS for measuring depression severity in primary care. *Br J Gen Pract.* (2008) 58:32–6. doi: 10.3399/bjgp08X263794
23. Monahan PO, Shacham E, Reece M, Kroenke K, Ong'or WO, Omollo O, et al. Validity/Reliability of PHQ-9 and PHQ-2 depression scales among adults living with HIV/AIDS in Western Kenya. *J Gen Intern Med.* (2009) 24:189–97. doi: 10.1007/s11606-008-0846-z
24. Prins A, Bovin MJ, Smolenski DJ, Marx BP, Kimerling R, Jenkins-Guarnieri MA, et al. The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and evaluation within a veteran primary care sample. *J Gen Intern Med.* (2016) 31:1206–11. doi: 10.1007/s11606-016-3703-5
25. Bovin MJ, Kimerling R, Weathers FW, Prins A, Marx BP, Post EP, et al. Diagnostic Accuracy and Acceptability of the Primary Care Posttraumatic Stress Disorder Screen for the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) among US veterans. *JAMA Netw Open.* (2021) 4:e2036733. doi: 10.1001/jamanetworkopen.2020.36733
26. Jung Y-E, Kim D, Kim W-H, Roh D, Chae J-H, Park JE. A Brief Screening Tool for PTSD: Validation of the Korean Version of the Primary Care PTSD Screen for DSM-5 (K-PC-PTSD-5). *J Korean Med Sci.* (2018) 33:e338. doi: 10.3346/jkms.2018.33.e338
27. Carpenter JS, Andrykowski MA. Psychometric evaluation of the pittsburgh sleep quality index. *J Psychosom Res.* (1998) 45:5–13. doi: 10.1016/S0022-3999(97)00298-5
28. Salahuddin M, Maru TT, Kumalo A, Pandi-Perumal SR, Bahammam AS, Manzar MD. Validation of the pittsburgh sleep quality index in community dwelling ethiopian adults. *Health Qual Life Outcomes.* (2017) 15:58. doi: 10.1186/s12955-017-0637-5
29. Aloba OO, Adewuya AO, Ola BA, Mapayi BM. Validity of the pittsburgh sleep quality index (psqi) among nigerian university students. *Sleep Med.* (2007) 5:266–70. doi: 10.1016/j.sleep.2006.08.003
30. Cochran_1977_Sampling_Techniques_Third_Edition.pdf. Available online at: https://glad.geog.umd.edu/Potapov/_Library/Cochran_1977_Sampling_Techniques_Third_Edition.pdf (accessed April 7, 2021).
31. *Worry and its Psychological Disorders: Theory, Assessment and Treatment—Google Books*. Available online at: https://books.google.co.ke/books?hl=en&lr=&id=a34y-oRuMOIC&oi=fnd&pg=PR5&dq=worry$+$and$+$mental$+$health&ots=we5DU6wq8u&sig=KLeCnbH5A70LXl6gN_Z5g4_WKOI&redir_esc=y#v=onepage&q=worry%20and%20mental%20health&f=false (accessed April 12, 2021).
32. Sahashi Y, Endo H, Sugimoto T, Nabeta T, Nishizaki K, Kikuchi A, et al. Worries and concerns among healthcare workers during the coronavirus 2019 pandemic: A web-based cross-sectional survey. *Humanit Soc Sci Commun.* (2021) 8:1–8. doi: 10.1057/s41599-021-00716-x
33. Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by healthcare workers due to the COVID-19 pandemic–a review. *Asian J Psychiatry.* (2020) 51:102119. doi: 10.1016/j.ajp.2020.102119
34. Onigbinde OA, Babatunde O, Ajagbe AO. The Welfare of Healthcare Workers amidst COVID-19 pandemic in Sub-Sahara Africa: A call for concern. *Ethics Med Public Health.* (2020) 15:100555. doi: 10.1016/j.jemep.2020.100555
35. Neto MLR, Almeida HG, Esmeraldo JD, Nobre CB, Pinheiro WR, de Oliveira CRT, et al. When health professionals look death in the eye: the mental health of professionals who deal daily with the 2019 coronavirus outbreak. *Psychiatry Res.* (2020) 288:112972. doi: 10.1016/j.psychres.2020.112972
36. Onchonga D, Ngetich E, Makunda W, Wainaina P, Wangeshi D, Viktoria P. Anxiety and depression due to 2019 SARS-CoV-2 among frontier healthcare workers in Kenya. *Heliyon.* (2021) 7:e06351. doi: 10.1016/j.heliyon.2021.e06351
37. Gupta AK, Mehra A, Niraula A, Kafle K, Deo SP, Singh B, et al. Prevalence of anxiety and depression among the healthcare workers in Nepal during the COVID-19 pandemic. *Asian J Psychiatry.* (2020) 54:102260. doi: 10.1016/j.ajp.2020.102260
38. Chew NWS, Lee GKH, Tan BYQ, Jing M, Goh Y, Ngiam NJH, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain Behav Immun.* (2020) 88:559–65. doi: 10.1016/j.bbi.2020.04.049
39. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun.* (2020) 88:901–7. doi: 10.1016/j.bbi.2020.05.026
40. Wilson W, Raj JP, Rao S, Ghiya M, Nedungalaparambil NM, Mundra H, et al. Prevalence and predictors of stress, anxiety, and depression among healthcare workers managing COVID-19 pandemic in India: a nationwide observational study. *Indian J Psychol Med.* (2020) 42:353–8. doi: 10.1177/0253717620933992
41. Albert PR. Why is depression more prevalent in women? *J Psychiatry Neurosci.* (2015) 40:219–21. doi: 10.1503/jpn.150205
42. Zhu J, Sun L, Zhang L, Wang H, Fan A, Yang B, et al. Prevalence and Influencing Factors of Anxiety and Depression Symptoms in the First-Line Medical Staff Fighting Against COVID-19 in Gansu. *Front Psychiatry.* (2020) 11:386. doi: 10.3389/fpsyt.2020.00386
43. Rossouw L, Seedat S, Emsley R, Suliman S, Hagemeister D. The prevalence of burnout and depression in medical doctors working in the Cape Town Metropolitan Municipality community healthcare clinics and district hospitals of the Provincial Government of the Western Cape: a cross-sectional study. *South Afr Fam Pract.* (2013) 55:567–73. doi: 10.1080/20786204.2013.10874418
44. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res.* (2020) 288:112954. doi: 10.1016/j.psychres.2020.112954

45. Özdin S, Bayrak Özdin S. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *Int J Soc Psychiatry*. (2020) 66:504–11. doi: 10.1177/0020764020927051
46. Morin CM, Carrier J. The acute effects of the COVID-19 pandemic on insomnia and psychological symptoms. *Sleep Med.* (2020) 77:346–7. doi: 10.1016/j.sleep.2020.06.005
47. Ferini-Strambi L, Zucconi M, Casoni F, Salsone M. Covid-19 and sleep in medical staff: reflections, clinical evidences, and perspectives. *Curr Treat Options Neurol.* (2020) 22:29. doi: 10.1007/s11940-020-00642-4
48. Si M-Y, Su X-Y, Jiang Y, Wang W-J, Gu X-F, Ma L, et al. Psychological impact of COVID-19 on medical care workers in China. *Infect Dis Poverty*. (2020) 9:113. doi: 10.1186/s40249-020-00724-0
49. Jung H, Jung SY, Lee MH, Kim MS. Assessing the presence of post-traumatic stress and turnover intention among nurses post-middle east respiratory syndrome outbreak: the importance of supervisor support. *Workplace Health Saf.* (2020) 68:337–45. doi: 10.1177/2165079919897693
50. Htay MNN, Marzo RR, Bahari R, AlRifai A, Kamberi F, El-Abasiri RA, et al. How healthcare workers are coping with mental health challenges during COVID-19 pandemic?—a cross-sectional multi-countries study. *Clin Epidemiol Glob Health*. (2021) 11:100759. doi: 10.1016/j.cegh.2021.100759

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.

frontiers
in Public Health

ORIGINAL RESEARCH
published: 04 November 2021
doi: 10.3389/fpubh.2021.576481

Mental Health and Integration: A Qualitative Study on the Struggles of Recently Arrived Refugees in Germany

Lena Walther [1]*, Diana Rayes [1], Julia Amann [1], Uwe Flick [2], Thi Minh Tam Ta [1], Eric Hahn [1] and Malek Bajbouj [1]

[1] Department of Psychiatry and Psychotherapy, Charité University Medicine Berlin, Berlin, Germany, [2] Department of Education and Psychology, Freie Universität Berlin, Berlin, Germany

Introduction: Forcibly displaced people are at particular risk of mental health problems and also face specific integration challenges upon resettlement. Existing literature suggests that there may be a bidirectional relationship between mental health and integration. The present study seeks to understand the relationship between integration processes and mental health problems or significant negative emotional experiences among adult refugees in Germany.

Method: Applying a qualitative approach, we conducted 54 semi-structured interviews with refugees and asylum seekers who arrived in Germany between 2013 and 2018 currently residing in Berlin, Leipzig, or the Duisburg area in North Rhine-Westphalia. Data was collected between December 2018 and September 2019. We analyzed transcripts inductively using thematic analysis.

Results: Five themes covering the various links between integration and mental health problems or significant negative emotional experiences were identified. First, we found that the mental health consequences of past adverse experiences, as well as ongoing worries about those left behind in the homeland, can seriously impede refugees' ability to pursue activities key to integration. Second, the process of applying for and securing asylum can result in uncertainty and fear, which, in turn, burden the individual and may impact motivation for integration. Third, many of our participants described mental health ramifications related to feeling stuck and thwarted in the pursuit of building a life, especially in securing employment. Fourth, some participants described feeling so overwhelmed by fundamental tasks throughout the integration process, namely, language learning and bureaucratic processes, that these take a psychological toll. Fifth, we identified several forms of social disconnection between refugees and members of the host community due to xenophobia, social and cultural differences, physical and emotional isolation in refugee camps, as well as with co-nationals and fellow refugees. Negative emotions, mistrust, and socio-cultural differences that emerge throughout the integration processes seem to erode social cohesion among refugee communities, potentially further threatening mental health.

Edited by:
Wulf Rössler,
Charité—Universitätsmedizin
Berlin, Germany

Reviewed by:
Patrik Roser,
Psychiatric Services
Aargau, Switzerland
Francisco Lotufo-Neto,
University of São Paulo, Brazil

***Correspondence:**
Lena Walther
lena.walther@charite.de

Specialty section:
This article was submitted to
Public Mental Health,
a section of the journal
Frontiers in Public Health

Received: 26 June 2020
Accepted: 07 September 2021
Published: 04 November 2021

Citation:
Walther L, Rayes D, Amann J, Flick U,
Ta TMT, Hahn E and Bajbouj M (2021)
Mental Health and Integration: A
Qualitative Study on the Struggles of
Recently Arrived Refugees in
Germany.
Front. Public Health 9:576481.
doi: 10.3389/fpubh.2021.576481

Conclusion: Mental health problems and integration processes appear to be closely related across different areas of integration. Innovative solutions to challenges identified by members of the refugee community in Germany stand to benefit mental health and integration outcomes simultaneously.

Keywords: refugees, asylum seekers, migration, mental health, well-being, integration, qualitative study

INTRODUCTION

The integration of refugee and asylum-seeking populations (henceforth referred to as "refugees") is a pressing challenge for host societies worldwide. While the concept of integration has been extensively debated in the literature (1–3), it can be understood to represent a "process of becoming an accepted part of society" [(4), p. 11]. This process is multidimensional, encompassing legal, political, economic, social, and cultural dimensions (4, 5). It is also increasingly seen as a bidirectional process involving both migrant and host society communities (6). For refugees, integration can be particularly challenging (7) because, unlike other migrants, refugees are often unable to plan their futures or choose their destinations. They also face several structural barriers in the host country context, including uncertainty regarding residency status and discrimination.

Within their prominent framework for refugee integration, Ager and Strang (2) position health as one of the "markers and means" of integration (p. 170). More generally, it has been posited that health, including mental health, is a prerequisite for integration as well as a positive outcome of successful integration trajectories [e.g., (8)]. Refugees who resettled in Western countries have repeatedly been found to be at particular risk of poor mental health (9–12), showing high prevalences of symptoms of depression, anxiety disorders, and PTSD (13–16). While past research has focused on mental health problems as a consequence of traumatic experiences in pre-migration contexts or during migration [e.g., (17, 18)], it is now recognized that post-migration living conditions, including the circumstances and processes of integration, are also linked to mental health outcomes [e.g., (19)].

Previous, mostly quantitative research has identified a range of associations between various mental health measures and different aspects of integration. These include legal matters such as status insecurity (20), challenges around family separation and reunification (21, 22), socio-economic stressors such as poor housing conditions (23), unemployment [e.g., (24)], as well as social and interpersonal stressors such as host country language learning (25) and discrimination experiences (26). While most research has emphasized the impact of post-migration conditions on mental health (19), fewer explicitly consider the opposite effect: the effect of poor mental health on the processes of integration (27–29).

Qualitative approaches, which have been under-utilized in the study of refugees' experiences (30, 31), are ideally suited to delving deeper into the nuances of potential associations between integration and mental health. They are better suited than quantitative approaches for illuminating mechanisms behind these associations, providing insights at a level of specificity that is close to lived experience, and identifying previously unknown challenges by allowing individuals from the community under study to give their personal accounts (30–33). In mental health research, qualitative studies can contribute to a more specific understanding of what individuals are experiencing than standardized symptom checklists (33), which is particularly valuable in a cross-cultural research setting. Existing qualitative studies on refugees' experiences regarding the relationship between mental health and integration have explored specific domains of integration, such as housing (34) and social integration (35), full ranges of stressors and mental health ramifications (31, 36), and overall integration experiences with insights on well-being (37, 38). However, we have not come across qualitative analyses focused explicitly on the link between integration processes and mental health struggles. Our study addresses this relationship in a diverse sample of refugees within their first 5 years in Germany.

Germany is among the five countries globally that have received the largest number of refugees, with ~1.1 million living within its borders in 2018 (39). Just over half of refugees who arrived in Germany at the height of the influx were of Syrian (41.5%) or Afghan (9.8%) nationality (40). With 890,000 new registrations by refugees in Germany in 2015 alone (41), refugee integration became a focus of political and public discourse (42, 43) against a backdrop of anti-refugee sentiments on the rise (43). One cornerstone of integration policy in Germany is the asylum procedure, which can take several years including appeals due to a large number of asylum applications. There are several different types of residence status, with varying durations and levels of access to institutions (44). Providing housing has also proved a challenge: for up to 6 months, new arrivals are placed in refugee camps; then, municipal governments are responsible for providing housing, usually in shared refugee housing facilities (45). Finally, efforts have been made to ease major aspects of structural integration, namely integration into the workforce or education programs, with first steps taken to tackle bureaucratic obstacles like certificate recognition and legal restrictions (46). "Integration courses," which provide language and civics instruction, are essential in this process; however, access is not guaranteed due to high demand (47).

The present study offers detailed insights into the relationship between integration and mental health struggles among refugees who arrived in Germany during the peak influx years between 2013 and 2018 and resided in one of three urban areas—Berlin, Leipzig, or greater Duisburg—at the time of the interviews. Various aspects of building a new life in Germany and a range of mental health problems or significant negative emotional

TABLE 1 | Sample characteristics.

Gender	Female	Male					
	24	30					
Age	18–24	25–29	30–34	35–39	40–44	45–49	50–55
	11	13	12	5	5	3	5
Country of origin	Syria	Afghanistan; Afghanistan/Iran	Iran	Pakistan	Palestine	Libya	Sudan
	36	9	4	2	1	1	1
Level of education	No secondary education	Secondary education	Started university in country of origin	University-educated	Young and currently in secondary education	N.A.	
	5	3	9	28	3	6	
Residence in Germany	Berlin, Berlin	Leipzig, Saxony	Mülheim an der Ruhr, Duisburg, or Dinslaken, North Rhine-Westphalia				
	39	4	11				
Year of arrival in Germany	2013	2014	2015	2016	2017	2018	
	1	1	34	11	6	1	
Legal status	Refugee or asylum status	Subsidiary protection or deportation ban	Unresolved	Humanitarian program	Family reunification	Visa sponsorship	N.A.
	25	10	11	1	3	1	3
Housing	Private	Housing facility	N.A.				
	30	15	9				
Occupation	Gainfully employed	In education	None				
	13	11	30				

experiences reported by participants were examined. We aim to provide insights to integration and health policymakers, health care providers, and researchers, particularly in light of recent changes in asylum-seeking and integration policies in the German context.

