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Health and well-being, quality education, gender equality, decent work and inequalities: The contribution of psychology in achieving the objectives of the Agenda 2030

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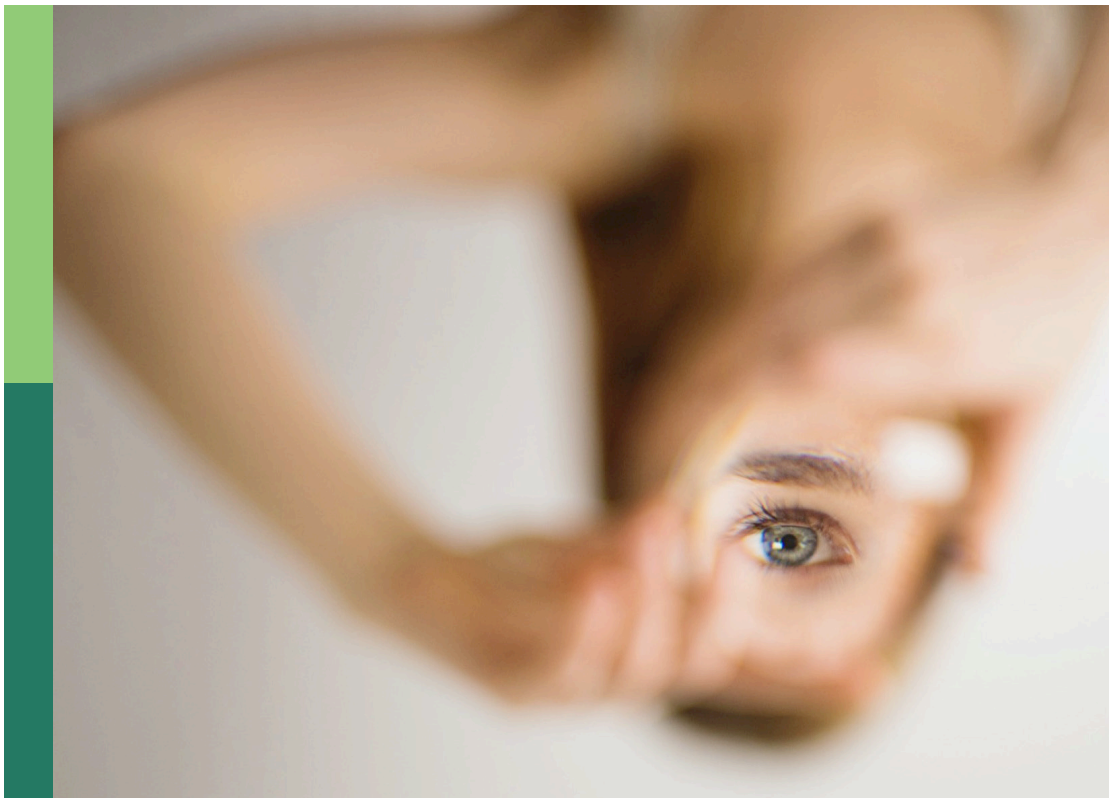

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Health and well-being, quality education, gender equality, decent work and inequalities: The contribution of psychology in achieving the objectives of the Agenda 2030

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Editorial: Health and well-being, quality education, gender equality, decent work and inequalities: the contribution of psychology in achieving the objectives of the Agenda 2030

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Editorial on the Research Topic
Health and well-being, quality education, gender equality, decent work and inequalities: the contribution of psychology in achieving the objectives of the Agenda 2030

The United Nations 2030 Agenda has defined 17 goals to promote sustainable development. Many of the goals can be connected to psychology or educational sciences, for example, improving health and wellbeing (SDG3), ensuring quality education (SDG4), promoting gender equality (SDG5) and decent work (SDG8), and reducing inequality (SDG10). The achievement of these goals requires the willingness at different levels (social, political, economic, legal, and psychological) to promote pathways toward sustainable scenarios, which go through the modification of the current development trends. In this regard, it becomes essential to increase the awareness and reflection of people on the issues that are discussed within the 2030 Agenda.

The research by Di Fabio et al. delves into the importance of building positive and supportive relationships as a fundamental aspect for healthy workers and organizations to cope with the current challenging work scenario. The results of this research underlined the value of positive relational management in relation to human capital sustainability leadership in organizations. In addition, connectedness and respect emerged as dimensions of positive relational management primarily associated with human capital sustainability leadership, and the authors suggest that these two dimensions could be assessed with greater attention in research and interventions aimed at studying and fostering positive relational management to promote human capital sustainability leadership.

Yousefi Afrashteh and Janjani focused on evaluating the mental state of Iranian adolescents between 11 and 18 years of age. Specifically, this research examined the psychometric properties of the Persian version of the MHC-SF (Keyes et al., 2008). The authors established that the MHC-SF is a psychometrically valid questionnaire for general mental wellbeing.

Di Fabio et al. conducted a study on 284 Italian university students, drawing on the perspective of the psychology of sustainability and sustainable development (PSSD) (Di Fabio and Rosen, 2018, 2020), a current area of research that supports the sustainability culture. This study examined the associations between acceptance of change and wellbeing, controlling for the effects of personality traits. The results obtained by the authors (acceptance of change explained additional variance over personality traits regarding hedonic and eudaimonic wellbeing) contribute to opening new perspectives for intervention; to improve wellbeing, individuals can be supported to effectively deal with the mutable environments of the current century.

Camussi et al., in their article, involved 835 Italian women and investigated the attitudes about roles, responsibilities, and expectations related to motherhood, as well as potential barriers people may encounter in their careers and values. Results show (1) a significant difference between the number of children women plan and the ideal number of children they would like; and (2) the parenthood choice is connected to the perception of social and gender inequity. Adopting a life design perspective (Savickas et al., 2009), the authors highlight the need to implement policies to support the birth rate; it is necessary to remove the obstacles to allow people to realize their family and life plans, supporting Goal 5, "Gender Equality", and Goal 8, "Decent Work and Economic Growth", of the 2030 Agenda.