MATERIALS AND METHODS

Participants and Sampling

The study sample included 54 participants living in urban parts of Germany, including Berlin, Berlin; Leipzig, Saxony; Mülheim an der Ruhr, Dinslaken, or Duisburg, North Rhine-Westphalia, Germany (see **Table 1** for sample characteristics). These locations were chosen to capture experiences from cities of different sizes from former East and West Germany. Recruitment from rural areas was not attempted due to logistical constraints, including the need for in-person access for interviewers and the limited size of the refugee population in rural areas. Participants were recruited through community outreach via social media and refugee organizations (see **Appendix** for advertisement) and snowball sampling. Our single inclusion criterion was having arrived in Germany in 2013 or later through forced migration (self-identified). We became increasingly selective in our recruitment to pursue the goal of maximum variation sampling (48) by age, gender, educational background, and country of origin. We continued recruitment until these sampling goals were achieved. Of the people initially interested in participating, 31 either withdrew or were excluded due to not meeting the inclusion criterion.

In the Results below, participants' ages are given within a 5-year range with each quote, gender is given in capital letters "F" or "M" behind the age (e.g., "30–35F"). When the country of origin or another attribute is important to name, participants' genders are obscured, both in the text ("they") and in the codes behind quotes (e.g., "age 30–35") to protect their identities.

Topic Guide

The topic guide (see **Appendix**) comprised a brief introductory section on migration history and living situation, and two main parts: one on cultural experiences, the second, which is the focus of this work, on mental health and emotional experiences. The topic guide has a broader scope than the present study because the interview study as a whole was part of a larger collaboration project. The present study is one of several investigations based on this data [see (49) on resilience among refugees]. We used general terms ("feelings"; "well-being") to discuss mental health with participants to prevent stigmatization or hesitation in sharing personal thoughts. We followed general recommendations for constructing topic guides for semi-structured interviews [e.g., (50, 51)] and consulted community members regarding the best terminologies to describe mental health and well-being. A partial, preliminary version of the topic guide was piloted in eight interviews not included in this study. Some additional questions were added to the topic guide after the first few interviews.

Data Collection

The interviews were conducted between December 2018 and September 2019 in Berlin, Leipzig, and Mülheim an der Ruhr, Germany. Semi-structured in-depth interviews were conducted face-to-face and mostly with individual participants. In a few cases, partners or translators were present (one interview of two brothers was analyzed as two separate interviews because both answered the questions). All interviews, except one, were audio recorded. Interviews took place at locations of participants' choosing (mostly quiet locations within public cafés).

Seven different interviewers conducted the study: a female Arabic-speaker (DR, Master of Public Health), a male Arabic-speaker with refugee status (sociologist in MA program), a male Farsi-speaker (professional translator in psychiatry setting), and four German- and English-speaking interviewers (psychologists and sociologists, MA, MSc, or BSc, including LW and JA). We instructed interviewers on the main study goals, interviewing practices, and the ethical framework.

Interviews were conducted in Arabic (23), Farsi/Dari (10), German (19), or English (3). Participants were able to choose the interview language and were matched with interviewers accordingly. Gender or other features were not taken into account in matching interviewees and interviewers; however, interviewees were aware of the gender of their interviewer before the interview. In the Duisburg area, the presence of a translator was required for some interviews because a German- and English-speaker conducted all of the interviews there. Beverages were purchased for participants, but there was no financial compensation. Most interviews took between 45 and 60 min; the shortest interview took ∼30 min, the longest was around 90 min. The audio recordings were transcribed and translated into English or German by either the interviewers or external professional translators. To ensure the quality of the transcripts, we commissioned professional translators without previous study involvement to check a randomly selected interview by each transcriber.

Data Analysis

We applied thematic analysis following Braun and Clarke's (52) guidelines to identify and organize patterns in our data. For data immersion, LW and JA read through all the transcripts. Next, we coded transcripts line-by-line for the second part of the interview and data segments that were pertinent to our primary research question in the rest of the transcripts. In the interest of validity, LW and JA independently coded half of the transcripts each, exchanging transcripts after about every five, discussing and amending codes. The data analysis was inductive for the most part. It was only deductive in the sense that we approached the data with the overarching research question "how do integration processes and mental health relate?" in mind.

Our codes were open and detailed enough to represent the meaning of the text segment accurately. After the initial coding of each transcript, we entered information on each participant into a table, including sociodemographic and migration background information, a summary of the interview, as well as a mental health status summary. The mental health status summaries included explicit mentions of mental health problems or treatment history by participants, as well as an assessment of overall functioning and well-being based on the interview content as a whole. Their purpose was to ensure that individual interview excerpts would not be taken out of context in the analysis. For example, a statement about a stressor by an individual whose interview reflected very high levels of well-being overall was not read as equally indicative of an integration process negatively relating to mental health as a similar statement by a struggling individual.

After coding all interviews, LW identified candidate themes revolving around the central research question by going through codes systematically and entering them into evolving theme maps in MAXQDA's visualization toolkit with feedback from JA. We continuously referred to the transcripts and our summary table to ensure including an across-case and a within-case view of context (53). While the results only include a few examples of a within-case perspective, individual interview passages were interpreted with regard to the case as a whole. Collaborators from the community under study critically assessed the themes for plausibility, and we refined them until a final thematic map (Image 1) was agreed upon.

Identification of Mental Health Problems

All explicit mentions of mental health conditions or symptoms, such as "psychological problems," depression, anxiety, trauma or post-traumatic stress, nightmares, or trouble sleeping, were regarded as indicative of mental health problems pertinent to our analysis, as were statements by participants expressing significant negative emotional states or experiences, including expressions of deep or lasting sadness, worries or rumination, exhaustion or listlessness, apathy, anger, fear, frustration, hopelessness, emptiness, overwhelm, loss of self-esteem or self-worth, loss of motivation, social withdrawal. In other words, our study explored the whole spectrum of poor mental health, not just the clinically significant end (54). This broad view is necessitated by the study design, which relies on participants' subjective expressions of experiences. We also attended to mechanisms that could cause or exacerbate mental health problems and make these instances explicit in the analysis.

Concept of Integration

We considered all processes involved in arriving and building a new life in Germany mentioned by our participants as integration processes in our analysis, including, for example, legal processes, the housing journey, learning languages, navigating everyday life, interactions with cultural differences, pursuing education, employment, and other activities for oneself and others in the family, social life, experiences of interactions with key administrative institutions, feelings of inclusion and belonging, developments in one's sense of identity.

Reflexivity

The study team included researchers of different ages, genders, levels of seniority, cultural backgrounds, as well as disciplinary backgrounds, including psychology, psychiatry, sociology, and anthropology. Furthermore, we consulted members of the community under study in the thematic analysis process: preliminary results were presented at a workshop and critically discussed.

Associations between integration processes and mental health struggles experienced by refugees in Germany

Themes		Sub-themes
Theme 1	Impaired by past and present events in the homeland	**1.1. Past adverse experiences** *"My brain is full of knots that take all the energy I need to start my day, learn the language, make contacts."* **1.2. Worries about those left behind** *"Your family is not safe, so you keep being afraid, obsessed"; "I'm stuck in Syria, maybe that's why I can't learn."*
Theme 2	Weighed down by legal uncertainty	**2.1. Uncertainty and fear during the asylum process** *"Uncertainty was most dangerous feeling"; "Shocked that even Germany could put me back in danger."* **2.2. Impact of legal status uncertainty on integration** *"The possibility that I will be told to go back after all my efforts hinders progress and enthusiasm to do anything."*
Theme 3	Feeling stuck and thwarted: mental health ramifications of struggles with structural integration (esp. finding work)	**3.1. Frustration over feeling stuck and directionless** *"Refugees' depression is because they can't achieve much. They try, but not much works"; "Cannot live without a goal."* **3.2. Feelings of loss of agency, status, and being undervalued** *"My life is imposed on me"; "I don't feel people here care about the young people who came with their huge potentials."* **3.3. Psychological burden of involuntary inactivity** *"Depressed because I am doing nothing"; "Don't feel important anymore"; "They say we're lazy"; "They don't see reality."*
Theme 4	Overwhelmed by fundamental tasks of integration	**4.1. Language learning** *"My psychological problems come from pressure to learn"; "Punishment for people who have never studied."* **4.2. Administrative tasks and bureaucratic processes** *"Refugees arrive emotional, need a bit of motivation, but there is nothing but bureaucracy tac tac tac."*
Theme 5	Social disconnections with host society and fellow refugee communities	**5.1. Experiences of xenophobia and racism** *"Feeling that one doesn't belong results in loss of motivation, withdrawal"; "They don't want me"; "I don't feel safe."* **5.2. Perceived lack of close-knit social networks in Germany** *"I don't feel people are happy here. They don't visit each other. I'm afraid to become like them"; "Friendships are cold."* **5.3. Lack of social support and feelings of community** *"Exhausted"; "I am not allowed to fall in Germany because no one will catch me. It is very stressful."* **5.4. Isolation in refugee camps** *"Isolating refugees in camps after all their suffering. They are let down. Not all of them get over it."* **5.5. Lack of social cohesion within refugee and migrant communities** *"They have their own problems"; "Conversations always negative"; "Some don't deserve asylum"; "I get a lot of criticism."*

FIGURE 1 | Thematic map. Quote segments in italics are abridged and partly slightly reorganized for brevity; semi-colons separate utterances by different participants.

RESULTS

We identified five themes, each with sub-themes (**Figure 1**). Theme 1 is clearly about poor mental health impacting integration unidirectionally. Themes 2 and 5 are mixed. Themes 3 and 4 are predominantly about the impact of integration processes on mental health, but they also capture several concomitant negative repercussions for integration and integration struggles exacerbated by mental health problems or negative emotional states. As the results below show, illustrating the relationship between mental health and integration separately for different areas of integration ended up being a central organizing principle in the thematic analysis due to the specific mental health and integration connections we found within each.

Each theme is described using quotations from the interview transcripts. The most illustrative expressions of an experience or multiple expressions that capture different facets of an experience were selected in order to reduce redundancy and provide a rich picture of the data.

Theme 1: Impaired by Past and Present Events in the Homeland

This theme addresses how mental health problems linked to pre-migration adverse experiences (sub-theme 1.1.) and worries about the homeland and family members left behind (1.2.) can result in overall functional impairment and impede activities key to integration.

1.1 Past Adverse Experiences

Several participants described feeling unable to tackle various aspects of their integration process because of poor mental health attributed to adverse or traumatic experiences before and during flight. For example, one participant (50-55F) attributed her language learning difficulties to past experiences: "I doubt I will ever learn this language. It is too hard for me because I have psychological problems. I've experienced so many problems in life. I can't just forget them. My brain doesn't have the capacity to learn so much at once."

Another participant (30–34 M) who experienced traumatic events throughout his life in his country of origin reported feeling unable to "try to integrate" into German society "with a clear mind" until he has received therapy. He reported suffering daily from suicidal thoughts and nightmares concerning his experiences prior to arrival in Germany: "My brain is psychologically full of these knots. [. . .] like in a vicious cycle, these [psychological problems] take all the energy I need to start my day and stay on my shoulders like a heavy weight. [. . .] I still feel the pain even though I'm in Germany. This feeling takes all the energy I need for learning the language and for making social contacts."

In a statement generalizing these deleterious effects of past adverse experiences, a Syrian participant (age 25–29) said that they have "noticed [. . .] the Syrians [. . .] have a kind of general depression, even if they don't want to admit it" from the war. They reported that this depression makes them "[lose] the ability to do anything" as soon as they encounter obstacles in their attempt to have a purposeful day. These sentiments were echoed by another Syrian participant (age 45–49) who says of themselves and their fellow Syrians, "We are devastated [. . .], 7 years of war—we are psychologically destroyed." They, too, feel they were "made unable to do things" by "the horror that [they] experienced in Syria and the fear of losing [their] children, the things [they] saw."

1.2 Worries About Those Left Behind

Some participants also feel impaired by concerns about family members still living in their country of origin: "My mom and my brother are still in Syria, so my head is full! I have no activities" (age 45–49). These worries have the potential to prevent refugees from overcoming their pasts and give rise to guilt and rumination: "When you come to Germany alone, you are safe then, but your family is not! So, you keep on being afraid, the same worries! [. . .] because I came here, and I am in exile and left them, it became like an obsession to me [to check on them]" (25–29 M).

Intense and debilitating worries about the homeland and fellow citizens left behind, not just family members, were also reported by some participants. Continuous checking of the news is common among these participants, making them feel as if they are not rooted in their present circumstances and isolated from those around them, even co-nationals: "I am not out of Syria yet [. . .], I'm still stuck there, and I use the internet in the morning to check the Syrian news, I listen to the radio about what is happening in Syria, and this is what my Facebook is all about, too. I can't forget and just start here [. . .]. Maybe that's why I'm late learning the language, or that's why I can't remember words that I learn. [. . .] Everyone around me asks me to get out of this grief, but [. . .] I don't understand these people, sometimes I think they were not in the same war [. . .]" (age 50–55).

Theme 2: Weighed Down by Legal Status Uncertainty

The asylum process is central to refugees' post-migration experience since it determines access to various institutions, freedoms, and the right to stay in Germany. This central legal process of integration is bound up with distress due to uncertainty and fear (sub-theme 2.1.), and the burden of uncertainty has the potential to impact other areas of integration (sub-theme 2.2.) negatively.

2.1 Uncertainty and Fear During the Asylum Process

Many of our participants reflected on the asylum process as a major stressor. Some participants expressed lasting distress over what happened during their asylum hearing, including regrets over what they said and inadequate translation in the hearings. However, the most significant mental health impact of seeking asylum among our participants is the burden of uncertainty that accompanies the process: "Until [you have an answer], you will always have fear. Always, [. . .] It was uncertainty in my life that I considered the most dangerous feeling in my life. [. . .] Since we had this positive answer [regarding our asylum application], yes, I am very happy, I don't take my medicines anymore" (25–29F). The duration of this phase of uncertainty and the relentlessness of the accompanying stress was emphasized. According to one participant (35–39F), "all people are psychologically tired" from hearing a succession of updates about their status "for a year, 2 or 3 years" - even after having been granted a title, waiting on the decision regarding its renewal.

The perceived lack of influence over the outcome of the asylum process, which can be understood as a loss of agency, was also highlighted as particularly challenging to deal with: "This burdens me immensely—not being able to do anything [to impact the asylum process] and just waiting to see what will happen" (25–29 F).

One participant (30–34 M) exhibited a severe fear of deportation. He reported not having been granted the complete protection status that he was expecting to receive. He "no longer feel[s] safe" and is shocked that "even Germany could put me back in danger." His fear of deportation was exacerbated by previous traumas from political persecution and violent conflict, losing friends and relatives: "All my days are getting the same pattern where I get nightmares about [country of origin], or fears that I will get deported. [...] Constant fear, anxiety, and nightmares."

2.2 Impact of Legal Status Uncertainty on Integration

The adverse mental health consequences of the uncertainty surrounding legal status can reduce the ability to perform tasks essential to integration. A participant (30–34 M) with severe fear of deportation said that "the stress takes everything out of" him and "doesn't give him the chance to feel that [he] wants to do any activities." Another participant (18–24 M) reported experiencing symptoms of forgetfulness as a consequence of 4 years of uncertainty regarding his legal status that were "psychologically taxing."

Furthermore, several participants described the lingering uncertainty itself as lowering their motivation to build a life in Germany: "The possibility that I will be told to go back after all my efforts here hinders progress, achievement and enthusiasm to do anything" (30–34 F). This quote also demonstrates how the possibility of being sent back can make refugees feel undervalued in their contributions, and "after all this effort [. . .] feel still not accepted" because of the impression that Germany is "thinking about how to send us away" (18–24 F), threatening the sense of belonging to German society.

Theme 3: Feeling Stuck and Thwarted: Mental Health Ramifications of Struggles With Structural Integration

A large cluster of stressors and associated psychological problems centers around a perceived struggle with structural integration, which here is short for: participation in the host country labor market and educational programs, facilitated by language and integration courses (although in some integration frameworks, it also includes legal dimensions and housing [see e.g., (55)]). Many of our participants expressed feeling unable to accomplish various aspects of structural integration. Restrictions on access to language courses and work permits due to legal status were frequently mentioned obstacles. Problems with the acceptance of certificates or otherwise seeing no future for one's profession in Germany as well as a perceived lack of guidance or too many restrictions (e.g., from the employment agency, "Job Center") were also frequently mentioned, as were concerns about slow progress in language skill acquisition. Finally, several participants reported feeling held back by housing conditions impeding their pursuit of structural integration goals [e.g. "I wanted to study, but without an apartment and without privacy, I had to cancel everything. [...] If I can't even sleep in peace, how am I supposed to work?" (18–24M); "I got the B1 certificate [...] despite the conditions in the housing facility, which I cannot describe" (35–39F)].

The challenges of structural integration were related to a myriad of mental health consequences by our participants. Many attributed feelings of depression to feeling stuck and without direction (sub-theme 3.1.), a loss of agency, status, and a sense of being valued (3.2.) and felt burdened by involuntary inactivity because of slow structural integration (3.3.). This theme captures how integration processes impact mental health, and participant perspectives quoted in this section also strongly suggest the potential for vicious cycles wherein frustrations demotivate and make integration even harder in turn.

3.1 Frustration Over Feeling Stuck and Directionless

Some participants attributed depression among refugees to frustrations over feeling unable to start a life in Germany, more so even than to past traumatic experiences: "[The other refugees] are suffering a little bit from depression. [. . .] Not because of the war. It emerged here. Because of the difficulties, they can't achieve much [. . .]. They try, but not much works out [pause] that's why" (30–34M). Indeed, several participants expressed feeling they have "accomplished nothing" (30–34F) or are "not developing" (18–24M) in their years in Germany, highlighting that career ambitions do not recede into the background in the flight context, especially among those of prime working age. Several participants in their thirties reported feeling under pressure to build a new career quickly. One participant (30–34F) considers "morning depression [. . .] a must" because she is "already" in her thirties and has "no career [. . .] because [her] university degree is irrelevant here."

The lack of direction that comes from an inability to build an active life can itself represent a source of pressure. One participant felt that she struggles because she "cannot live" without a goal, that pursuing challenges "is life" (45–49F). Another participant (age 40–44), who reported seeing no future for her job in Germany, suffers from attempting to pursue goals while feeling a lack of direction: "I'm not pleased with my life here. I don't have a plan. I don't know what the plan for tomorrow is. Keeping going without destination, plus my other problems, makes me feel so tired."

The burden of having no goals to pursue has troubled some refugees for many years, even the entire period of their displacement: "I've been suffering for the last seven years for not knowing where to go, what to do, [. . .] I had to visit a therapist" (35–39M). As this quote shows, aimlessness from losing an established career might be compounded by uncertainty about "where to go" and doubts about "whether it was all worth it," as another participant who experienced a high-risk flight journey described (35–39M). For many participants, starting life in Germany is much more complicated than expected: "The first months were sadness because it was all different from the utopia we had in our heads. [. . .] Our dreams were shattered" (25–29F).

3.2 Feelings of Loss of Agency, Status, and Being Undervalued

A perceived absence of progress in the structural integration process can also mix with a sense of injustice or lack of agency for refugees: "My life in Germany is imposed on me. If I can't establish anything for myself here, I will be more frustrated" (40–44F). Some perceive unforeseen bureaucratic restrictions as an affront to their sense of agency: "That they're not giving me a work permit or forcing me to do a particular job feels like imprisonment and that stresses me" (40–44F, different from previous). This feeling of a loss of control can erode an initial sense of motivation: "When I came to Berlin I had the plan to learn the language, and other plans to start my life here, it was a solid plan, but I couldn't do it. The Job Center did everything, I felt like I didn't have my own choice" (25–29M). Restrictions on movement were also mentioned as playing into a feeling of imprisonment and being thwarted.

Several participants described anxiety over a perceived loss of status due to not finding a next step suitable to their backgrounds. This prospect is potentially so unacceptable to some that it depletes their motivation. One participant spoke of friends and acquaintances who are unwilling to integrate because "they did a lot in their country of origin and now they have to start from 'zero,' and that is not ok for them" (25–29F). A fixation on the perceived loss of status can also be demoralizing: "I know a few people who always think about what was in Syria, what they studied, what [. . .] and now they can't find their way in Germany. It's so hard" (30–34M).

Furthermore, not finding a purposeful activity and not feeling supported in the search for one are sometimes accompanied by a sense of not being valued by the host society. A young male who reported having "a lot of energy" and was eager for employment opportunities feels that his Job Center representative simply "forgets" about his case: "I don't feel really that in Germany people care about the young people who came with their huge potentials, care to guide them in the right direction" (25–29M). Some participants also feel undervalued during the structural integration process due to the "arbitrariness" of not being "allowed to do these things that others are" (30–34M), when they are restricted (in these cases: language course participation) and others are not: "I don't have any rights [because I don't have legal documents]. I was like a number, a file, and that's it. Not a person, but a file" (30–34M).

3.3 Psychological Burden of Involuntary Inactivity

Several participants explained that the obstacles to building a life in Germany, such as lack of access to work and language courses, can lead to involuntary inactivity. Housing conditions were also emphasized as forcing inactivity: "Go to a camp, and you see how families live [...]; they sit and watch TV all day, not because they want to" (35–39M). Inactivity, in turn, comes with deleterious mental health consequences, according to our participants. One participant stated that "most people get depressed" upon arrival in Germany because of the "very long waiting time to be able to do anything. This wait kills" (30–34F) and the concomitant loss of self-worth: "This feeling was continuous [before psychotherapeutic treatment]. A feeling that I'm not important [anymore]." Another participant reported: "I am depressed [...] because I am sitting at home doing nothing" (40–44M). Several male participants described suffering from rumination because of a lack of activity and missing work as a distraction, "especially as someone who worked like a machine his whole life" (30–34M).

Showing that some refugees may have experienced the burden of lacking purposeful activity for extended periods before their arrival in the countries they settle in, one participant counted years of "sitting and doing nothing" (35–39M) in various countries on his way to Germany. "Feeling[s] of meaninglessness [...] which are maybe bearable for a year" (30–34M) and anger about "life just pass[ing] by" (30–34M) result from months and years spent doing "absolutely nothing." Even for those enrolled in language and integration courses, the waiting time until the next course begins poses a mental health challenge: "I had depression or something, doing a language course, waiting for the result, then a 2-month wait for the next course, doing nothing" (25–29M).

A pernicious added layer to these frustrations is a feeling of shame about receiving social benefits and the worry that their involuntary "sitting around" will feed into prejudices against refugees: "The people who don't like refugees, they say things like we are lazy and just sitting around our houses, but we are not" (30–34F). Some feel helpless in reacting to these judgments in light of how difficult they find building a life: "What can I do? People say: 'Oh, he just wants to sit around.' They don't see the reality" (30–34M). These feelings often co-exist with discomfort about receiving social benefits: "I don't like taking money from someone and then also have that be constantly be held against me" (40–44F), which many also attribute to not being familiar with social benefits as an institution from their home country.

Finally, it is of note that frustration over difficulties with structural integration and sitting around can lead to mental health problems, making it even harder to become active. One participant told us: "There's a fine line between you and giving up, as a refugee" (35–39M). Another participant (25–29M) suggested that there should be mental health check-ins at Job Center appointments to counteract this vicious cycle.

Theme 4: Overwhelmed With Fundamental Tasks in the Integration Process

Fundamental daily tasks of integration include learning the host country language(s) (sub-theme 4.1.) and navigating the administrative processes (4.2.) involved not only in the asylum process but in everything from securing social benefits and housing, to getting certificates recognized and enrolling in courses, to seeking medical care. While many participants spoke about the stress of struggling with these tasks, they appear to have the potential to become so overwhelming that they impact mental health for some. This theme also includes examples of consequent withdrawal as well as mentions of poor mental health exacerbating everyday stressors.

4.1 Language Learning

Almost all of our participants mentioned learning a new language as a primary stressor. For some participants, this stressor can take a significant psychological toll. In particular, refugees with limited educational backgrounds can experience learning German as severely distressing, especially those who are illiterate in their mother tongue: "I'm learning German and, in parallel, I'm trying to learn to write words in Persian [...]. I think my psychological problems come from a pressure to learn. I think about it a lot" (age 40–44).

One participant criticized the German integration scheme for failing to "know the circumstances of the world" in sending people who have "never studied in [their] whole life" to standard integration and language courses (50–55F). Another said: "It is like a punishment to them, being sent to an integration course. [...] Some of them had to visit a psychotherapist. So, imagine how much they suffered that they needed to visit a doctor for it" (40–44F). Mothers of young children reported stress due to lacking the time and space to study. Older age can also exacerbate the difficulties associated with a limited educational background: "And their ages range around the forties. Age plays a big role in language learning" (40–44F), and feelings of alienation can emerge from hopelessness about learning: "He [older, less educated acquaintance who is "in crisis"] doesn't understand a thing. He always feels estranged" (18–24M).

As addressed in Theme 1, pre-existing psychological issues can also be a reason for feeling overwhelmed with language learning. One participant (25–29M) felt unprepared to attend a language course because his "psychological status was not great" due to acute worries about his family and a stressful living situation in a housing facility. He demanded that these circumstances should be taken into account by Job Center and language program staff. The status quo, he feels, simply forces people to "go and fail."

4.2 Administrative Tasks and Bureaucratic Processes

Another facet of integration that was identified by almost all participants as a major stressor and by some as a cause of feeling psychologically overwhelmed was bureaucracy. The sheer number of bureaucratic processes [“Germany is the country of papers and bureaucracy. Always papers and appointments” (30–34F)], their incomprehensibility [“the language can’t even be understood by Germans” (50–55F)], and the lack of assistance for foreigners [“structures and processes that do not exist in Afghanistan or Iran, […] and no one is there to advise you” (age 25–29)] are nearly ubiquitous sources of frustration.

For some participants, this stress from bureaucracy sounds as though it is of a severity that is pertinent to mental health: “[Bureaucracy] causes me tension in that a hundred ideas must be present in my head to perform 100 tasks every day” (30–34F), and as a consequence also to integration processes: “When I got that letter, I didn’t understand anything in class all day because I just keep thinking about the letter. I had nothing but stress […]. This happens a lot” (40–44F). Everyday pressures also impede some refugees’ efforts to overcome mental health struggles by pursuing meaningful activities: “Depression … I feel negative most of the time. I am trying to break through this negativity. […] Every morning after I get up, I tell myself, ‘today, I’m going to start something new’. But after you are faced with all these bureaucracies and pressures such as learning the language or not knowing what’s going to happen tomorrow” (40–44F). One participant highlighted that bureaucratic demands can be particularly overwhelming immediately after arrival, when mental health is frail: “Refugees […] come from war and are very emotional, need a bit of motivation, but there is nothing but bureaucracy at the beginning, tac tac tac” (25–29M).

The stresses of bureaucracy sometimes interact with family dynamics. For example, one participant who struggles with a sense of overwhelm feels additional despair about not having achieved reunification with her husband because he was responsible for the family’s administrative affairs in the past; this would “unburden” her. A few participants reported relying on their children to tackle bureaucracy because of their superior comprehension skills. One young participant (age 18–24) moved out of their family home because this responsibility became too stressful and all-consuming.

Feelings of being overwhelmed with bureaucratic processes can also arise from feeling mistreated and thwarted by administrative bodies. Several participants expressed finding them arbitrary and untrustworthy: “I have only heard lies from administrative bodies so far. They say one thing and do another. They use your statements […] against you” (40–44F). These negative experiences can have consequences for well-being, motivation, and integration: “It’s even gotten to the point where, because of these problems [“they treat you as they wish”], I am less willing to make contact with people. This naysaying by administrative bodies makes me think, ok, then I guess nothing is possible, and I no longer make any effort at all. […] The poor treatment by authorities influences my thoughts and the rest so much that I let them out as anger toward my wife and my children. Or my wife says, ‘let’s go somewhere,’ and I don’t feel like it and say I have a headache” (30–34M).

Theme 5: Social Disconnections With the Host Society and Fellow Refugee Communities

This theme captures various forms of social disconnection, showing links between the social aspects of integration and mental health. Regarding social integration with the host society, it covers experiences of xenophobia (sub-theme 5.1) and how participants experience an absence of close-knit family and other networks (5.2.), and thus, a lack of social support in Germany (5.3.), as well as particular risks from isolation in refugee camps after arrival (5.4.). This part of the theme captures instances of social disintegration negatively impacting mental health as well as this distress resulting in further withdrawal and demotivation.

Our understanding of social integration is not limited to examining the “bridges” between refugees and members of the host society (56). We also consider “bonds” within the refugee community and between migrant co-nationals to be vital parts of integration and a potentially significant source of support and solidarity. Therefore, this theme also addresses different forms of erosion of social cohesion among refugees and co-nationals, including stress and negativity from pre- and post-migration struggles, mistrust due to asylum status anxiety, and conflicts because of how some change their attitudes and behaviors in Germany (5.5.). Here, worries and mental health struggles, many related to integration, are shown to threaten social integration, potentially further jeopardizing well-being.

5.1 Experiences of Xenophobia and Racism

While most participants characterized their reception in Germany as overall acceptable, even positive, or at least ambivalent, almost all participants reported experiences of xenophobia. This facet of exclusion and disintegration has the potential to act as a major stressor. According to our participants, slurs such as “Go back to your country!” (30–34M), “Why are you here?” (25–29M), and “Asylee!” (35–39F) from strangers in public spaces are not rare occurrences. One participant said that reading discriminatory headlines about refugees committing crimes makes him feel he does not want to go outside: “I cannot live well, I cannot walk on the street without thinking that others are looking: he’s a refugee” (25–29M). Female participants perceive the hijab as a central source of discrimination: “Not everyone in Germany is racist, but the majority are, and I’m suffering from this, especially since I’m a woman who’s wearing a hijab” (35–39F). One woman avoids public transport as a hijab-wearer for fear of “harassment from drunk people” (50–55F).

In personal encounters, our participants described facing false perceptions of themselves as “backward thinking, closed-minded extremists” (25–29M), “lower-level” (18–24M), and “barbaric” (25–29M) and always “having to prove yourself [as well-meaning]” (30–34F). Showing that discrimination is also experienced in interactions with actors involved in the integration process, one participant reported being in the midst of a discrimination complaint against the heads of her refugee housing facility for feeling looked down upon and ignored (25–29F). A German-language teacher supposedly told her students, "'honestly speaking, I don't like Arab men'" (40–44M).

On a political level, the rise of far-right, anti-immigrant sentiments in the German political landscape was mentioned as a concern by several participants: "There are AfD and NPD [far-right political parties] campaign posters that you see here that cause a deep-seated fear in migrants who can read German. This leads to stress and worries" (18–24M). Another said that being used as "pawns" in the political game between all parties "is really awful for us" (25–29M), a sentiment closely echoed by another participant who said that as a consequence of the treatment of refugees by the media, "we feel forced on people" (25–29M).

A few interviewees attributed almost all of their negative emotions and mental health struggles in Germany to feeling rejected and discriminated against. For example, a young woman (age 25–29) said that she "senses a hatred from the German people" and has "often been treated badly." She described walking into her workplace in the mornings and having her greetings ignored by her German colleagues while observing that they do greet other Germans. Her predominant feelings in Germany have been "loneliness, hopelessness, isolation." She talked about suffering from depression and feeling unable to engage in activities outside of work, connecting her poor mental health to the rejection she experiences: "The feeling that one doesn't belong here results in a loss of motivation, in being less active and in withdrawal."

A young participant (age 18–24) who fled alone and attempted suicide in Germany said that they initially thought that "countries in Europe like Germany are safe places, where you can feel at peace." They were shocked by what they found, having experienced several racist attacks, including a physical assault and an attack on the housing facility they lived in: "When I arrived, I realized that it's the opposite. Here there is racism; the lack of support is omnipresent. Everyone wants to succeed, but they put obstacles in your way." This feeling of being discriminated against and unwanted had severe consequences for this individual's attitude toward integration, which they see as a process that has to be reciprocal: "I tried to integrate into this society, but they didn't want me to. [...] If they don't want my integration into this society, then I don't want it either." This participant said that "all of these difficulties" led them to attempt suicide because "someone who is not adult and in puberty is more easily hurt in their dignity," emphasizing the vulnerability of very young refugees. They still do not feel safe: "The fear is deeply ingrained."

5.2 Perceived Lack of Close-Knit Social Networks in Germany

Another source of disconnection from the host country society presented in our interviews is a sense of alienation and loss regarding perceived differences in social life: "The social life I think here is very difficult, and I see this as the most difficult thing" (30–34M). Participants characterized their social networks in their countries of origin, to a great extent comprised of family, as being large ("I used to meet up to 150 family members per week", 30–34M), close-knit ("safe, held-together units," 25–29M), and involving frequent contact ("I spent most of my life, my whole time, in my friends' homes," 30–34F). By contrast, many participants expressed feelings of alienation about how they perceive Germans' social lives: distant, cold, or even non-existent. Difficulty making social connections with Germans, a fear of adapting to this lifestyle, and feelings of isolation were reported as concomitant with these observations. Participants across genders, age groups, and countries of origin expressed these thoughts:

"I thought Germany was a highly-developed country and everybody was happy. But I don't feel people are happy here, especially the Germans. I'm afraid to become like them. [...] German people lack a social life. [...] They don't visit each other." (Syrian, age 25–29).