Creed et al. analyzed the situation faced by many young people, which is defined as integrating a dual identity of working and studying. This research focuses on understanding the factors that contribute to managing work and study well. The analysis identified four profiles: (a) "balanced", (b) "high work congruence and flexibility", (c) "low work congruence and flexibility", and (d) "low study congruence". The authors demonstrated the value of deploying a person-centered approach, suggesting that different groups will also require different types of support and intervention.

Cantos-Egea et al. demonstrated that people in a situation of social exclusion tend to accumulate risk factors; they are related to having fewer psychosocial and cognitive resources to cope with stressful situations. Furthermore, in the absence of social integration and purpose in life, self-perceived health statuses decline. The authors underline that reducing inequality (SDG10) can also contribute to achieving other objectives of the 2030 Agenda, such as improving health and wellbeing (SDG3), ensuring quality education (SDG4), and promoting gender equality (SDG5) and decent work (SDG8).

Sun explored the relationship between self-objectification and career aspirations among young women from the perspective of objectification theory (Fredrickson and Robets, 1997). She focused on Chinese undergraduate women ranging in age from 16 to 21 years. Results showed that self-objectification was negatively correlated with self-esteem, career decision-making self-efficacy, and career aspirations. Self-esteem and career decision-making self-efficacy, both independently and serially, mediated the association between self-objectification and career aspirations. These findings, Sun argues, provide a better understanding of the negative consequences of self-objectification on career aspirations.

The contribution of Leão et al. demonstrated the positive effects of nature on human health through the lens of Complex Adaptive Systems. His contribution is particularly relevant insofar as theoretical models in this area are poorly developed, and they construct their own model: "A time with e-Natureza" (e-Nature). This model not only looks at human wellbeing but also supports nature conservation and is based on four types of experiences: (1) esthetic and emotional experience, (2) multisensory integration experience, (3) knowledge experience, and (4) engagement experience. This integrated approach recognizes the mutual benefits of human–nature interaction and offers valuable insights for future research and practical applications in the fields of nature and health.

The study by Gramaxo et al. involved 2.708 participants with the aim of uncovering Portuguese students' perspectives concerning a happy school. To the question "What makes you happy in school?", the sample provided answers that underlined the importance of relationships with friends and teachers and teachers' attitudes, competencies, and capacities as elements of a happy school. On the contrary, excessive workload and bullying were at the root of school unhappiness. This study shows interesting results in understanding the happiness dimension of the Portuguese student population and is consistent with objective 4 of the 2030 Agenda, the promotion of quality education.

The study by Wang et al. was conducted on 1.172 primary school teachers. Through a survey research methodology, the authors found that technology use intensity directly impacted work–family conflicts and personal health and indirectly impacted them via the agency effects of Technostress. Furthermore, school support moderates the indirect relationship among technology intensity, work–family conflicts, and health issues. The findings of this study highlight the importance of promoting teacher wellbeing, which is consistent with Goal 3 of the 2030 Agenda regarding the promotion of health and wellbeing.

Espinoza-Díaz et al. analyzed the psychological wellbeing of teachers in relation to their professional performance. The aim of the study was to assess the influence of personality factors, emotional intelligence, burnout, and the psychosocial climate derived from the teachers' work environment on their levels of psychological wellbeing. The authors show that the main predictor of burnout in teachers is the perception of disorganization in the work environment. However, if emotional stability is high, this tends to be less affected.

Finally, Siqi and Hong examined the relationships among teaching-research conflict, career adaptability, justice climate, job burnout, and turnover intention. The research involved 858 Chinese university teachers. Results showed that job burnout mediates the relationship between teaching-research conflict and turnover intention; career adaptability plays a moderating role in the connection between job burnout and turnover intention; justice climate exhibits a cross-level interaction effect concerning the relationship between teaching-research conflict and turnover intention. These results show

evidence for the urgency of fostering equitable environments in higher education.

Studies have shown that, among researchers, there is a particular concern about one of the goals of the 2030 Agenda: improving mental health and wellbeing. Research results have pointed to the systemic nature of wellbeing, considering personal as well as contextual and environmental factors. Research in the field of psychology and educational sciences must stimulate the study and understanding of the dynamics that also underlie the other goals of the 2030 Agenda. Universities can contribute to achieving the goals of the 2030 Agenda by promoting sustainable behaviors and increasing the number of field research. The studies collected in this Research Topic provide a basis for researchers in psychology and related disciplines who can help to reflect on sustainable development goals.

Author contributions

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References

Di Fabio, A., and Rosen, M. A. (2018). Opening the black box of psychological processes in the science of sustainable development: a new frontier. *Eur. J. Sust. Dev. Res.* 2, 47. doi: 10.20897/ejosdr/3933

Di Fabio, A., and Rosen, M. A. (2020). An exploratory study of a new psychological instrument for evaluating sustainability: the sustainable development goals psychological inventory. *Sustainability* 12, 7617. doi: 10.3390/su12187617

Fredrickson, B. L., and Roberts, T.-A. (1997). Objectification theory: toward understanding women's lived experiences and mental health risks. *Psychol. Women Q.* 21, 173–206. doi: 10.1111/j.1471-6402.1997.tb00108.x

Keyes, C. L., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., and Van Rooy, S. (2008). Evaluation of the mental health continuum–short form (MHC–SF) in setswana-speaking South Africans. *Clin. Psychol. Psychother.* 15, 181–192. doi: 10.1002/cpp.572

Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J. P., Duarte, M. E., Guichard, J., et al. (2009). Life designing: a paradigm for career construction in the 21st century. *J. Vocat. Behav.* 75, 239–250. doi: 10.1016/j.jvb.2009.04.004

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Human capital sustainability leadership: From personality traits to positive relational management

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Introduction: Constructing positive and supportive relationships is fundamental for healthy workers and healthy organizations and to cope with the current challenging work scenario. Organizations need to acknowledge the relevance of the relationships for workers and organizational well-being and adopt managing practices that enhance healthy relationships for sustainability and sustainable development.