"They are cold and take everything seriously, not like Eastern people who warm up quickly and make friends easily. [...] Even friendships are cold." (Afghan, age 18–24).

"I think this is a little bit scary [that she has not met neighbors of 2 years]; I feel like I am living alone." (Syrian, age 30–34).

A young woman (age 18–24) attending school spent the first year in Germany hiding from her classmates during recess and "sat at home and did nothing" but watch television series in her free time because she was doing "terribly" emotionally from feeling ignored and rejected by her peers at school. She said she came to attribute this to cultural differences. "[In my country of origin], if you catch someone's eyes on the street randomly, you say 'oh, hello!.' In Germany, I think if I just smiled at someone randomly and said 'hello,' this person would think 'piss off'."

A Sudanese participant (age 35–39) saw the loss of social "nearness" as a tradeoff for a society in which the state assumes responsibility for meeting many needs that, in Sudan, would be within the purview of relatives, friends, and religious figures: "People in Sudan live together, help one another, just do everything for one another. [This is something] I miss very, very much."

5.3 Lack of Social Support and Feelings of Community

These perceived differences in social life lead to a sense of loss of emotional support for some participants, affecting their mental well-being. One woman feels "exhausted" (30–34F) as a consequence of not being in the type of "social environment that gave [her] comfort." Another participant said that in the close-knit community in the country of origin, he "was not afraid of the future or anything" (25–29M). He described his current state in Germany, on the other hand, as being marked by depression, anxiety about building a life, and feeling alone with his problems. Another participant similarly feels that he is "not allowed to fall" in Germany because, unlike back home, no one will catch him: "I have to be so strict I cannot fail, and just thinking about it is very stressful" (25–29M).

Seeking long-distance social support from the familiar network is not always an option due to a reluctance to burden family and friends who are already perpetually worried. For example, a young man (25–29M) describes that he "would love to share that [he] feel[s] tired and stressed," with his family, but refrains so as not to worry them. When he is feeling particularly low, he avoids video calls or "put[s] on a mask."

5.4 Isolation in Refugee Camps

A few of our participants described the temporary residence in refugee mass accommodation after arrival in Germany as a period of social isolation in an already difficult time ["I always wonder if Germany is aware how depressive the people are that they are putting in mass accommodation" (25–29M)] with severe consequences for mental health and integration:

"The way they are isolating refugees in camps is totally destroying them. After all the suffering those refugees had to go through to reach Germany. [...] At the time they left the camps, they are already let down. I had friends who were so motivated when they first arrived in Germany. But they were isolated in camps for about 6 months until they got the residency. They were totally devastated by then. It took them a while to regain their mental health and be able to start again. But unfortunately, not all of them were capable of getting over it" (30–34F).

According to another participant (25–29M), the isolation in mass accommodation also means that although "there are many good organizations [promoting refugee social integration] [...]," it is difficult to become aware of these programs whilst living there: "I didn't see them for 2 years. [...] Events with others, with Germans, there weren't any. Or too few, and you have to find them yourself." Due to the psychological fatigue from flight and poor living conditions in mass accommodation, seeking out events is nearly impossible, according to this participant: "if you're in a camp, you have no motivation, zero motivation. [...]. The beginning is very difficult." He emphasized the importance of social connection in the initial phase of integration: "Maybe a word [from the host society] would help more than money and an apartment at the beginning," and argued that given the mental health risk of those in housing facilities, mental health care should be integrated or accessible on site: "I am surprised how there are no psychological support teams to work in the housing facilities [...] in an advanced country like in Germany [...], but with refugees, it seems like they don't care about our psychological issues."

Restrictions on visitors in some housing facilities and security measures also make several participants feel isolated: "we have to show our card like we are in jail" (30–34M).

5.5 Lack of Social Cohesion Within Refugee and Migrant Communities

Participants also experience rifts with co-nationals and fellow refugees in Germany for various reasons.

"There are also divisions between Farsi-speaking people. They do not stand by one another" (age 25–29).

"I have not interacted much with any Arabs. Unfortunately, with all due respect, there were some fights between the Arabs I met [here] and me. I could not cope with the Arabs" (age 30–34).

A few of our participants reported an inability to turn to people from their own community for connection and support because "most of them have their own troubles and prefer to be left alone" (30–34M) or because "they are not psychologically stable, always thinking [...], the Syrians in Germany are not like the ones in Syria" (age 25–29). Some have "deliberately moved away from [Arabic friends]" to escape the "negativity" and "discouragement" that apparently prevails in some Arabic refugee communities due to past and ongoing stressors: "In the camps for example, [...] they say negative things, there are obvious problems these people have experienced, so the conversations always turn into the negative" (age 30–34).

Within refugee housing facilities, stress-inducing conversations and gossip about the asylum process can be the cause of a psychologically damaging atmosphere: "[...] in the camp [...], people were talking about the trial and who got rejected or accepted! It was so stressful to witness all of this [...]" (45–49M). Additionally, refugees appear to experience highly dysfunctional social environments due to crowding in these large, temporary housing facilities: "We were in mass accommodation for a year and 6 months, meaning 70 people in a gym—the conditions were terrible. Police were there every day [...]. There were drugs, fights between residents, everything" (age 30–34).

Another potential threat to social cohesion, and thus, a threat to social support within refugee communities, appears to be mistrust and suspicion of others' intentions and grounds for seeking asylum, which often arises out of comparisons: "There are people I know very well who had no problems in [country of origin] and were nevertheless granted asylum. [...] They just stay at home and get social benefits, while [we] try with all our strength to achieve something [...] There has been confusion between those who deserve asylum and those who do not deserve it" (age 30–34). These statements often arise in the context of a participant reasoning that their efforts should be but are not rewarded with greater security than less engaged refugees receive: "The migrants who only eat and sleep, they could be treated differently" (18–24M). Frustration about the perceived lack of influence over one's fate may play into these perceptions.

Another participant (30–34M) who was "shocked" that their application for refugee status was rejected even considers some whose applications were accepted but "who don't deserve asylum" as a potential threat, as "dormant cells of the regime" who "carry news and reports about refugees living in Germany to the [country of origin] regime." This transfer of the suspicion bred by political persecution in the country of origin to German refugee communities was framed as an obstacle to engaging within these communities by another participant: "Until this moment, I still check around me every time I speak to see if anyone has heard or not. Sometimes when I attend a lecture about Syria, I get the feeling that someone is monitoring me" (age 18–24). Overall, these striking instances of mistrust and comparison, while not connected to mental health directly by our participants, may contribute to feelings of rejection and isolation.

Finally, several clashes arise within the refugee community as a result of behavioral adaptation processes that cause distress. An LGBT participant (age 30–34) who feels free to express their identity in Germany experiences distressing bullying in a refugee housing facility. Several of our female participants reported feeling stressed by clashes between their lifestyles in Germany and certain community members' values: "I [live] alone. I get a lot of criticism because of that from [my] community, [...] these criticisms put a lot of pressure on me" (18–24F). Some older participants reported feeling distressed by the lack of cultural cohesion amongst co-nationals in Germany. For example, one participant (50–55F) said that seeing young people from her country of origin "considering [themselves] German" and "not greeting her" in German class affects her ability to learn the language: "If I am not comfortable, I cannot learn."

These examples show that stress from pre- and post-migration adversities may have an indirect deleterious effect on mental health by eroding certain sources of social support. As a consequence of these multiple disconnections from Germans and co-nationals and fellow refugees alike, one participant feels left without a home: "I am distant from [both]. I have become very isolated" (25–29F).

DISCUSSION

Our study identified five themes capturing different links between mental health problems or significant negative emotional experiences and integration processes as prioritized by refugees recently resettled in Germany. The scope and content of our study provide a comprehensive overview, touching on all domains and facets of integration that were important to the participants. It is of note that all our themes were manifest among participants from different age groups, genders, cultural backgrounds, and from three different German urban areas.

Our first theme addresses how lasting distress from past adverse experiences as well as ongoing worries about those left behind in the homeland can seriously impede refugees' ability to pursue activities key to integration. Specifically, several participants expressed a sense of being hindered by a "head full of knots," a shortage of "brain capacity" or "being stuck," "unable to overcome the grief," "obsessed" with checking on those left behind and "unable to do" things like learning a new language or "unable to do anything" at all. While policy analyses have noted the potentially deleterious effects of mental health problems from adverse experiences on integration in their considerations [e.g., (57)] and some quantitative studies have found these correlations (29), our participants' reports add personal accounts of these effects. One participant's demand for psychotherapy as a prerequisite for integration shows that some refugees interpret their own situations as characterized by functional impairment hindering successful integration.

The second theme addresses how prolonged uncertainty in the asylum process and even afterward, when statuses are still limited to a few years at a time, has caused many of our participants substantial distress. They reported fear, anxiety, fatigue, and feelings of being at the mercy of a process they cannot influence—feelings of loss of control being a potential primary source of post-migration stress among refugees (58). These experiential reports add details to our understanding of the association between legal status insecurity and refugee mental well-being (16, 20, 24). Our participants also described that the burden of this uncertainty, like past adverse experiences, can lead to deactivation and that the threat of being sent away erodes motivation to participate and sense of belonging. It appears that legal status insecurity elicits feelings of being rejected or not valued by the host society and doubts about whether any steps forward in host society are worthwhile.

Our third theme includes accounts from participants who suffer from feeling stuck and thwarted in various ways in their attempts at "starting a new life," especially on the level of joining the labor market in a job appropriate to their background or taking preparatory steps like completing language courses. Unsurprisingly, those who had made substantial progress in their education or in their career before flight and are not close to the end of their careers were most anxious about finding meaningful and suitable activities. They reported experiencing "depression" because their efforts to advance their lives are perceived as fruitless. The loss of direction in life can be "tiring," and some participants have felt a burdensome lack of direction throughout their entire flight and post-flight life. Feelings of loss of agency and status and of not being valued also plague many of our participants.

The involuntary inactivity that follows from struggling to start life was described by participants as threatening to their mental health. They said it "kills" psychologically, brings on "unbearable meaninglessness" and feelings of no longer "being important" and "life just passing by," which mix with shame over receiving social benefits. Like male interviewees in a refugee camp study in Turkey (36), who reported feeling "bored and offended" because of not being able to work, some of our male participants feel forced into an unfamiliar and pride-eroding situation. In line with another German interview study, we found that the conditions in refugee housing facilities are often described as contributing to inactivity (37). These feelings of powerlessness, meaninglessness, lack of control over the future and passivity, as well as their mental health ramifications, have been described previously, for example, in a study titled "A Life in Waiting" (59) on refugees stuck in transit in Greece. It is striking that many of our participants, who have been living in a country they intend to stay in for at least several years, still feel stuck in waiting. Previous explorations of the role of active participation in fostering self-esteem, self-worth, a sense of purpose, and an alleviation of mental health problems among refugees [e.g., (60)] complement our findings in this theme.

The fourth theme presents the psychological toll of feeling overwhelmed by fundamental tasks in the integration process, namely, language learning and bureaucratic processes. Language learning struggles come with "psychological problems" like "pressure," "feelings of punishment," and "estrangement," especially for those with pre-existing mental health problems and those with limited educational backgrounds, a challenge that has been previously addressed (61, 62). While refugees' struggle with Germany's bureaucracy has been reported elsewhere (63), the psychological toll of bureaucratic hurdles on refugees appears to be rarely discussed in the literature. However, another German interview study also found that the lack of knowledge about processes and unpredictable or unclear administrative demands result in helplessness and loss of self-esteem (37). Overall, female participants expressed a sense of feeling overwhelmed more often than male participants, whose stress about bureaucratic processes tended to manifest in anger about perceived mistreatment and restrictions.

Finally, in the fifth theme, we identified several forms of social disconnection that were linked to mental distress by our participants explicitly or interpreted by us as threatening to well-being under the assumption that social support and social embeddedness are crucial to it (64). Experiences of xenophobia and racism were reported by most participants, consistent with previous findings (65). The link between experiences of xenophobia and racism and refugee mental health has been previously evidenced in the literature [e.g., (26, 66)]. While many of our participants only felt somewhat impacted, others reported strong feelings of rejection and not belonging, loss of dignity, sometimes fear, and the urge to withdraw socially and give up on integration. Our interviewees were also aware of and distressed by the rise of anti-immigrant sentiments in Germany and described feeling instrumentalized in political debates in a way that harms their relationship to host society communities.

Beyond rejection, our participants described experiencing a clash between Germany's forms of togetherness, which they see as "cold," "distant," or even absent, and the close-knit communities they come from. Some participants reflected on this as the clash between collectivist and individualist cultures (67). Several reported a lack of social support in the absence of their familiar social environment and feelings of pressure or exhaustion from living without their social safety net. While the impact of missing social support on refugee mental health has been discussed [e.g., (12)], our results suggest that it would be interesting to explore further whether there are certain forms of social support, not just social support *per se*, that are missing. In the early stages after arrival, complete isolation from the outside world in reception centers is a major threat to well-being, as others have reported [e.g., (37)]. Our participants offered striking warnings about the potential long-term harms of isolation and restrictive, stressful, even "inhumane" living environments at a time of severe vulnerability.

Our participants also reported rifts with fellow refugees and other co-nationals living in Germany. These represent threats to integration when integration is seen as consisting of both bridges between migrant and non-migrant communities and bonds within migrant communities (56). These conflicts appear to stem in part from flight and migration-related mental health problems, presenting another instance of mental health influencing integration. Our participants reported pervasive negativity among refugee communities because members of the community are "not psychologically stable." Pervasive stress and talk about legal status matters, including unfavorable comparisons with those "who don't deserve asylum," further damage social cohesion. While migration's effects on social cohesion, in general, have been discussed in the literature [e.g., (68)], social cohesion within refugee communities has rarely been addressed. One existing study on refugee activism found that legal status hierarchies cause rifts in refugee movements (69). Some individuals also experience stress within their community due to how they break with expectations in their new environment, a form of acculturation stress described in the migration literature (70). We argue that these erosions of solidarity pose a threat to mental health as well.

In reflecting on our results, it becomes clear that there is ample potential for interconnections between the mechanisms described within different themes. One form of connection between the themes emerges from the bidirectionality of effects. If mental health problems and feelings of uncertainty, rejection, or frustration can impede integration, and reduced progress with integration can cause or exacerbate mental health problems, then the potential for vicious cycles is evident. Secondly, the dynamics described in our themes could multiply one another because of the close connection between domains of integration, for example, between labor market integration, social networks, and language (71).

Implications for Concepts and Policymaking

Our study supports Ager and Strang's (2) understanding of health as a "means and marker" of integration in the sense that it is both "an important resource for active engagement in a new society" and an outcome of successful integration policy. However, Ager and Strang limit their understanding of health as an outcome of successful integration policy to a demand for adequate healthcare as a part of integration measures. Our analysis supports health as an indicator of successful integration in a much broader sense: various domains of integration and their interplay have the potential to strengthen or erode refugee mental health and well-being. The close relationship between living conditions and mental health is not unique to refugees, and neither is the resulting public health imperative of providing living circumstances that foster mental health [e.g., (72–74)]. The WHO's "Health in All Policies" approach (75) encapsulates this demand. However, as others have previously argued, "Health in All Policies" is particularly relevant in the migrant and refugee context (8, 76). In a population that faces uniquely severe threats to well-being, "mental health" should not be conceived and treated in the medicalizing, individualizing sense, but as a direct distress response to adverse circumstances (77, 78). The term "refugee mental health" thus represents mental health as inextricably linked to the circumstances faced by this population pre-, peri-, and post-migration (79), both as a direct outcome of adequate conditions and as an important resource for integration.

It thus follows that integration policy is also health policy and vice versa. In Germany, refugee mental health care could be improved by ensuring immediate full access (80), more screenings and checkpoints in, e.g., refugee housing facilities and Job Centers, as suggested by one of our participants, and the development of lower threshold psychosocial interventions and community-based approaches as a way of meeting demand and connecting mental health needs to broader needs (81–83).

On the integration policy side, our study demonstrates the need for quick but high-quality, reliable asylum procedures (44) and the need to reconsider whether the legal status hierarchy is justifiable given its deleterious impacts (84). Ensuring immediate complete access to institutions and opportunities such as permission to stay for full vocational training to all new arrivals could be beneficial in myriad ways (57), if not for long-term integration, then for the sake of international development (84). The introduction of professional mentoring programs, such as those under development in Austria, Norway, and Switzerland (57), and easing access to the labor market by replacing certificates with skills tests and opportunities to learn on the job (85) could promote participation. Housing conditions need to be compatible with an active life (85). The diversification of integration routes is also important: for example, the diversification of language courses according to background and goals (57). Furthermore, a streamlining, shortening and simplification of laws and processes is needed (85), both to benefit refugees lost in a bureaucratic jungle and for organizations working with them (84). Finally, the facilitation of community projects that are easy to access has the potential to address multiple obstacles that our participants describe and simultaneously foster social connection and cohesion (81, 86).