Methods: The current research sought to investigate the associations between positive relational management (PRM) and human capital sustainability leadership (HCSL), taking into account personality traits. The big five questionnaire (BFQ), the PRM Scale (PRMS), and the HCSL Scale (HCSLS) were administered to 191 Italian workers.

Results: Findings displayed that PRM was able to add incremental variance over personality traits referring to HCSL.

Discussion: In terms of strength-based prevention perspectives for healthy organizations, PRM may be a favorable construct linked to HCSL.

KEYWORDS

human capital sustainability leadership, positive relational management, personality traits, healthy organizations, healthy workers, healthy business, sustainable development, strength-based prevention perspectives

Introduction

The current era is marked by a challenging work landscape with incessant ongoing transitions (Peiró et al., 2014), endangering the workers' well-being (Di Fabio and Kenny, 2016b; Blustein et al., 2019). Constructing positive and supportive relationships is fundamental for healthy workers, healthy business, and healthy organizations (Di Fabio et al., 2020) in the current challenging scenario. Organizational environments need to recognize the value of the relationships for workers and organizational well-being (Blustein, 2011), as well as for reducing dysfunctional work-related correlates, such as occupational fatigue (Di Fabio et al., 2021), perfectionism (Di Fabio et al., 2022) fostering relevant assets (Di Fabio and Palazzeschi, 2012; Di Fabio et al., 2017; Palazzeschi et al., 2018; Duradoni and Di Fabio, 2019; Gori et al., 2022; Svicher et al., 2022a,b). It asks for incorporating managing practices that enhance healthy relationships for sustainability and sustainable development (Di Fabio and Peiró, 2018). In this framework the value of innovative leadership styles for Sustainability Science is recognized (Di Fabio, 2017a). The human capital sustainability leadership (HCSL; Di Fabio and Peiró, 2018) is an actual concept developed in the field of the psychology of sustainability and sustainable development (Di Fabio, 2017b; Di Fabio and Rosen, 2018) that introduces the psychological perspective as a lens to better understand processes related to the sustainable developmental goals issues (Di Fabio and Rosen, 2018), contributing to the trans-disciplinarity of the sustainability science (Rosen, 2009; Dincer and Rosen, 2013). This style of leadership is based on a higher order model (including sustainable, ethical, mindful,

servant leadership) that aims at promoting flourishing and resilient workers and at enhancing healthy organizations implementing a positive circuit of performance and long-term well-being (Di Fabio and Peiró, 2018).

In the psychology of sustainability and sustainable development framework it is recognized the importance of the strength-based prevention approach (Di Fabio and Saklofske, 2021), also considering primary prevention actions (Hage et al., 2007; Di Fabio and Kenny, 2015, 2016a), with a focus on enhancing positive resources increasable through trainings, unlike traits of personality usually considered more fixed (Costa and McCrae, 1992). Centering on positive resources for workers (Di Fabio et al., 2020) turned out to be essential for promoting healthy organizations. In this framework, managing positive relationships at work could be crucial for healthy and sustainable organizations (Di Fabio, 2017a, 2017b).

Relationships and relational experiences at work emerged as crucial aspects for successful performances (Kenny et al., 2003; Blustein, 2006). With reference to the relational theory of working (Blustein, 2011) and the Psychology of Working Framework and Theory (Blustein, 2013; Duffy et al., 2016), work is considered as an inherently relational act. The relational interactions among workers might therefore be regarded as essential aspects, emphasizing the relevance of generating positive circumstances to sustain optimal social connections in organizational settings in terms of flourishing relationships (Blustein et al., 1995; Blustein, 2013; Di Fabio, 2016). The goal should therefore be to facilitate individuals in building lives *via* work and relationships (Di Fabio and Blustein, 2016) with a positive-oriented approach which emphasizes the value of constructing positive relationships and support in the work environments (Di Fabio, 2017a). Positive relationships are a fundamental factor for the well-being of individuals (Blustein, 2011) and promoting positive relationships can increase well-being at work also fostering characteristics of decent work (Svicher et al., 2022a).

The relevance of a condition of well-being of human resources at work includes improving workers' opportunities to be able to adapt themselves to the shifting conditions and fluidity of the contemporary scenario (Di Fabio and Gori, 2016a, 2016b; Di Fabio and Peiró, 2018). In this current framework the value of positive relational management (PRM) emerged (Di Fabio, 2016). The construct of PRM (Di Fabio, 2016) is a strength for relational positive and productive adaptation to the context. It is constituted of three factors namely Respect, Caring, and Connectedness (Di Fabio, 2016). Each factor is evaluated considering the balance between the individual and others including reciprocity in relationships (Di Fabio, 2016). Thus, PRM goes beyond the traditional idea of social support, conceiving respect, caring, and connectedness as arising from the balance in and the reciprocity of three specific areas of self-perceptions: (1) The individual for other people; (2) the other people for the individual; (3) the individual for him/herself (Di Fabio, 2016; Di Fabio and Saklofske, 2019). In this way, PRM is configured as a promising resource in strength-based prevention perspectives (Di Fabio and Saklofske, 2021) as well as in a primary prevention approach (Di Fabio and Kenny, 2015).