Limitations

Potential selection biases in participant recruitment represent an important limitation in our study. While we achieved our goal of recruiting some participants who are hard to reach, such as older and illiterate refugees, there are still undoubtedly self-selectivity mechanisms involved. Very highly educated participants were clearly more likely to self-select into our sample, as the high proportion of university-educated interviewees shows. All participants were able to follow through with an interview appointment, and they were willing to open up. They might have been particularly keen to voice their perceptions of what is not working in their integration efforts. Our a priori focus on challenges and problems in the present study may also have skewed the overall impression of refugees' experiences to the negative—a further limitation. A sister study on resilience based on the same data offers another perspective (49).

Furthermore, it was not the aim of this study to diagnose mental health problems. Thus, the instances of poor mental health identified cover a broad range. It is a strength of our research that we were able to offer participants interviews in their preferred language and with culturally competent interviewers. However, despite a quality check, translated transcripts may not be linguistically precise and do not reflect subtleties in tone. The necessity for multiple interviewers also added complexity to the study and may have introduced some systematic differences between interviews. The different cultural backgrounds of researchers, participants, and interviewers may, of course, also have resulted in some misunderstandings, particularly with regard to questions and concepts relating to mental health. This study did not capture the experiences of refugees living in rural settings in Germany.

CONCLUSION

This study examines the complex and intertwined relationship between mental health and integration for a diverse sample of recently-arrived refugee adults in three different urban areas in Germany. Our findings shed light on various ways in which, on the one hand, poor mental health negatively impacts the ability to pursue integration, and, on the other hand, difficulties integrating within different domains contribute to mental health problems. This study has policy implications for stakeholders interested in integrating refugee populations across Germany, including the need to ensure mental health service provision, improve the speed and quality of the asylum-seeking process and reevaluate the legal status hierarchy, provide integration and language courses that are sensitive to individual differences, including mental health status, reduce bureaucratic demands, improve housing conditions, increase awareness regarding the impact of discrimination from the host community on the integration of incoming populations, and support initiatives that combat isolation and disconnection. Innovative solutions to challenges identified by members of the refugee community in Germany stand to benefit mental health and integration outcomes simultaneously.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the data consists of complete semi-structured interviews that reveal a lot of personal information, so we would not be able to safeguard the anonymity of our participants by sharing the data, even if no explicit identifications were included. Requests to access the datasets should be directed to lena.walther@charite.de.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Commission of the Charité–Universitätsmedizin Berlin. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

LW, TT, EH, and MB conceived of the study. LW developed the mental health part of topic guide. LW, DR, JA, and further collaborators collected the data. LW and JA coded the transcripts. LW performed the thematic analysis with feedback and input from JA. LW wrote the manuscript. DR gave feedback and input on multiple drafts of the manuscript. UF, TT, EH, and MB critically reviewed and made edits to the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by the German Federal Ministry of Education and Research (grant number 01UM1812BY). DR was supported by the U.S. Fulbright Scholar Program. We also acknowledge support from the German Research Foundation (DFG) and the Open Access Publication Funds of Charité - Universitätsmedizin Berlin.

ACKNOWLEDGMENTS

We would like to thank Carine Karnouk, Zaher Alkaie, Alireza Ghandchi, and Karam Yahya for their valuable insights in our discussions of the themes.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2021.576481/full#supplementary-material

REFERENCES

1. Castles S, Korac M, Vasta E, Vertovec S. Integration: mapping the field. *Home Office Online Report.* (2002) 29:115–8.
2. Ager A, Strang A. Understanding integration: a conceptual framework. *J Refug Stud.* (2008) 21:166–91. doi: 10.1093/jrs/fen016
3. Maehler D, Brinkmann HU. *Methoden der Migrationsforschung: Ein Interdisziplinärer Forschungsleitfaden*. Wiesbaden: Springer VS (2015). doi: 10.1007/978-3-658-10394-1
4. Penninx R, Garcés-Mascareñas B. The concept of integration as an analytical tool and as a policy concept. In: Garcés-Mascareñas B, Penninx R, editors. *Integration Processes and Policies in Europe.* Cham: Springer (2016). p. 11–29. doi: 10.1007/978-3-319-21674-4_2
5. Diehl C, Lubbers M, Mühlau P, Platt L. Starting out: new migrants' socio-cultural integration trajectories in four European destinations. *Ethnicities.* (2016) 16:157–79. doi: 10.1177/1468796815616158
6. Ager A, Strang A. The Experience of Integration: a qualitative study of refugee integration in the local communities of Pollockshaws and Islington. In: *Research Development and Statistics Directorate, Home Office Online Report* (2004).
7. Desiderio MV. *Integrating Refugees Into Host Country Labor Markets: Challenges and Policy Options*. Washington, DC: Migration Policy Institute (2016).
8. Ingleby D. *European Research on Migration and Health, Background Paper Developed Within the Framework of the IOM Project "Assisting Migrants and Communities (AMAC): Analysis of Social Determinants of Health and Health Inequalities.* Geneva: International Organization for Migration (2009).
9. Fazel M, Wheeler J, Danesh J. Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *Lancet.* (2005) 365:1309–14. doi: 10.1016/S0140-6736(05)61027-6
10. Porter M, Haslam N. Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: a meta-analysis. *JAMA.* (2005) 294:602–12. doi: 10.1001/jama.294.5.602
11. Steel Z, Chey T, Silove D, Marnane C, Bryant RA, van Ommeren M. Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *JAMA.* (2009) 302:537–49. doi: 10.1001/jama.2009.1132
12. Bogic M, Njoku A, Priebe S. Long-term mental health of war-refugees: a systematic literature review. *BMC Int Health Hum Rights.* (2015) 15:1–41. doi: 10.1186/s12914-015-0064-9
13. Morina N, Akhtar A, Barth J, Schnyder U. Psychiatric disorders in refugees and internally displaced persons after forced displacement: a systematic review. *Front Psychiatry.* (2018) 9:433. doi: 10.3389/fpsyt.2018.00433
14. Turrini G, Purgato M, Ballette F, Nosè M, Ostuzzi G, Barbui C. Common mental disorders in asylum seekers and refugees: umbrella review of prevalence and intervention studies. *Int J Ment Health Syst.* (2017) 11:1–14. doi: 10.1186/s13033-017-0156-0
15. Lindert J, Wehrwein A, Brähler E, Brähler E, Schäfer I. Anxiety, depression and post-traumatic stress disorder in refugees-a systematic review. *Psychother Psychosom Med Psychol.* (2018) 68:22–9. doi: 10.1055/s-0043-103344
16. Walther L, Kröger H, Tibubos AN, Ta TM, von Scheve C, Schupp J, et al. Psychological distress among refugees in Germany: a cross-sectional analysis of individual and contextual risk factors and potential consequences for integration using a nationally representative survey. *BMJ Open.* (2020) 10:e033658. doi: 10.1136/bmjopen-2019-033658
17. Johnson H, Thompson A. The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: a review. *Clin Psych Rev.* (2008) 28:36–47. doi: 10.1016/j.cpr.2007.01.017
18. Lindert J, Carta MG, Schäfer I, Mollica RF. Refugees mental health - A public mental health challenge. *Eur J Pub Health.* (2016) 26:374–5. doi: 10.1093/eurpub/ckw010
19. Hynie M. The social determinants of refugee mental health in the post-migration context: a critical review. *Can J Psychiatry.* (2018) 63:297–303. doi: 10.1177/0706743717746666
20. Laban CJ, Gernaat HB, Komproe IH, Schreuders BA, De Jong JT. Impact of a long asylum procedure on the prevalence of psychiatric disorders in Iraqi asylum seekers in The Netherlands. *J Nerv Ment Dis*. (2004) 192:843–51. doi: 10.1097/01.nmd.0000146739.26187.15
21. Steel Z, Momartin S, Bateman C, Hafshejani A, Silove DM, Everson N, et al. Psychiatric status of asylum seeker families held for a protracted period in a remote detention centre in Australia. *Austral NZ J Public Health*. (2004) 28:527–53. doi: 10.1111/j.1467-842X.2004.tb00042.x
22. Löbel LM. Family separation and refugee mental health-A network perspective. *Soc Netw*. (2019) 4:20–33. doi: 10.1016/j.socnet.2019.08.004
23. Leiler A, Bjärtå A, Ekdahl J, Wasteson E. Mental health and quality of life among asylum seekers and refugees living in refugee housing facilities in Sweden. *Soc Psychiatry Psychiatric Epidemiol.* (2019) 54:543–51. doi: 10.1007/s00127-018-1651-6
24. Walther L, Fuchs LM, Schupp J, von Scheve C. Living conditions and the mental health and well-being of refugees: evidence from a large-scale german survey. *J Immig Minor Health.* (2020) 22:903–13. doi: 10.1007/s10903-019-00968-5
25. Kartal D, Alkemade N, Kiropoulos L. Trauma and mental health in resettled refugees: mediating effect of host language acquisition on post-traumatic stress disorder, depressive and anxiety symptoms. *Transcult Psychiatry*. (2019) 56:3–23. doi: 10.1177/1363461518789538
26. Ziersch A, Due C, Walsh M. Discrimination: a health hazard for people from refugee and asylum-seeking backgrounds resettled in Australia. *BMC Pub Health.* (2020) 20:1–14. doi: 10.1186/s12889-019-8068-3
27. Bakker L, Dagevos J, Engbersen G. The importance of resources and security in the socio-economic integration of refugees. A study on the impact of length of stay in asylum accommodation and residence status on socio-economic integration for the four largest refugee groups in the Netherlands. *J Int Migr Integr.* (2014) 15:431–48. doi: 10.1007/s12134-013-0296-2
28. Beiser M, Goodwill AM, Albanese P, McShane K, Kanthasamy P. Predictors of the integration of Sri Lankan Tamil refugees in Canada: pre-migration adversity, mental health, personal attributes, and post-migration experience. *Int J Migr Health Soc Care.* (2015) 11:29–44. doi: 10.1108/IJMHSC-02-2014-0008
29. Schick M, Zumwald A, Knöpfli B, Nickerson A, Bryant RA, Schnyder U, et al. Challenging future, challenging past: the relationship of social integration and psychological impairment in traumatized refugees. *Eur J Psychotraumatol.* (2016) 7:28057. doi: 10.3402/ejpt.v7.28057
30. Hoare T, Vidgen A, Roberts N. In their own words: a synthesis of the qualitative research on the experiences of adults seeking asylum. A systematic review of qualitative findings in forced migration. *Med Confl Surviv.* (2017) 33:273–98. doi: 10.1080/13623699.2017.1419902
31. Rowley L, Morant N, Katona C. Refugees who have experienced extreme cruelty: a qualitative study of mental health and wellbeing after being granted leave to remain in the UK. *J Immigr Refug Stud.* (2020) 18:357–74. doi: 10.1080/15562948.2019.1677974
32. Ahearn FL. Psychosocial wellness: methodological approaches to the study of refugees. In: Ahearn FL, editor. *Psychosocial Wellness of Refugees: Issues in Qualitative and Quantitative Research. Studies in Forced Migration*. Vol. 7. New York, NY: Berghahn Books (2000). p. 3–23.

33. Flick U. *An Introduction to Qualitative Research: Theory, Method and Applications*. Thousand Oaks, CA: Sage (1998).
34. Ziersch A, Walsh M, Due C, Duivesteyn E. Exploring the relationship between housing and health for refugees and asylum seekers in South Australia: a qualitative study. *Int J Environ Res Public Health*. (2017) 14:1036. doi: 10.3390/ijerph14091036
35. Strang AB, Quinn N. *Integration or Isolation?: Mapping Social Connections and Well-Being Amongst Refugees in Glasgow*. Glasgow: NHS Greater Glasgow and Clyde (2014).
36. Cantekin D. Syrian refugees living on the edge: policy and practice implications for mental health and psychosocial well-being. *Int Migr*. (2019) 57:200–20. doi: 10.1111/imig.12508
37. Gürer C. Refugee perspectives on integration in Germany. *Am J Qual Res*. (2019) 3:52–70. doi: 10.29333/ajqr/6433
38. Mangrio E, Zdravkovic S, Carlson E. Refugee women's experience of the resettlement process: a qualitative study. *BMC Women's Health*. (2019) 19:147. doi: 10.1186/s12905-019-0843-x
39. UNHCR (2019). *Global Trends 2018 - Forced Displacement*. Available online at: https://www.unhcr.org/5d08d7ee7.pdf
40. Brücker H, Rother N, Schupp J. *IAB-BAMF-SOEP-Befragung von Geflüchteten: Überblick und erste Ergebnisse*. DIW Berlin: Politikberatung kompakt (2016).
41. Bundesministerium des Inneren (BMI). *890.000 Asylsuchende im Jahr 2015. Pressemitteilung vom 30.9.2016*. Berlin: BMI (2016).
42. Andritzky J, Aretz B, Christofzik DI, Schmidt CM. Influx of refugees: integration as a key challenge. In: *German Council of Economic Experts Arbeitspapier No.* (Wiesbaden) (2016).
43. Laubenthal B. Refugees welcome? Reforms of German asylum policies between 2013 and 2017 and germany's transformation into an immigration country. *Ger Polit*. (2019) 28:412–25. doi: 10.1080/09644008.2018.1561872
44. Hänsel V, Hess S, Schurade S. Refugee protection regimes: Germany country report. In: *Respond Working Papers: Global Migration: Consequences and Responses*. Göttingen: Respond (2019). p. 28.
45. Schmid V, Kück S. Access to housing in Germany. In: Korntheuer A, Pritchard P, Maehler DB editors. *Structural context of refugee integration in Canada and Germany*. Köln: GESIS Leibniz Institute for Social Sciences (2017). p. 73–80.
46. Rietig V. *Moving Beyond Crisis: Germany's New Approaches to Integrating Refugees Into the Labor Market*. Washington, DC: Migration Policy Institute (2016).
47. Prem M. Access to resettlement services in Germany. In: Korntheuer A, Pritchard P, Maehler DB, editors. *Structural Context of Refugee Integration in Canada and Germany*. Köln: GESIS Leibniz Institute for Social Sciences (2017). p. 119–126.
48. King N, Horrocks C, Brooks J. *Interviews in Qualitative Research*. SAGE Publications Limited (2018).
49. Walther L, Amann J, Flick U, Ta TM, Bajbouj M, Hahn E. A qualitative study on resilience in adult refugees in Germany. *BMC Public Health*. (2021) 21:1–7. doi: 10.1186/s12889-021-10817-6
50. Adams W. Conducting semi-structured interviews. In: Newcomer KE, Hatry HP, Wholey JS. editors. *Handbook of Practical Program Evaluation*. John Wiley and Sons (2015). p. 492–505. doi: 10.1002/9781119171386.ch19
51. Kallio H, Pietilä AM, Johnson M, Kangasniemi M. Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *J Adv Nurs*. (2016) 72:2954–65. doi: 10.1111/jan.13031
52. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. (2006) 3:77–101. doi: 10.1191/1478088706qp063oa
53. Ayres L, Kavanaugh K, Knafl K. A within-case and across-case approaches to qualitative data analysis. *Qual Health Res*. (2003) 13:871–83. doi: 10.1177/1049732303013006008
54. Patel V, Saxena S, Lund C, Thornicroft G, Baingana F, Bolton P, et al. The lancet commission on global mental health and sustainable development. *Lancet*. (2018) 392:10157. doi: 10.1016/S0140-6736(18)31612-X
55. Esser H. Strukturelle assimilation und ethnische schichtung. In: Ittel A, Merkens H, editors. *Interdisziplinäre Jugendforschung*. VS Verlag für Sozialwissenschaften (2006). p. 89–104. doi: 10.1007/978-3-531-90278-4_5
56. Putnam RD. *Bowling Alone: The Collapse and Revival of American Community*. New York, NY: Simon and Schuster, Inc. (2000). doi: 10.1145/358916.361990
57. Degler E, Liebig T, Senner AS. *Integrating Refugees into the Labour Market-Where Does Germany Stand*? ifo Instiute - Leibniz Institute for Economic Research at the University of Munich (2017). p. 6–10.
58. Miller KE, Rasmussen A. The mental health of civilians displaced by armed conflict: an ecological model of refugee distress. *Epidemiol Psychiatr Sci*. (2017) 26:129–38. doi: 10.1017/S2045796016000172
59. Bjertrup PJ, Bouhenia M, Mayaud P, Perrin C, Farhat JB, Blanchet K. A life in waiting: refugees' mental health and narratives of social suffering after European Union border closures in March 2016. *Soc Sci Med*. (2018) 215:53–60. doi: 10.1016/j.socscimed.2018.08.040
60. Wood N, Charlwood G, Zecchin C, Hansen V, Douglas M, Pit SW. Qualitative exploration of the impact of employment and volunteering upon the health and well-being of African refugees settled in regional Australia: a refugee perspective. *BMC Public Health*. (2019) 19:1–15. doi: 10.1186/s12889-018-6328-2
61. Elmeroth E. From refugee camp to solitary confinement: illiterate adults learn Swedish as a second language. *Scand J Educ Res*. (2003) 47:431–49. doi: 10.1080/00313830308593
62. Li G, Sah PK. Immigrant and refugee language policies, programs, and practices in an era of change: promises, contradictions, and possibilities. In: Gold SJ, Nawyn SJ, editors *International Handbook of Migration Studies Routledge*. (2019). p. 325–38. doi: 10.4324/9781315458298-33
63. Pearlman W. Culture or bureaucracy? Challenges in Syrian refugees' initial settlement in Germany. *Middle East Law Govern*. (2017) 9:313–27. doi: 10.1163/18763375-00903002
64. Gottlieb BH. *Social Networks and Social Support*. Beverly Hills, CA: Sage Publications (1981).
65. Risks of discrimination for refugees in Germany and situation analysis. *German Federal Anti-Discrimination Agency*. Available online at: http://www.antidiskriminierungsstelle.de/SharedDocs/Downloads/DE/publikationen/Expertisen/Diskriminierungsrisiken_fuer_Gefluechtete_in_Deutschland.pdf
66. Haase A, Rohmann A, Hallmann K. An ecological approach to psychological adjustment: a field survey among refugees in Germany. *Int J Intercult Relat*. (2019) 68:44–54. doi: 10.1016/j.ijintrel.2018.10.003
67. Hofstede G, Hofstede GJ, Minkov M. *Cultures and Organizations: Software of the Mind. Revised and Expanded*. 3rd Edn. New York, NY: McGraw-Hill (2010).
68. Daley C. Exploring community connections: community cohesion and refugee integration at a local level. *Commun Dev J*. (2009) 44:158–71. doi: 10.1093/cdj/bsm026
69. Odugbesan A, Schwiertz H. We are here to stay-refugee struggles in germany between unity and division. In: Rosenberger S, Stern V, Merhaut N, editors. *Protest Movements in Asylum and Deportation*. Cham: Springer (2018). p. 185–203. doi: 10.1007/978-3-319-74696-8_9
70. Habib N. Gender role changes and their impacts on Syrian women refugees in Berlin in light of the Syrian crisis. in: *Discussion Papers, Research Unit: Migration, Integration, Transnationalization*. WZB Berlin Social Science Centre (2018).
71. Landesmann M, Leitner SM. *Various Domains of Integration of Refugees and Their Interrelationships: A Study of Recent Refugee Inflows in Austria*. Vienna: Vienna Institute for International Economic Studies (2019). p. 168.
72. Saraceno B. Mental health: scarce resources need new paradigms. *World Psychiatry*. (2004) 3:3–5.
73. Silva M, Loureiro A, Cardoso G. Social determinants of mental health: a review of the evidence. *Eur J Psychiat*. (2016) 30:259–92.
74. World Health Organization. *Regional Office for Europe. Mental Health Promotion and Mental Health Care in Refugees and Migrants: Technical Guidance*. (2018). Available online at: https://apps.who.int/iris/bitstream/handle/10665/342277/9789289053747-eng.pdf?sequence=1
75. World Health Organization (WHO). *The Helsinki statement on Health in All Policies. Health Promot Int 29:S1*. World Health Organization (2014). doi: 10.1093/heapro/dau036
76. Juárez SP, Honkaniemi H, Dunlavy AC, Aldridge RW, Barreto ML, Katikireddi SV, et al. Effects of non-health-targeted policies on migrant health: a systematic review and meta-analysis. *Lancet Glob Health*. (2019) 7:e420–35. doi: 10.1016/S2214-109X(18)30560-6