HCSL (Di Fabio and Peiró, 2018) is a novel higher-order construct. It goes beyond the classic concept of sustainable leadership by placing itself in an integrated positive direction. HCSL incorporates other contemporary aspects of leadership relevant to the functioning and growth of human capital, in line with a psychological and sustainable point of view (Di Fabio and Peiró, 2018). This current construct emphasizes healthy workers and healthy organizations as characterized by success and sustained by the positive circuit of long-term well-being and performance. Its higher-order structure integrates the new concept of sustainability leadership with ethical leadership, mindful leadership, and servant leadership (Di Fabio and Peiró, 2018). Sustainability leadership aspires to create sustainable learning conditions. It develops rather than exhausts human resources, supports workers in their development, and identifies resources, excluding the superfluous in critical aspects of work. Ethical leadership aims to promote fair goals, align actions with ideals, and enforce ethical standards. It empowers organization members, encouraging kindness, compassion, and care for others. Mindful leadership regards comprehension of collaborators, anticipating their requests, and being aware of their limitations and strengths. It recognizes the importance of managing personal emotions, especially in stressful situations. Finally, servant leadership recognizes the moral responsibility of the leader toward collaborators. It supports and assists them in identifying their needs and interests. In this perspective, all the leadership styles enclosed in HCSL involve the awareness of oneself and others, balancing different intrapersonal, interpersonal, and organizational aspects. These aspects of intrapersonal, interpersonal, and organizational awareness are based on an in-depth understanding of oneself and integrating the self in relationships. It is therefore promising to examine the potential of the relationships between PRM and such a current construct as HCSL. Furthermore, it has been established that personality traits, such as those contained in the Big Five personality model, have a significant relationship with a wide variety of human behaviors (Keefer et al., 2018), also showing a relationship with an array of leadership styles (e.g., Judge et al., 2002; Özbağ, 2016; Parr et al., 2016). Thus, it could be relevant to control for the effects of personality traits and verify whether PRM also explains additional variance beyond personality traits in relation to HCSL. It adds to the importance of PRM since it is conceived to be increased *via* specific training (Di Fabio, 2016; Di Fabio and Kenny, 2016a; Di Fabio and Kenny, 2016b), differently from personality traits considered essentially stable (Ferguson, 2010).

According to the delineated framework, the present study aimed at analyzing the associations between PRM and HCSL, taking into account personality traits. Specifically, the following hypotheses were formulated:

> *H1*: A PRM and HCSL will be positively associated.
>
> *H2*: In the relationship between PRM and HCSL, PRM will increase the percentage of explained variance in addition to the variance explained by personality traits.

Materials and methods

Participants

One hundred and ninety-one workers from Central Italy (49.21% males and 50.79% females; mean age = 44.97 years, *SD* = 12.71) participated in the study.

Measures

Big five questionnaire (BFQ; Caprara et al., 1993): a self-report questionnaire composed of 132 items ranging from 1 = "*Absolutely false*" to 5 = "*Absolutely true*". It measures five personality traits: extraversion (example of item: "It's easy for me to talk to people I do not know"); agreeableness (example of item: "I almost always know how to meet the needs of others"); conscientiousness (example of item: "Before submitting an assignment, I spend a lot of time reviewing it");

TABLE 1 Correlations among big five questionnaire, positive relational management scale and human capital sustainability leadership scale.

	M	*SD*	1	2	3	4	5	6	7	8	9
1. Extraversion	74.92	10.24	-								
2. Agreeableness	78.15	10.28	0.12	-							
3. Conscientiousness	83.14	10.77	0.45**	0.20**	-						
4. Emotional stability	69.42	14.07	0.11	0.14	0.26**	-					
5. Openness	81.19	9.87	0.40**	0.48**	0.46**	0.27**	-				
6. Respect	16.19	2.53	0.27**	0.20**	0.25**	0.24**	0.22**	-			
7. Caring	14.53	2.58	0.20**	0.10	0.15*	0.16*	0.07	0.51**	-		
8. Connectedness	17.10	2.80	0.13	0.27**	0.18*	0.10	0.24**	0.50**	0.48**	-	
9. HCSLS	65.93	8.89	0.32**	0.26**	0.27**	0.14*	0.30**	0.44**	0.31**	0.45**	-

$N = 191$. * < 0.05, ** < 0.01. HCSLS, human capital sustainability leadership scale.

emotional stability (example of item: "Usually it does not happen to me to react exaggerated even to strong emotions"); and openness (example of item: "Every novelty fascinates me") (Caprara et al., 1993). Cronbach's alphas reliability coefficients were from 0.75 (Openness) to 0.90 (Emotional stability).

PRM Scale (PRMS; Di Fabio, 2016): 12-item self-report scale ranked between 1 "*Strongly disagree*" and 5 = "*Strongly agree*"; Cronbach's alphas reliability coefficients ranged from 0.80 (Caring) to 0.81 (Connectedness). PRMS comprises three factors: respect, caring and connectedness. Example of item are for the respect (e.g., "I have respect for the value and uniqueness of others"), caring (e.g., "Others often take care of me"), and connectedness (e.g., "I keep a balance in my relationships between family, friends and significant others"; Di Fabio, 2016).

HCSL Scale (HCSLS; Di Fabio and Peiró, 2018): 16-item self-report questionnaire with response format ordered from 1 = "*None*" to 5 = "*Very much*". Examples of items are: "I act by giving an example of doing tasks in an ethically correct manner" (ethical leadership); "I create sustainable learning conditions that I take care to preserve" (sustainable leadership); "I put myself in the shoes of my co-workers when they are doing tasks" (mindful leadership); and "I encourage my collaborators when I realize that they encounter difficulties" (servant leadership; Di Fabio and Peiró, 2018). Cronbach's alpha 0.94.

Procedure

The administration of the self-rating scales was conducted collectively by specialized personnel, asking for written and informed consent according to privacy Italian laws (DL-196/2003; EU 2016/679). The sequence of the instruments' administration was counterweighted to account the presentation order effects.

Data analysis

Descriptive statistics, Pearson's *r* correlations, and the hierarchical regression were conducted through SPSS software.

Results

Table 1 shows Pearson's *r* correlations among BFQ, PRMS and HCSLS.

TABLE 2 Hierarchical regression: contribution of personality traits (big five questionnaire) and positive relational management scale in relation to human capital sustainability leadership scale.

	HCSLS β
Step 1	
Extraversion	0.22**
Agreeableness	0.18*
Conscientiousness	0.10
Emotional stability	0.05
Openness	0.06
Step 2	
Extraversion	0.17*
Agreeableness	0.09
Conscientiousness	0.06
Emotional stability	0.01
Extraversion	0.04
Respect	0.21*
Care	0.01
Connectedness	0.28**
R^2 step 1	0.17***
ΔR^2 step 2	0.16***
R^2 total	0.33***

$N = 191$; * < 0.05, ** < 0.01. ***$p < 0.001$. HCSLS, human capital sustainability leadership scale.