77. Watters C. Emerging paradigms in the mental health care of refugees. *Soc Sci Med*. (2001) 52:1709–18. doi: 10.1016/S0277-9536(00)00284-7
78. Marlowe JM. Conceptualising refugee resettlement in contested landscapes. *Austral Rev Afr Stud*. (2009) 30:128–51.
79. Zipfel S, Pfaltz MC, Schnyder U. Editorial: Refugee Mental Health. *Front Psychiatry*. (2019) 10:72. doi: 10.3389/fpsyt.2019.00072
80. Chiarenza A, Dauvrin M, Chiesa V, Baatout S, Verrept H. Supporting access to healthcare for refugees and migrants in European countries under particular migratory pressure. *BMC Health Serv Res*. (2019) 19:513. doi: 10.1186/s12913-019-4353-1
81. Miller KE. Rethinking a familiar model: psychotherapy and the mental health of refugees. *J Contemp Psychother*. (1999) 29:283–306. doi: 10.1023/A:1022926721458
82. Silove D, Ventevogel P, Rees S. The contemporary refugee crisis: an overview of mental health challenges. *World Psychiatry*. (2017) 16:130–9. doi: 10.1002/wps.20438
83. Böge K, Karnouk C, Hahn E, Schneider F, Habel U, Banaschewski T, et al. Mental health in refugees and asylum seekers (MEHIRA): study design and methodology of a prospective multicentre randomized controlled trail investigating the effects of a stepped and collabourative care model. *Eur Arch Psy Clin N*. (2019) 270:95–106. doi: 10.1007/s00406-019-00991-5
84. Kiziak T, Sixtus S, Klingholz R. *Von individuellen und institutionellen Hürden: Der lange Weg zur Arbeitsmarktintegration von Geflüchteten*. Berlin: Berlin-Institut für Bevölkerung und Entwicklung Discussion Paper (2019). p. 23.
85. Ekren E. Obstacles to refugees' self-reliance in Germany. *Forced Migr Rev*. (2018) 58:30–2.
86. Mahoney D, Siyambalapitiya S. Community-based interventions for building social inclusion of refugees and asylum seekers in Australia: a systematic review. *J Soc Incl*. (2017) 8:66–80. doi: 10.36251/josi.125

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 handling editor declared a shared affiliation with the authors at time of review.

frontiers in Public Health

ORIGINAL RESEARCH
published: 02 December 2021
doi: 10.3389/fpubh.2021.647543

Doctors Dealing With COVID-19 in Pakistan: Experiences, Perceptions, Fear, and Responsibility

Inayat Ali[1]**, *Salma Sadique*[2] *and Shahbaz Ali*[3]

[1] Department of Social and Cultural Anthropology, University of Vienna, Vienna, Austria, [2] Community Health Sciences, Peoples University of Medical and Health Science Women, Nawabshah, Pakistan, [3] Sindh Institute of Ophthalmology and Visual Sciences (SIOVS), Hyderabad, Pakistan

This study aimed to describe the dealings of 20 biomedical doctors with coronavirus disease-19 (COVID-19) in the Sindh province of Pakistan. Focusing on physicians from three different hospitals, we describe their challenges, emotions, and views concerning the pandemic. Many regarded the virus from a biomedical standpoint. Yet some also perceived it as a "tool of a proxy war" and a "plot," without giving agency to anyone for that "plot." Furthermore, these care providers faced a great fear of infection and an even greater fear of transmitting the virus to their families and friends. A few also feared stigmatization as viral carriers. Whether they experienced fear or not, all of our physician interlocutors emphasized their sense of responsibility to "serve humanity," yet some also expressed a strong belief in the inevitability of the will of Allah. Some were satisfied with the role of the government in containing the virus, while others expressed concerns and felt that the government should be doing much more. All expressed confidence in the use of personal protective equipment (PPE), viewing it as an effective buffer against viral contagion. We conclude with a call for further research especially ethnographic studies on dealings of physicians with COVID-19 across Pakistan as frontline care providers.

Keywords: COVID-19, pandemic, healthcare providers, anxiety, fear, Sindh, Pakistan, coping mechanism

OPEN ACCESS

Edited by:
Malek Bajbouj,
Charité – Universitätsmedizin Berlin, Germany

Reviewed by:
Fawad Rasool,
Bahauddin Zakariya University, Pakistan
Qaisar Khalid Mahmood,
International Islamic University, Islamabad, Pakistan

***Correspondence:**
Inayat Ali
inayat_qau@yahoo.com

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Public Health

Received: *25 January 2021*
Accepted: *27 August 2021*
Published: *02 December 2021*

Citation:
Ali I, Sadique S and Ali S (2021) Doctors Dealing With COVID-19 in Pakistan: Experiences, Perceptions, Fear, and Responsibility. Front. Public Health 9:647543. doi: 10.3389/fpubh.2021.647543

INTRODUCTION

Amid a pandemic, frontline healthcare providers play pivotal roles and face critical impacts—social, psychological, and economic. Past pandemics have revealed such impacts, as healthcare providers dealing with people infected by severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) were under extraordinary stress related to high risk of infection, stigmatization, understaffing, and uncertainty; consequently, comprehensive support for such providers was a high priority during these outbreaks and afterward (1–3). The primary sources of stress for providers have been shown to be fear of infection and of transmitting the disease to their families (2–4).

Current studies from across the world have pointed out severe impacts of the coronavirus pandemic—e.g., anxiety, trauma, and depressive symptoms—on healthcare providers, owing to increasing clinical responsibility, more chances to be infected, and possible family viral transmission (5–20). They have excessively experienced unpleasant emotions: fear, sadness, pain, uncertainty, and danger, along with intrusive memories, hyperarousal, and insomnia (20). This has happened due to multiple reasons such as extraordinary duties, overwhelmed resources, lack of thorough knowledge about the new virus, underdeveloped and frequently changing protocols, fear of auto-infection, and the risk of spreading the virus to their families and friends.

When we wrote this study in December 2020, there were a few studies, even from a public health perspective, on the impacts of the pandemic on Pakistani healthcare workers (HCWs). Now, while revising this study in August 2021, we have found that there are several recent studies conducted from that perspective; we present some of them here to help us make our points. Some studies have explored these impacts on healthcare providers in Pakistan, specifically. For instance, Sandesh et al. (21) found high levels of anxiety, stress, and depression among Pakistani healthcare providers related to coronavirus disease-19 (COVID-19). Khattak et al. (22) explored the psychological impacts that the fear of COVID-19 has exerted on nurses in the country. Similarly, Munawar and Choudhry (23) illustrated the stress experienced and coping mechanisms utilized by frontline emergency healthcare providers who have minimized their media exposure to avoid reading, hearing, and watching the news about COVID-19; many rely on religion to mitigate these challenging effects. Rana et al. (24) also indicated how healthcare providers have remained under physical and psychological pressure caused by fears of a high risk of infection, inadequate equipment for safety from contagion, isolation, exhaustion, and lack of contact with their families. Considering the importance of the Primary Health Providers' (PHPs) views, Hussain et al. studied the knowledge, attitudes, and practices toward COVID-19 in three tertiary care hospitals located in Peshawar, Khyber, Pakhtunkhwa (KPK) (25). While paying attention to the determinants of anxiety in physicians who worked in coronavirus wards or quarantine centers, Mahmood et al. found that there are substantial associations between "gender and anxiety" and identified specific needs of physicians, such as in relation to personal protective equipment (PPE), quarantine management, security and public support, and resource allocation (26). Moreover, Arshad et al. aimed to explore depression, anxiety, and stress (DAS) in HCWs and found that depression was significantly associated with the profession, and anxiety and stress were substantially associated with the age of HCWs: older ones wore more anxious and younger ones less (27).

Nonetheless, anthropological perspectives on healthcare providers to show the impacts of COVID-19, especially from the Sindh province of Pakistan, are still scarce. Therefore, this study aimed to explore and analyze the impacts of COVID-19 on biomedical doctors in Sindh and the coping mechanisms that they have adopted during the pandemic for dealing with people infected by this virus and with their own anxieties and fears.

METHODS AND MATERIALS

Research Design, Participants, and Sampling

This study builds on ethnographic observations and fieldwork conducted during the COVID-19 pandemic, which was initially reported in Pakistan in February 2020. Employing qualitative research methods, we recruited biomedical doctors who were treating the patients suffering from COVID-19. These physicians worked in three COVID-19-designated hospitals in Sindh province: (1) Civil Hospital, (2) Peoples Hospital, and Taluqa [sub-district] Headquarter (THQ) Hospital. They participated in hour-long semi-structured in-depth interviews during August–September 2020. The convenience or purposive sample included 20 interlocutors serving in the frontline COVID-19 teams at these three hospitals. These physicians were approached by author Salma Sadique, who had access to them because she is working in a medical university.

Data Collection

Using an interview guide, we focused our interviews with doctors on our key questions for them: (1) knowledge and perceptions around COVID-19; (2) social and psychological effects; (3) opinions about the dealings of the government with the pandemic; and (4) opinions about the end of the pandemic. Moreover, we carried out content and document analysis of gray literature, such as news reports and various surveys, mainly government reports, to contextualize the pandemic in Pakistan as background for understanding our interview results. Whenever possible, social scientists, mainly anthropologists, obtain their data in the native language due to several important factors, such as ethical considerations, valuing the local language, and collecting accurate data. Thus, all interviews were conducted in the Sindhi language, as this language was the mother tongue of these doctors. Salma Sadique conducted 18 interviews face-to-face and 2 *via* telephone. The composition of interlocutors included men, women, Muslims, Hindus, young adults, and elder adults (see **Table 1**). All interlocutors were informed about the project and asked to give their consent. Although the data generated from these 20 interviews cannot be generalized across the province, these proved enough for this study, as we reached saturation in terms of themes and information provided. We drew on Sandelowski's concept of "informational redundancy": that when a researcher listens to similar views time and again, she/he reaches data saturation (28). The same stands true in our context; when, during the interviews, Sadique heard the same comments repetitively, she realized that no new data were emerging, only redundancies. Thus, she stopped data collection. Thereafter, we started analyzing the already collected data. Moreover, in ethnographic research, the sample size may be small, but the data collected are in-depth (29). Similarly, our research is anthropological and, thus, qualitative in nature. Instead of quantification, it aimed to arrive at an in-depth understanding of the physicians interviewed and the COVID-related problems they faced. Without claiming that the results are representative of the entire population of the province, we can say that our research does provide insight into the perceptions of interlocutors of COVID-19 and the impacts of the pandemic as they experienced them.

Herein, we also draw on our extensive previous ethnographic fieldwork in Pakistan, specifically in Sindh province—Inayat Ali (2005-present), Salma Sadique (2013-present), and Shahbaz Ali (2012-present)—in which we have focused on health and illness. It is important to mention that this study is part of a long project on COVID-19 that has been approved by Pakistan's National Bioethical Committee (reference no. 4-87/NBC-471-COVID-19-09/20/). The names of interlocutors have been anonymized to maintain confidentiality.

TABLE 1 | Characteristics of interlocutors.

Gender	Age	Religion	Qualification	Income per month in US$	Living area	Duty station	Ward	Position
Male	45	Hinduism	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	43	Islam	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	43	Islam	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	37	Islam	MBBS/MD	2,100	Urban	DHQ	Isolation ward	Surgeon
Male	43	Islam	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	42	Hinduism	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	45	Islam	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	53	Islam	MBBS/FCPS	3,000	Rural	THQ	Isolation ward	Surgeon
Male	57	Islam	MBBS/FCPS	3,200	Rural	THQ	Isolation ward	Surgeon
Male	50	Islam	MBBS/FCPS	3,000	Rural	THQ	Isolation ward	Surgeon
Male	48	Islam	MBBS/FCPS	2,800	Rural	THQ	Isolation ward	Surgeon
Male	43	Islam	MBBS/MD	2,100	Rural	THQ	Isolation ward	Surgeon
Male	50	Islam	MBBS/FCPS	3,000	Urban	THQ	Isolation ward	Surgeon
Male	40	Islam	MBBS	2,000	Urban	DHQ	Isolation ward	Duty Doctor
Female	32	Islam	MBBS	2,000	Urban	DHQ	Isolation ward	Duty Doctor
Female	40	Islam	MBBS	2,000	Urban	DHQ	Isolation ward	Duty Doctor
Female	40	Islam	MBBS/MD	2,800	Urban	DHQ	Isolation ward	Duty Doctor
Female	37	Islam	MBBS	2,100	Urban	DHQ	Isolation ward	Duty Doctor
Female	42	Islam	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon
Male	45	Islam	MBBS/FCPS	2,800	Urban	DHQ	Isolation ward	Surgeon

FIGURE 1 | A banner at the entrance of COVID-19 ward containing the Urdu translation of a Quranic verse.

Data Analysis

Although data analysis was ongoing from the first interview, the gathered data were subjected to content analysis. After transcribing the data into English, we continued reading and re-reading the data to gain familiarity with it and allowed for iteration. This transcription was followed by the data examination using thematic analysis and with the flexibility to extend, modify, and discard categories (30); this helped to identify the most salient themes. We then followed on by listing, summarizing, reviewing, and refining these various themes. Our analysis addressed the following questions: (1) How do doctors perceive COVID-19, and what practices did they perform to deal with it? (2) What kind of effects has the pandemic exerted on these frontline healthcare providers? (3) What are their perceptions of the government's policies and practices around dealing with the pandemic? The data obtained were eventually organized in terms of these questions and verbatim responses of interlocutors, which we present below. We grounded our categories in our data and theoretical framework (31) while agreeing with Dey [(30), p. 17], "There is no single set of categories waiting to be discovered. There are as many ways of "seeing" data as one can invent."

BACKGROUND AND CONTEXT

Although it has been mentioned by several studies [e.g., (32, 33)], in this section, we provide a brief overview of COVID-19 in Pakistan, and especially in Sindh province, to give our readers an idea of the overall situation with which our interlocutors are having to cope. Pakistan reported its first infection of COVID-19 in two men who returned from Iran on February 26, 2020. Although the government implemented several measures for containing the virus and "flattening the curve," over time, infections increased. At the beginning of the pandemic, the Pakistani government suspended flights to and from several countries, such as China, Iran, Qatar, and Italy (34). In the absence of test kits in the country, the government sent specimens to China and the USA and, afterward, imported around 1,000 kits from China (34). On March 13, 2020, when the virus had infected only around 30 people, the government closed educational institutions and the border with Afghanistan and opened a quarantine camp for COVID-infected people at the Pak-Iran border. Later on, the country banned congregations, such as conferences and gatherings, both formal and informal. On March 17, 2020, on the basis of the information that 97% of patients have recovered, the Prime Minister of the country ruled out the option of countrywide lockdown (34). Nevertheless, the Sindh government implemented a lockdown in the province.

Afterward, the federal government did implement a countrywide lockdown, deployed security forces to enforce the preventive measures, such as forcing the entry of COVID+ people into quarantine centers, invoked Section 188 of the Pakistan Penal Code for any violations, monitored inter-provincial borders, closed the markets, created a Corona Relief Tiger Force to educate people about the critical consequences, distributed food items among daily wage laborers, and approved a PKR1.2 trillion economic relief package (34).

On May 9, 2020, the government lifted the countrywide lockdown due to its devastating effects on the economy and introduced and implemented a "smart" lockdown to keep only virus hotspots under lockdown. Under this smart lockdown, educational and training institutions, sporting, social and religious events, restaurants (except for take-away), marriage halls, cinemas, and business centers were closed.

When we first wrote this study in December 2020, the "smart" lockdown was still under operation, yet many people had long been and are still arranging gatherings and organizing marriage ceremonies. By December 30, 2020, Pakistan had reported COVID-19 infection in over 475,000 people, out of which around 10,000 had "officially" died. This very small number of deaths and cases out of a population of 22 billion seem a government fabrication to make it appear that they are doing an excellent job of coping with COVID-19 (35). Moreover, particular socio-cultural, economic, and political factors create a breeding ground for the virus to exert severe consequences in the country (32); we detail some of these below. As of August 2021, "smart" lockdown is still in place in some cities, such as Islamabad. There was great confusion and contestation going on between the political parties as to whether the cities should be locked down or not and between the federal government and provincial governments, as the Sindh government announced a province-wide lockdown in Sindh province, for which the federal government criticized the Sindh government. Nonetheless, later on in August 2021, the former government did implement a countrywide lockdown as the number of infections increased. By mid of August 2021, ∼1,095,000 had contracted the virus and around 24,500 had died.

Views of the doctors, uncertainties, fears, and anxieties as described in this study should also be situated within the overall context of the healthcare system of Pakistan, which suffers from serious issues of untrained staff, lack of staff, such as lack of doctors, insufficient medicines and medical tools, overcrowding in health facilities, the rural-urban divide in access to the healthcare system, and corruption (36). For example, Pakistan has only one doctor per around 1,000 people; one dentist per around 9,450; and one hospital bed per over 1,600 people. There are around 1,300 public sector hospitals, 5,530 Basic Health Units (BHUs), 700 Rural Health Centers (RHCs), and 5,680 dispensaries. There is a significant difference between rural and urban areas in terms of access, affordability, and effectiveness of the healthcare system: This has been called the "rural-urban bias" (36).

RESULTS AND DISCUSSION

This section presents the study results, discussing them in relation to other studies conducted in Pakistan. Since healthcare providers are the ones who directly encounter COVID-19-positive people, it is highly pertinent to study and analyze their knowledge, attitudes, perceptions, and practices toward COVID-19 (25). As previously noted, some studies have found substantial associations between gender, age, and DAS in healthcare providers in Pakistan (26, 27). Likewise, we have focused on the same thematic area but from a different geographical region and from an anthropological perspective. Moreover, our study focuses specifically on biomedical doctors, whereas others have focused on healthcare providers in general or on specific types of providers that have not included doctors.

Knowledge and Perceptions of COVID-19 Among Pakistani Physicians in Sindh Province

Since all interlocutors were medical doctors, they understood the fundamental biomedical characteristics of the virus: (1) COVID-19 is a viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2); (2) physical contact and droplets from sneezing and coughing are some of the causes of its spread; and (3) it causes respiratory tract infection. They also understood that the novel coronavirus was first reported in Wuhan city of China and that, thereafter, WHO had declared it a global pandemic.

Nonetheless, a few of them also related the pandemic to the conspiracy theories that have been circulating in Pakistan (32, 37, 38). One doctor confided, "COVID-19 is a tool of proxy war and the consequence of a lab experiment." Another physician postulated, "I think this pandemic is planned, and I feel this will end once the purpose is being served." Yet they gave no information on why they had these thoughts, what they meant by "proxy war," or what "purpose" they felt was being served. When asked further about these issues, these doctors refused to speak more deeply about them, perhaps out of fear of government reprisal; though their names are not provided in this article.

Social and Psychological Effects: Fears, Anxiety, and Habituation

All of our 20 physician interlocutors agreed that COVID-19 has impacted them and other healthcare providers socially, mentally, and economically, leading to massive stress and anxiety about becoming infected and infecting others. They are limited to contacts with only close family members; thus, they know that the ones they could infect are their nearest and dearest. The primary coping mechanisms they have developed include an attitude of optimism and carefully following standard operating procedures (SOPs) at every step while carrying out their hospital duties. One doctor stated, "I am maintaining SOPs, avoiding regular contact with anyone, and eating healthy foods for immunity." Another doctor emphasized his faith in PPE, "I am unafraid of COVID-19. I respond positively to incoming patients by observing SOPs such as using gloves, masks, sanitizers, soaps, and other materials to protect myself. If you prevent yourself [from getting infected], you will protect others." Another interlocutor agreed:

> Many changes have occurred in my life since COVID-19 began—from maintaining physical distance, literally staying away from patients and family members with specific thoughts and anxieties that can I also infect my own family members. Although coping with these effects was not easy, practicing SOPs once again proved a relief in maintaining harmony between my conscience and duty.

Clearly, these physicians view PPE as an effective buffer against self-contagion and infecting others. Yet they still suffered from the physical distancing measures, they felt they had to employ. One doctor explained, "COVID-19 has affected me socially as I have to keep a distance from everyone." Another doctor also discussed the social effects of the pandemic, "We cannot meet our families. Everything is different at home. To relieve stress, we are in touch with people through phone and video calling. Distancing from loved ones is quite challenging for me."

Another doctor acknowledged that "In dealing with COVID-19 patients, I have some phobia. Otherwise, it is the best experience" to serve during these challenging times. Another explained how he has habituated to the realities of COVID:

> While taking care of people infected with COVID-19, I have experienced growing fear and anxiety. On the first day, I was nervous about myself and my family. I was petrified to visit infected people, and my fear [of infection] increased continuously. However, now I have adapted to the unique environment of the hospital, and I can manage people infected by this virus with precautionary measures. The most challenging things were the psychology of infected people, as they were fearful. I have continually counseled them. It's been challenging times because no proper research is available, but only prophylactic treatment. Initially, I felt fear, but now I am used to handling the pandemic.

Another interlocutor also described his habituation:

> At first, I was very much worried about the health of my family members. I was thinking to move to another place, but now I am used to it, which has relieved my social and mental disturbances.

Yet many of our interlocutors remained focused on their fears for their families and their distress over the lack of contact with family members:

> It has challenged my life. I am anxious about how to protect myself, family members, and colleagues because I have seen those patients who are affected by COVID-19 in a critical situation.
>
> I feel incredibly sad when my family feels fear from me, avoid touching me or my belongings. Every time I go [home], I need to clean or sanitize myself.
>
> I am worried about my family and friends, thus, am trying to avoid close contact with them. I also follow the SOPs at home and workplace.
>
> I am not even afraid of death but worried about loved ones who can be infected by me.
>
> Being a healthcare provider working in COVID-19 wards causes significant stress, as I have been thinking of family. If I got infected, it might infect and affect my family.
>
> I always feel anger and frustration due to my work as I am worried about the health of my loved ones.
>
> I fear contracting the disease and I don't want to put my family and friends at risk, so I feel we all should take proper precautionary measures.
>
> The main problem includes dealing with COVID-19 infected people and being exposed to the infection and being afraid of spreading it to my family members. As a result, I am substantially affected and physically distancing.
>
> Although taking care of the patient is part of my job's responsibility, I am conscious of my loved ones due to my work's nature.

This doctor expressed the stigmatization that can occur to frontline workers:

> At the start of the outbreak, I did not even allow myself to contact other people, especially my elder family members like grandparents, since they were vulnerable due to age. Most of my family members treated me as if I were the virus. After working in a COVID-19 ward, everyone avoids us [healthcare providers] as they think that we are a carrier of the virus.

In addition, this doctor described a new worry: people's resistance to following SOPs:

> In the first phase, where cases were high and rapidly increasing in number, most community members were self-quarantining themselves, which ultimately relieved us and saved us from exposure to the virus. However, now it is very usual: nobody is taking precautions, even our management and so-called public health experts.

This last quotation indicates that since the coronavirus at that point had been around for several months, and now (August 2021) has been around for a year-and-a- half, Pakistanis are used to its presence and, probably due to the low death rate from the virus as reported by the government, are not taking it as seriously as they initially did. This may be a global problem—for example, in many cities in the United States, traffic levels are back to normal as people resume movement, more people are traveling on airplanes, and many are no longer wearing masks, despite the latest coronavirus wave of the Delta variant and the rapidly increasing number of infections in that country. According to the US citizen Robbie Davis-Floyd (personal communication, January 2021), people in the US are getting "COVID-ed out" and are "in denial" about the still-pressing need to take every precaution. The same seems true in Pakistan, and this situation represents a clear and present danger for all. As of August 6, 2021, around half of the US population had been fully vaccinated; the new, mostly Delta variant, infections are clustering in the

US states with low vaccination rates and high vaccine resistance (Chamberlain 2021) https://www.reuters.com/world/us/half-us-population-fully-vaccinated-against-covid-19-cdc-2021-08-06/. Vaccines have arrived in Pakistan, and around 10% of the population has been vaccinated (https://leadpakistan.com.pk/news/covid-19-pakistans-10-pct-population-fully-vaccinated/, leaving a long way to go, which, as in the US, will be rendered more difficult by high levels of vaccine mistrust, especially amid the rural population. Meanwhile, a number of infected people are still growing in both countries and others—not to mention the recent viral mutations being experienced in the UK and Ireland, which may spread well and render the current vaccines ineffective.

New Knowledge, Opportunity, Responsibility, and Guilt

Despite their anxiety and fear, some of our interlocutors considered the pandemic as an opportunity to gain new knowledge. One physician stated, "In contrast to its effects on healthcare professionals, this new disease has increased our existing knowledge, specifically on how to deal with a pandemic." Similarly, another doctor stated, "Dealing with minor and major complications faced by patients is a bit challenging, but it feels great to be a part of it to learn new things." Another doctor added, "It is quite a great experience. We are learning many new things. Since we had never dealt with a pandemic previously, we doctors were afraid of getting infected; thus, we needed to gain the first-hand experience to deal with C+ people."

Our interlocutors often found themselves "between a rock and a hard place," when they simultaneously invoked their responsibility to serve humanity and noted their guilt should they fail to do so. One doctor argued, "Although I am doing my job, sometimes I still get that feeling of guilt that I am not doing my duty to keep these people safe." Four other doctors stated similar, yet differing, aspects of their feelings of both responsibility and guilt:

> It is an inconvenient situation around the globe. Being a health professional, it's our responsibility to serve humanity. This is our duty to take better care of COVID-19 patients instead of succumbing to fear of getting infected.
>
> As healthcare providers, our work is to face any critical situation. It's quite a challenging and a new experience, although the fear of being infected has become a part of our lives.
>
> I feel proud to serve humanity, and I feel no fear while attending to patients with various diseases, including COVID-19. Nonetheless, I maintain the required SOPs, especially PPEs.
>
> Saving the lives of humans is the responsibility of doctors. That is why I like this profession more because I serve humanity. I don't fear being infected. If it is God's will and in my destiny, then no one can turn it away.

This latter quote indexes the deep belief of Pakistanis in the cultural concept of *Qismat*, or "fate" — the notion that one's destiny is predetermined and inevitable. Nonetheless, Pakistanis, in general, do try to affect their destinies *via* prayer, the performance of religious rituals and, in the case of COVID, *via* the conscientious use of PPE—at least in urban areas, rural people living in small communities are far less likely to use PPE and far more likely to use ritual and prayer. Some rural people in Sindh province do not even believe that COVID-19 exists; they too consider it to be a "Western plot" or conspiracy (33).

Fear of Syndemics

The "syndemics" — synergistic and epidemic—approach was introduced by Merrill Singer (39); it also combines the idea of "synergy" with "epidemic" and recognizes that diseases in a population are significantly related to sociocultural, economic, political, and ecological factors. In addition, syndemics entail the problematic interaction of two or more diseases adversely affected by such conditions. Thus, we employ this term to mean interactions between/among various infectious diseases that cause severe complications, such as death as due to such critical interactions; for example, some of our interlocutors had more anxiety related to their older age and preexisting comorbidities. As one doctor worried, "Yes, of course, my age is a problem, which makes me among the at-risk people to be infected and develop severe complications." Another doctor was diabetic: "On my first day, I was a little afraid because I had diabetes, thus I might be infected. I was the first person to work at a COVID isolation ward at my hospital. Initially, PPE was unavailable."

The syndemics of COVID-19 have already been studied, especially in the contexts of diabetes, hypertension, and cardiovascular diseases (35, 40, 41). Some studies have explored the strong relationships between diabetes, chronic kidney disease (CKD), and COVID-19 (40, 42). Ssentongo et al. (43) showed that people with several underlying conditions, such as cardiovascular disease, hypertension, diabetes, and CKD, are at considerable risk of death from COVID-19 infection compared to people without these comorbidities. For example, in their sample of around 800 people who died after contracting COVID-19, Chen et al. (44) found that 28% of those who died had CKD.

Opinions of Doctors of Government Viral Containment Measures

Concerning the efforts of the government to slow the viral spread and supply healthcare providers with the necessary PPE, our interlocutors shared mixed responses. Some doctors were satisfied with the dealings of the government with the pandemic. They felt that the government did allocate sufficient funds and sufficient PPE. For instance, one doctor argued:

> I feel that the government has strong prevention and control measures. That is why the pandemic will be controlled very soon. However, after all, we have a large population, and many people are not serious about the pandemic. Thus, the government's role is greatly challenged.

Yet other doctors were critical about the role of the government, arguing that its preventive measures were insufficient. For example, one doctor explained that "COVID-19 has disturbed me economically due to an increase in expenditures to buy sanitizers and masks." Although the government has repeatedly stated that it will provide full PPE to healthcare practitioners, these words of the doctor reveal that it has not done so sufficiently, possibly due to the corruption that is chronic in the country, including in the healthcare system.

These physicians felt that the government should heighten its efforts to control the pandemic by, for example, providing healthcare facilities with maximum screening kits, as Pakistan lacks the large-scale screening measures that would enable it to better prevent viral spread. Moreover, these doctors want to see strict government implementation of preventive measures, such as physical distancing and eliminating handshaking.