In Table 2 the findings of hierarchical regression conducted using the HCSL as dependent variable are reported. At step 1, Personality traits explained the 17% of the variance; at step 2, the PRMS dimensions increased 16% of the variance. Overall, the model explained the 33% of the variance.

Discussion

The current research sought to analyze the relationships between PRM and HCSL, taking into account personality traits. A statistically significant and positive association was observed between PRM and HCSL (*H1*), also after controlling for personality traits (*H2*), confirming

the hypotheses of this research. The dimensions of PRM that particularly emerged related to HCSL are Connectedness followed by Respect. The findings highlighted that the aspects of PRM of workers relative to connectedness and reciprocity with others and respect (for others, of others for me, for myself; Di Fabio, 2016) were related to a leadership style centered on healthy people as resilient and flourishing workers (Di Fabio and Peiró, 2018). These results emphasize positive relationships characterized by connectedness and the positive constellation of respect towards others, of others towards me and my respect towards myself at the workplace are associated with a higher HCSL style. Overall, these results underlined the value of PRM in relation to HCSL in organizations (Di Fabio and Peiró, 2018). Furthermore, since Connectedness and Respect emerged as PRM dimensions mainly associated with HCSL, these two dimensions could be assessed with attention in research and intervention aimed at studying and fostering PRM to promote HCSL. It could also be relevant for the accountability framework, which encourages researchers to use evidence-based methodologies to ensure a balance in cost-effectiveness (Whiston, 1996, 2001). Tailored strategy focused on specific dimensions could be a promising strategy for decreasing the time and costs of research and intervention (Whiston, 1996, 2001).

Limits and conclusion

This study has some limits. Participants were workers of Central Italy not representative of all Italian workers. In future research, workers of different Italian regions should be involved to examine the relationships between the constructs included in this study. Furthermore, it could be worthy to replicate this research in international contexts also cross-culturally. A further limit is relative to the cross-sectional design of the research that calls for future longitudinal research. Future studies could expand the knowledge concerning the associations between PRM and HCSL, for example, investigating the moderating or the mediating role of PRM on the relationship between personality traits and HCSL, with a particular focus on the Respect and Connectedness dimensions.

Even though these limits and the necessity of additional research, these results expand the literature highlighting the role of PRM in contributing to HCSL. If the findings of this study are confirmed, new opportunities for interventions will emerge regarding HCSL. Preventive perspectives underline the relevance of managing positive relationships (Di Fabio, 2016) to enhance both relationality (Blustein, 2011) and respectivity (Maree, 2012) for flourishing of people in work and life contexts (Di Fabio, 2014). Furthermore, in strengths-based prevention (Di Fabio and Saklofske, 2021) as well as in primary prevention perspectives (Hage et al., 2007), PRM could have a preventive value in relation to a leadership style that promote human resources sustainability and sustainable development (Di Fabio and Peiró, 2018).

Both PRM and HCSL constitute precious resources for building well-being at the workplace (Cartwright and Cooper, 2014; Johnson et al., 2018), and crucial assets to enable flourishing of healthy workers, healthy business, and healthy organizations (Di Fabio et al., 2020).

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 the Ethics Committee of the Integrated Psychodynamic Psychotherapy Institute (IPPI). The patients/participants provided their written informed consent to participate in this study.

Author contributions

ADF conceptualized the paper, supervised and tutored AB. AB realized the investigation and run statistical analyses. LP and AS wrote the first draft of the paper. ADF, AG, and AS reviewed, edited, and wrote the final draft of the paper. All authors contributed to the article and approved the submitted version.

Conflict of interest

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

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References

Blustein, D. L. (2006). *The Psychology of Working: A New Perspective for Counseling, Career Development, and Public Policy*. Mahwah, NJ: Lawrence Erlbaum Associates.

Blustein, D. L. (2011). A relational theory of working. *J. Vocat. Behav.* 79, 1–17. doi: 10.1016/j.jvb.2010.10.004

Blustein, D. L. (2013). "The psychology of working: A new perspective for a new era," in *The Oxford Handbook of the Psychology of Working*. ed. D. L. Blustein (New York, NY: Oxford University Press), 3–18.

Blustein, D. L., Kenny, M. E., Di Fabio, A., and Guichard, J. (2019). Expanding the impact of the psychology of working: engaging psychology in the struggle for decent work and human rights. *J. Career Assess.* 27, 3–28. doi: 10.1177/1069072718774002

Blustein, D. L., Prezioso, M. S., and Schultheiss, D. P. (1995). Attachment theory and career development: current status and future directions. *Couns. Psychol.* 23, 416–432. doi: 10.1177/0011000095233002

Caprara, G. V., Barbaranelli, C., and Borgogni, L. (1993). *BFQ: Big Five Questionnaire. 2nd Edn*. Florence, Italy: Giunti O.S.

Cartwright, S., and Cooper, C. L. (2014). "Towards organizational health: stress, positive organizational behavior, and employee well-being" in *Bridging Occupational, Organizational and Public Health: A Transdisciplinary Approach*. eds. G. F. Bauer and O. Hämmig (Dordrecht, The Netherlands: Springer Science+Business Media), 29–42.

Costa, P. T., and McCrae, R. R. (1992). *NEO PI-R Professional Manual*. Odessa, FL: Psychological Assessment Resources.

Di Fabio, A. (2014). "The new purposeful identitarian awareness for the twenty-first century: valorize themselves in the life construction from youth to adulthood and late adulthood," in *The Construction of the Identity in 21st Century: A Festschrift for Jean Guichard*. eds. A. D. Fabio and J.-L. Bernaud (Hauppauge, NY: Nova Publisher). 157.

Di Fabio, A. (2016). Positive relational management for healthy organizations: psychometric properties of a new scale for prevention for workers. *Front. Psychol.* 8:1938. doi: 10.3389/fpsyg.2017.01938

Di Fabio, A. (2017a). Positive healthy organizations: promoting well-being, meaningfulness, and sustainability in organizations. *Front. Psychol.* 8:1938. doi: 10.3389/fpsyg.2017.01938

Di Fabio, A. (2017b). The psychology of sustainability and sustainable development for well-being in organizations. *Front. Psychol.* 8:1534. doi: 10.3389/fpsyg.2017.01534

Di Fabio, A., and Blustein, D. L. (2016). Editorial: from meaning of working to meaningful lives: the challenges of expanding decent work. *Front. Psychol.* 7:1119. doi: 10.3389/fpsyg.2016.01119

Di Fabio, A., Cheung, F., and Peiró, J.-M. (2020). Editorial special issue personality and individual differences and healthy organizations. *Pers. Individ. Differ.* 166:110196. doi: 10.1016/j.paid.2020.110196

Di Fabio, A., and Gori, A. (2016a). Assessing workplace relational civility (WRC) with a new multidimensional "mirror" measure. *Front. Psychol.* 7:890. doi: 10.3389/fpsyg.2016.00890

Di Fabio, A., and Gori, A. (2016b). Developing a new instrument for assessing acceptance of change. *Front. Psychol.* 7:802. doi: 10.3389/fpsyg.2016.00802

Di Fabio, A., and Kenny, M. E. (2015). The contributions of emotional intelligence and social support for adaptive career progress among Italian youth. *J. Career Dev.* 42, 48–59. doi: 10.1177/0894845314533420

Di Fabio, A., and Kenny, M. E. (2016a). From decent work to decent lives: positive self and relational management (PS&RM) in the twenty-first century. *Front. Psychol.* 7:361. doi: 10.3389/fpsyg.2016.00361

Di Fabio, A., and Kenny, M. E. (2016b). Promoting well-being: the contribution of emotional intelligence. *Front. Psychol.* 7:1182. doi: 10.3389/fpsyg.2016.01182

Di Fabio, A., and Palazzeschi, L. (2012). Organizational justice: personality traits or emotional intelligence? An empirical study in an Italian hospital context. *J. Employ. Couns.* 49, 31–42. doi: 10.1002/j.2161-1920.2012.00004.x

Di Fabio, A., Palazzeschi, L., and Bucci, O. (2017). Gratitude in organizations: a contribution for healthy organizational contexts. *Front. Psychol.* 8:2025. doi: 10.3389/fpsyg.2017.02025

Di Fabio, A., and Peiró, J. M. (2018). Human capital sustainability leadership to promote sustainable development and healthy organizations: a new scale. *Sustainability* 10:2413. doi: 10.3390/su10072413

Di Fabio, A., and Rosen, M. A. (2018). Opening the black box of psychological processes in the science of sustainable development: a new frontier. *Eur. J. Sustain. Dev.* 2:47. doi: 10.20897/ejosdr/3933

Di Fabio, A., and Saklofske, D. (2019). Positive relational Management for Sustainable Development: beyond personality traits—the contribution of emotional intelligence. *Sustainability* 11:330. doi: 10.3390/su11020330

Di Fabio, A., and Saklofske, D. H. (2021). The relationship of compassion and self-compassion with personality and emotional intelligence. *Pers. Individ. Differ.* 169:110109. doi: 10.1016/j.paid.2020.110109

Di Fabio, A., Saklofske, D. H., Gori, A., and Svicher, A. (2022). Perfectionism: a network analysis of relationships between the big three perfectionism dimensions and the big five personality traits. *Pers. Individ. Differ.* 199:111839. doi: 10.1016/j.paid.2022.111839

Di Fabio, A., Svicher, A., and Gori, A. (2021). Occupational fatigue: relationship with personality traits and decent work. *Front. Psychol.* 12:742809. doi: 10.3389/fpsyg.2021.742809

Dincer, I., and Rosen, M. A. (2013). *Exergy Energy, Environment and Sustainable Development. 2nd Edn.* Oxford, UK: Elsevier Science Publishers.

Duffy, R. D., Blustein, D. L., Diemer, M. A., and Autin, K. L. (2016). The psychology of working theory. *J. Couns. Psychol.* 63, 127–148. doi: 10.1037/cou0000140

Duradoni, M., and Di Fabio, A. (2019). Intrapreneurial self-capital and sustainable innovative behavior within organizations. *Sustainability* 11:322. doi: 10.3390/su11020322

Ferguson, C. J. (2010). A meta-analysis of normal and disordered personality across the life span. *J. Pers. Soc. Psychol.* 98, 659–667. doi: 10.1037/a0018770

Gori, A., Topino, E., Svicher, A., Schuldberg, D., and Di Fabio, A. (2022). Insight orientation scale: a promising tool for organizational outcomes–a psychometric analysis using item response theory. *Front. Psychol.* 13:987931. doi: 10.3389/fpsyg.2022.987931

Hage, S. M., Romano, J. L., Conyne, R. K., Kenny, M., Matthews, C., Schwartz, J. P., et al. (2007). Best practice guidelines on prevention practice, research, training, and social advocacy for psychologists. *Couns. Psychol.* 35, 493–566. doi: 10.1177/0011000006291411

Johnson, S., Robertson, I., and Cooper, C. L. (2018). *Wellbeing: Productivity and Happiness at Work. 2nd Edn.* Cham, Switzerland: Palgrave Macmillan.

Judge, T. A., Bono, J. E., Ilies, R., and Gerhardt, M. W. (2002). Personality and leadership: a qualitative and quantitative review. *J. Appl. Psychol.* 87, 765–780. doi: 10.1037/0021-9010.87.4.765

Keefer, K. V., Parker, J. D. A., and Saklofske, D. H. (2018). "Emotional intelligence, stress, and health: when the going gets tough, the tough turn to emotions" in *An Introduction to Emotional Intelligence*. eds. L. D. Poole and P. Qualter (Hoboken, NJ, USA: Wiley, The British Psychological Society), 161–183.