When the Pandemic May End: The Contrast Between Religious and Biomedical Beliefs

According to some of our interlocutors, this disease "will never go away but will live with us in the future. Only we can protect ourselves by observing COVID-19 SOPs." In contrast, one doctor believes that "Only Allah can end this spread as soon as possible." These two quotes are very intriguing for the collision of cultures and belief systems they represent: the strong Muslim cultural and religious belief in the power of Allah, and the belief common in a biomedical culture that individuals can protect themselves when they have sufficient information about how to do so.

Although these doctors are trained in biomedical science, many determinately believe in a supernatural resolution.[1] In every public and private hospital in Pakistan and even in clinics primarily for Hindus, there are either pamphlets hung on the walls or writings on the walls containing the Quranic verses that insist that no one can cure a disease but Allah. For instance, one verse reads, "And when I fall ill, it is He who restores me to health" (*Quran* 26:81) (see **Figure 1**). From this religious perspective, doctors can try as they might, but the primary protagonist is always Allah. This strong belief can work to absolve biomedical practitioners from guilt over a death they could not prevent and to give them faith that the death was the will of Allah. Yet if carried to its extreme, this belief would render biomedical efforts at healing pointless—and thus, in medical facilities, the biomedical belief that something can be done must prevail—despite those inscriptions on the walls.

Most laypeople in Pakistan also hold this religious belief, and therefore many consider the pandemic to be a "supernatural test" of their faith; thus, they have focused on performing religious rituals and reciting prayers and Quranic verses more than they have on taking preventive measures. After all, if it is Allah who determines your fate, would you not be better served by praying to Him? Even the Pakistani government arranged a communal, nationwide, televised prayer at the beginning of the pandemic (45).

As to its possible end, about which another doctor implored, "I just hope it ends soon as it's affecting thousands of people globally," some of our interlocutors suggested that once the pandemic winds down, all preventive measures at home and work should continue to be practiced to avoid the spread of other infectious diseases, such as colds, the flu, the measles, and polio—of which Pakistan continues to have sporadic outbreaks due to lack of vaccination coverage (46). Moreover, other vaccine-preventable diseases, such as maternal tetanus, also still occur in the country for the same reason (47).

STUDY LIMITATIONS AND STRENGTHS

This study has several strengths and limitations. Its greatest strength is that it is the first anthropological study from Pakistan to address the effects of COVID-19 on physicians as frontline healthcare providers. No other anthropological study has been conducted from that standpoint. There are studies from public health/epidemiological perspectives and from other geographical areas of Pakistan focusing on the knowledge, perceptions, and practices of other types of healthcare providers who have dealt with COVID-19-positive people. Yet, studies from Sindh province are scant. The limitation of this study lies in its small sample size of only 20 interviews with doctors in Sindh province; its results could be strengthened with a higher sample size and by the inclusion of doctors from other regions of the country. In addition, this study involved only biomedical doctors, whereas other studies have focused on other healthcare providers. Therefore, we suggest further research across the country. Regarding the sample size, we also would like to re-emphasize that, for the most parts, ethnographic studies do tend to engage with a smaller sample size, as their main strength lies in their detailed qualitative accounts. As far as we know, prior to our study, there is not a single study that has also focused on what biomedical doctors think about governmental measures and how they perceive the potential end of the pandemic.

CONCLUSIONS

This study of biomedical physicians from the Sindh province of Pakistan has shown that while all interlocutors perceived the virus from a biomedical perspective, some considered it as a "proxy war's tool" and "the consequence of a lab experiment," or a "plot," without mentioning its agency or purpose. All believed in biomedical treatment, while some also believed that living or dying from COVID-19 was up to Allah. We have shown how COVID-19 has affected our interlocutors socially, psychologically, and economically. Socially, they had to be overcautious to maintain physical distancing, such as from their family members. Psychologically, they suffered stigmatization as suspected viral carriers and also suffered from lack of physical contact with family members—or having contact with them yet constantly being afraid of infecting them. They suffered as well from anxiety and fear of being infected or developing severe symptoms due to the "syndemics effect" that we described. Economically, a few interlocutors indicated an increase in their

---

[1] Although unrelated to our actual interlocutors, we have seen a doctor in Sindh province who has clearly displayed a notice at the entrance to his facility stating that people of one specific Islamic sect are not allowed to enter his hospital. He will not treat them, as he believes that the Holy Prophet Muhammad would not want him to do so, due to their "erroneous" beliefs. His action reveals a different contestation, in which power, politics, religion, and biomedicine are intricately entangled. Moreover, his action belies those beliefs of our interlocutors that they should serve all of humanity. Undoubtedly, most of them do prioritize humanity. However, the smaller number of doctors who value religion over science and biomedicine are critical indications of the religious extremism extant in the country—extremism that is rooted in history and (geo-)politics.

expenditures to buy PPE, which they believed should have been supplied freely by the government, as had been promised. Some were satisfied with the dealings of the government with the pandemic, whereas others showed great dissatisfaction and felt that much more should be done. Overall, these doctors keenly felt their responsibilities as frontline care providers and experienced guilt when they felt that they were not "doing enough." Precisely because these physicians are essential frontline care providers in this pandemic, we believe in the importance of capturing and presenting their voices, their feelings, and their experiences.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because due to ethical reasons, we cannot share the dataset. Nonetheless, our paper contains interlocutors' responses in the original at several places. Requests to access the datasets should be directed to inayat_qau@yahoo.com.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Pakistan's National Bioethical Committee (reference No.4-87/NBC-471-COVID-19-09/20/). Informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

IA did conceptualization, wrote the first draft, contributed to analysis, revision, and validation. SS did data collection, wrote the first draft, revision, analysis, and validation. SA did revision, analysis, and validation. All authors contributed to the article and approved the submitted version.

FUNDING

IA acknowledges the Higher Education Commission (HEC) of Pakistan's grant (PD/OSS-II/Batch-IV/Austria/2012/9903), which supported the Ph.D., work that has significantly informed this article.

ACKNOWLEDGMENTS

Our sincere thanks go to Robbie Davis-Floyd, who has helped us immensely in terms of commenting on and editing this manuscript. We also thank our interlocutors who gave their precious time and views.

REFERENCES

1. Maunder R, Hunter J, Vincent L, Bennett J, Peladeau N, Leszcz M, et al. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ.* (2003) 168:1245–51.
2. Khalid I, Khalid TJ, Qabajah MR, Barnard AG, Qushmaq IA. Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. *Clin Med Res.* (2016) 14:7–14. doi: 10.3121/cmr.2016.1303
3. Park J-S, Lee E-H, Park N-R, Choi YH. Mental health of nurses working at a government-designated hospital during a MERS-CoV outbreak: a cross-sectional study. *Arch Psychiatr Nurs.* (2018) 32:2–6. doi: 10.1016/j.apnu.2017.09.006
4. Chen W-K, Cheng Y-C, Chung Y-T, Lin C-C. The impact of the SARS outbreak on an urban emergency department in Taiwan. *Med Care.* (2005) 43:168–72. doi: 10.1097/00005650-200502000-00010
5. Dai Y, Hu G, Xiong H, Qiu H, Yuan X. Psychological impact of the coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. *MedRxiv.* (2020) 1–22. doi: 10.1101/2020.03.03.20030874
6. Chew NW, Lee GK, Tan BY, Jing M, Goh Y, Ngiam NJ, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain Behav Immun.* (2020) 88:559–65. doi: 10.1016/j.bbi.2020.04.049
7. Zhang SX, Liu J, Jahanshahi AA, Nawaser K, Yousefi A, Li J, et al. At the height of the storm: healthcare staff's health conditions and job satisfaction and their associated predictors during the epidemic peak of COVID-19. *Brain Behav Immun.* (2020) 87:144–6. doi: 10.1016/j.bbi.2020.05.010
8. Naser AY, Dahmash EZ, Al-Rousan R, Alwafi H, Alrawashdeh HM, Ghoul I, et al. Mental health status of the general population, healthcare professionals, and university students during 2019 coronavirus disease outbreak in Jordan: a cross-sectional study. *Brain Behav.* (2020) 10:e01730-1-13. doi: 10.1002/brb3.1730
9. Cao J, Wei J, Zhu H, Duan Y, Geng W, Hong X, et al. A study of basic needs and psychological wellbeing of medical workers in the fever clinic of a tertiary general hospital in Beijing during the COVID-19 outbreak. *Psychother Psychosom.* (2020) 89:252–4. doi: 10.1159/000507453
10. Mo Y, Deng L, Zhang L, Lang Q, Liao C, Wang N, et al. Work stress among Chinese nurses to support Wuhan in fighting against COVID-19 epidemic. *J Nurs Manage.* (2020) 28:1002–9. doi: 10.1111/jonm.13014
11. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease (2019). *JAMA Netw Open.* (2020) 3:e203976. doi: 10.1001/jamanetworkopen.2020.3976
12. Liu X, Shao L, Zhang R, Wei Y, Li J, Wang C, et al. Perceived social support and its impact on psychological status and quality of life of medical staffs after outbreak of SARS-CoV-2 pneumonia: a cross-sectional study. *SSRN.* (2020) 3541127. doi: 10.2139/ssrn.3541127
13. Lu W, Wang H, Lin Y, Li L. Psychological status of medical workforce during the COVID-19 pandemic: a cross-sectional study. *Psychiatry Res.* (2020) 288:112936. doi: 10.1016/j.psychres.2020.112936
14. Fang X-H, Wu L, Lu L-S, Kan X-H, Wang H, Xiong Y-J, et al. Analysis on mental health status and needs of health care workers in designated medical institutions of tuberculosis during the epidemic period of COVID-19. *Res Squire.* (2020) 1–16. doi: 10.21203/rs.3.rs-25934/v1
15. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, et al. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry.* (2020) 7:e15–6. doi: 10.1016/S2215-0366(20)30078-X
16. Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: mental health consequences and target populations. *Psychiatry Clin Neurosci.* (2020) 74:281–2. doi: 10.1111/pcn.12988
17. Huang JZ, Han M, Luo T, Ren A, Zhou X. Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi.* (2020) 38:192–5. doi: 10.3760/cma.j.cn121094-20200219-00063
18. Kang L, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry.* (2020) 7:e14. doi: 10.1016/S2215-0366(20)30047-X
19. Xiang Y-T, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry.* (2020) 7:228–9. doi: 10.1016/S2215-0366(20)30046-8

20. Braquehais MD, Vargas-Cáceres S, Gómez-Durán E, Nieva G, Valero S, Casas M, et al. The impact of the COVID-19 pandemic on the mental health of healthcare professionals. *QJM*. (2020) 113:613–7. doi: 10.1093/qjmed/hcaa207
21. Sandesh R, Shahid W, Dev K, Mandhan N, Shankar P, Shaikh A, et al. Impact of COVID-19 on the mental health of healthcare professionals in Pakistan. *Cureus*. (2020) 12:1–5. doi: 10.7759/cureus.8974
22. Khattak SR, Saeed I, Rehman SU, Fayaz M. Impact of fear of COVID-19 pandemic on the mental health of nurses in Pakistan. *J Loss Trauma*. (2020) 26:421–35. doi: 10.1080/15325024.2020.1814580
23. Munawar K, Choudhry FR. Exploring stress coping strategies of frontline emergency health workers dealing Covid-19 in Pakistan: a qualitative inquiry. *Am J Infect Control*. (2020) 49:286–92. doi: 10.1016/j.ajic.2020.06.214
24. Rana W, Mukhtar S, Mukhtar S. Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. *Asian J Psychiatr*. (2020) 51:102080. doi: 10.1016/j.ajp.2020.102080
25. Hussain I, Majeed A, Imran I, Ullah M, Hashmi FK, Saeed H, et al. Knowledge, attitude, and practices toward COVID-19 in primary healthcare providers: a cross-sectional study from three tertiary care hospitals of Peshawar, Pakistan. *J Commun Health*. (2021) 46:441–9. doi: 10.1007/s10900-020-00879-9
26. Mahmood QK, Jafree SR, Jalil A, Nadir SMH, Fischer F. Anxiety amongst physicians during COVID-19: cross-sectional study in Pakistan. *BMC Public Health*. (2021) 21:118. doi: 10.1186/s12889-020-10134-4
27. Arshad MS, Hussain I, Nafees M, Majeed A, Imran I, Saeed H, et al. Assessing the impact of COVID-19 on the mental health of healthcare workers in three metropolitan cities of Pakistan. *Psychol Res Behav Manage*. (2020) 13:1047. doi: 10.2147/PRBM.S282069
28. Sandelowski M. Theoretical saturation. In: Given LM, editor. *The Sage Encyclopedia of Qualitative Research Methods*. Thousand Oaks, CA: Sage (2008). p. 875–6.
29. Barton TD. Student nurse practitioners–A rite of passage? The universality of Van Gennep's model of social transition. *Nurse Educ Pract*. (2007) 7:338–47. doi: 10.1016/j.nepr.2006.11.005
30. Dey I. *Qualitative Data Analysis: A User Friendly Guide for Social Scientists*. London: Routledge (2003). doi: 10.4324/9780203412497
31. Ryan GW, Bernard HR. Techniques to identify themes. *Field Methods*. (2003) 15:85–109. doi: 10.1177/1525822X02239569
32. Ali I. Impacts of rumors and conspiracy theories surrounding COVID-19 on preparedness programs. *Disaster Med Public Health Prep*. (2020) 1–6. doi: 10.1017/dmp.2020.325
33. Ali I, Sadique S, Ali S. COVID-19 and vaccination campaigns as "western plots" in Pakistan: government policies, (geo-) politics, local perceptions, and beliefs. *Front Sociol*. (2021) 6:82. doi: 10.3389/fsoc.2021.608979
34. Imran U. *'Ghabrana Nahi Hai!': Here's Everything Pakistan Has Done so Far to Fight the Coronavirus Pandemic*. Islamabad: Dawn (2020).
35. Ali I. Syndemics at play: chronic kidney disease, diabetes and COVID-19 in Pakistan. *Ann Med*. (2021) 53:581–6. doi: 10.1080/07853890.2021.1910335
36. Zaidi SA. The urban bias in health facilities in Pakistan. *Soc Sci. Med*. (1985) 20:473–82. doi: 10.1016/0277-9536(85)90362-4
37. Ali I. COVID-19: are we ready for the second wave? *Disaster Med Public Health Prep*. (2020) 14:e16–8. doi: 10.1017/dmp.2020.149
38. Ali I. The COVID-19 pandemic: making sense of rumor and fear. *Med Anthropol*. (2020) 39:376–9. doi: 10.1080/01459740.2020.1745481
39. Singer M. *Introduction to Syndemics: A Critical Systems Approach to Public and Community Health*. San Francisco, CA: John Wiley & Sons (2009).
40. Singer M. Deadly companions: COVID-19 and diabetes in Mexico. *Med Anthropol*. (2020) 39:660–5. doi: 10.1080/01459740.2020.1805742
41. Yadav UN, Rayamajhee B, Mistry SK, Parsekar SS, Mishra SK. A syndemic perspective on the management of non-communicable diseases amid the COVID-19 pandemic in low-and middle-income countries. *Front Public Health*. (2020) 8:508. doi: 10.3389/fpubh.2020.00508
42. Wang A, Zhao W, Xu Z, Gu J. Timely blood glucose management for the outbreak of 2019 novel coronavirus disease (COVID-19) is urgently needed. *Diabetes Res Clin Pract*. (2020) 162:108118. doi: 10.1016/j.diabres.2020.108118
43. Ssentongo P, Ssentongo AE, Heilbrunn ES, Ba DM, Chinchilli VM. Association of cardiovascular disease and 10 other pre-existing comorbidities with COVID-19 mortality: a systematic review and meta-analysis. *PLoS ONE*. (2020) 15:e0238215. doi: 10.1371/journal.pone.0238215
44. Chen T, Wu D, Chen H, Yan W, Yang D, Chen G, et al. Clinical characteristics of 113 deceased patients with coronavirus disease 2019: retrospective study. *BMJ*. (2020) 368:m1091. doi: 10.1136/bmj.m1091
45. Ali I, Davis-Floyd R. The interplay of words and politics during COVID-19: contextualizing the universal pandemic vocabulary. *Pract Anthropol*. (2020) 42:20–4. doi: 10.17730/0888-4552.42.4.20
46. Ali I. Impact of COVID-19 on vaccination programs: adverse or positive? *Hum Vaccin Immunother*. (2020) 16:2594–600. doi: 10.1080/21645515.2020.1787065
47. Iqbal S, Ali I, Ekmekcioglu C, Kundi M. Increasing frequency of antenatal care visits may improve tetanus toxoid vaccination coverage in pregnant women in Pakistan. *Hum Vaccin Immunother*. (2020) 16:1529–32. doi: 10.1080/21645515.2019.1705693

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.