Kenny, M. E., Blustein, D. L., Chaves, A., Grossman, J. M., and Gallagher, L. A. (2003). The role of perceived barriers and relational support in the educational and vocational lives of urban high school students. *J. Couns. Psychol.* 50, 142–155. doi: 10.1037/0022-0167.50.2.142

Maree, J. G. (2012). Editorial. Promoting children's rights: rekindling respectively. *S. Afr. J. Psychol.* 42, 295–300. doi: 10.1177/008124631204200301

Özbağ, G. K. (2016). The role of personality in leadership: five factor personality traits and ethical leadership. *Procedia. Soc. Behav. Sci.* 235, 235–242. doi: 10.1016/j.sbspro.2016.11.019

Palazzeschi, L., Bucci, O., and Di Fabio, A. (2018). Re-thinking innovation in organizations in the industry 4.0 scenario: new challenges in a primary prevention perspective. *Front. Psychol.* 9:30. doi: 10.3389/fpsyg.2018.00030

Parr, A. D., Lanza, S. T., and Bernthal, P. (2016). Personality profiles of effective leadership performance in assessment centers. *Hum. Perform.* 29, 143–157. doi: 10.1080/08959285.2016.1157596

Peiró, J. M., Ayala, Y., Tordera, N., Lorente, L., and Rodríguez, I. (2014). Bienestar sostenible en el trabajo: revisión y reformulación. *Pap. Psicól.* 35, 5–14.

Rosen, M. A. (2009). Energy sustainability: a pragmatic approach and illustrations. *Sustainability* 1, 55–80. doi: 10.3390/su1010055

Svicher, A., Di Fabio, A., and Gori, A. (2022a). Decent work in Italy: a network analysis. *Aust. J. Career Dev.* 31, 42–56. doi: 10.1177/10384162221089462

Svicher, A., Gori, A., and Di Fabio, A. (2022b). Work as meaning inventory: a network analysis in Italian workers and students. *Aust. J. Career Dev.* 31, 130–148. doi: 10.1177/10384162221110361

Whiston, S. C. (1996). Accountability through action research: research methods for practitioners. *J. Couns. Dev.* 74, 616–623. doi: 10.1002/j.1556-6676.1996.tb02301.x

Whiston, S. C. (2001). Selecting career outcome assessments: an organizational scheme. *J. Career Assess.* 9, 215–228. doi: 10.1177/106907270100900301

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Psychometric properties of the mental health continuum-short form in Iranian adolescents

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Introduction: Psychological tests are necessary to assess the mental state of individuals. Mental health is one of the important psychological indicators and is increasingly considered as having various aspects of well-being. The Mental Health Continuum-Short Form (MHC-SF) is a 14-item instrument that assesses mental health, focusing on emotional, psychological, and social well-being. The present study, the psychometric properties of the Persian version of the MHC-SF were examined in relation to its factor structure, internal consistency, construct validity, and gender measurement invariance among adolescents.

Methods: The population of this study was Iranian adolescents between 11-and 18-year-old who were enrolled in the seventh to twelfth grades. A convenience sample of 822 Adolescents from four large cities in the Iran (Tehran, Zanjan, Hamedan and Ghazvin) participated in the present study. Questionnaires were completed online. Statistical analyses to evaluate the factor structure, internal consistency, construct validity, gender and age factorial invariance were performed in SPSS and LISREL.

Results: According to the results of confirmatory factor analysis, the MHC-SF is composed of three factors: emotional, psychological, and social well-being. Reliability was confirmed by Cronbach's alpha method and composite reliability (>0.7). Measurement invariance were confirmed among girls and boys. Convergent and divergent validity were also evaluated and confirmed by correlating the test score with similar and different tests.

Conclusion: This study confirmed the psychometric properties of MHC-SF in the Iranian adolescent community. This instrument can be used in psychological research and diagnostic evaluations.

KEYWORDS

mental health, mental health continuum-short form, psychometric, adolescents, Iran

Introduction

Adolescence is a critical period for increasing vulnerability and the onset of mental disorder (World Health Organization, 2014; Heizomi et al., 2020). Mental health problems during adolescence impose psychological, social and economic challenges on any society (Kieling et al., 2011; Sharifi et al., 2016; Heizomi et al., 2020). Epidemiological studies have shown the prevalence of adolescent mental disorder from 10 to 20% worldwide (Kieling et al., 2011). About 15% of Iran's population is between 10 and 20 years old and adolescents (Statistical Center of Iran, 2016). Based on epistemological data in Iran, behavioral and mental health problems are common in this group (Mohammadi et al., 2014; Sharifi et al., 2015; Rogoza et al., 2018). In national epidemiological survey

in of Iranian Children and adolescents, 6,209 out of 30,532 (22.31%) were diagnosed with at least one psychiatric disorder. The anxiety disorders (14.13%) and behavioral disorders (8.3%) had the highest prevalence, while eating disorders (0.13%) and psychotic symptoms (0.26%) had the lowest. In other words, about one fifth of Iranian children and adolescents suffer from at least one psychiatric disorder (Mohammadi et al., 2019). Regarding anxiety and depression, emotion control skills develop considerably over adolescence. Adolescence is additionally a threat period for the modern onset of anxiety and depressive disorders, psychopathologies which have long been related to disturbances in the control of positive and negative emotion (Young et al., 2019). Emotion control is characterized as the capacity to oversee one's passionate reactions. This incorporates techniques to extend, keep up, or decrease the intensity, length, and direction of positive and negative emotion (Parrott, 1993; Gross, 2002; Koole, 2010). Learning to direct emotion may be a critical socio-emotional ability that permits adaptability in emotionally-evocative circumstances. There are precise formative shifts in how we oversee enthusiastic reactions. In early childhood, feelings are communicated and external support is sought (Kopp, 1989). In adolescence, there is ordinarily a diminished dependence on parental support and constrained adequacy of adaptive inside emotion control (Zimmermann and Iwanski, 2014). Disturbances to emotion control capacities in adulthood are central to hypotheses of how will manifest anxiety and depressive disorders and also be maintained (Hofmann et al., 2012). These hypotheses recommend that decreased capacities to downregulate increased negative influence are typical to both anxiety and depression, though the diminished ability to direct positive affect may be more particular to depressive disorders (Werner-Seidler et al., 2013). Adolescence may be a period of increased hazard for the onset of anxiety-clutters and depression (Beesdo et al., 2010; Lee et al., 2014). It is well-established that stressful life occasions and childhood difficulties are significant risk factors for future psychopathology (Kessler et al., 2010).

The relationship between mental health and mental disorder has evolved in recent decades, and this has influenced the conceptualization of mental health. For example, the World Health Organization defined mental health as being free from mental illness (Snyder et al., 2002; Fen et al., 2013). However, focusing solely on the prevention and treatment of mental disorder was not successful in reducing the prevalence of mental disorder (Insel and Scolnick, 2006). In particular, Weisz et al. (2017) showed that in the last 50 years, psychological interventions in children and adolescents have not led to much improvement. On the other hand, the pathological view of mental health did not help to distinguish adolescents with educational and behavioral problems (Antaramian et al., 2010).

With the development of positive psychology, a new approach to mental health was formed. In the latest definition of the World Health Organization (World Health Organization, 2004) mental health is defined as "A state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community." These approaches emphasize the role of positive functioning, worthwhile goals, meaningful activity and optimistic growth in mental well-being. Thus, elements of positive mental health and symptoms of mental disorder can coexist. In this view, the strengths and weaknesses of the individual are seen together and must be combined to fully assess the mental state.

Various models have been proposed for conceptualizing and evaluating mental health. In Keyes's theory (Keyes, 2002), human beings are embedded in social structures, face various social challenges, and have numerous interpersonal interactions, thus addressing the social aspect of mental health. Keyes (2002, 2007) developed two distinct but related continuum model, instead of a single continuum with mental well-being and illness at both ends. This mental health continuum distinguishes three levels of positive mental health: flourishing, moderate, and languishing mental health (Keyes et al., 2012). In the theoretical model of MHC, it is separated into three factors "emotional, psychological and social." Emotional well-being includes of positive emotions and satisfaction life (Diener et al., 1999). Psychological well-being comprises aspects of individuals' psychological functioning (e.g., autonomy and a sense of personal growth; Ryff, 1989). Social well-being focuses on individuals' evaluations of their social lives, capturing individuals' appraisals of their own circumstances and functioning in society (Keyes, 1998, 2002). Keyes (2002) has argued that it takes a blend of emotional, psychological, and social well-being to be considered mentally healthy. He distinguishes flourishing as a state where individuals combine a high level of subjective well-being with an optimal level of psychological and social functioning. Similarly, languishing refers to a state in which low levels of subjective well-being are combined with low levels of psychological and social well-being. Those who are not declining and flourishing have average mental health. This definition of low levels of subjective well-being parallels the definition of depression in the DSM-IV, which includes both feelings of anhedonia (feeling sad or loss of interest and pleasure) and reported problems in functioning (such as problems in appetite, sleeping, or fatigue) (Keyes, 2002). People with flourishing mental health have enjoyable and positive performance (Keyes, 2005). In contrast, people with languishing mental health experience low pleasure. Epidemiological studies have shown that MHC-SF is associated with superior physical, mental, and psychosocial functions.

Most instruments designed to measure adolescent mental well-being either have many questions or measure limited dimensions of mental health (Luijten et al., 2019). Acceptance of MHC-SF psychometric properties in many countries supports its desirability, validity and reliability. The 14 items continuum-short form of mentalhealth (MHC-SF) (Singh et al., 2015) is a short questionnaire that corresponds to the 40 item Continuum mental health form (Donnelly et al., 2019). Psychometric properties of the MHC-SF were confirmed in adolescents and adults of different cultures, including Argentina (Perugini et al., 2017), Canada (Doré et al., 2017), China (Guo et al., 2015), Egypt (Salama-Younes, 2011), India (Singh et al., 2015), Ireland (Donnelly et al., 2019), Italy (Petrillo et al., 2015), Korea (Lim, 2014), Poland (Karaś et al., 2014), South Africa (Keyes et al., 2008), United States (Keyes, 2006b; Keyes et al., 2012), Dutch (Luijten et al., 2019). In Iran, too, Joshanloo (2016) reported the psychometric properties of this tool well. But his research sample was university students.

As mentioned, adolescents are a special group and the structure obtained from adults about them may not be valid. Given that the field of planning and exercise is increasingly focused on mental health among adolescents, an appropriate instrument for this age group is needed to considering the variance in well-being. The aim of this study was to adapt MHC-SF to a sample of adolescents in Iranian society. For this purpose, the factor structure and psychometric properties have been evaluated. Most previous research has confirmed the three-factor structure for MHC-SF (Guo et al., 2015; Doré et al., 2017; Perugini et al., 2017). In order to investigate the psychometric properties of MHC-SF, first, its reliability is evaluated based on internal consistency and composite reliability, second, determining the factor structure by assuming three

underlying factors, and third, evaluating construct validity of the MHC-SF-A, correlating the PANAS-C, and Kidscreen-2 and DASS-21.

Material and method

Participants

The population of this study was Iranian adolescents between 11 and 18 years old who were enrolled in the seventh to twelfth grades. A convenience sample of 822 adolescents from four large cities in the Iran (Tehran, Zanjan, Hamedan and Ghazvin) participated in the present study. They were relatively proportional distributed by sex: 430 girls (52%) and 392 boys (48%). The mean age was 16.33 years old ($SD = 8.80$). The highest percentage of the participants (38.6%; $n = 317$) lived in Tehran province, 20% ($n = 165$) lived in Zanjan province, 22% ($n = 179$) lived in Hamedan province 18.7% ($n = 154$) lived in Ghazvin province and only 7 cases did not report their residence. Concerning their socioeconomic status, the majority (68.1%, $n = 560$) described itself as belonging to the middle class, 19.9% ($n = 164$) to middle-low or lower class, 9.2% ($n = 76$) to high or middle-high class, and 2.6% ($n = 22$) did not report their class. In the Iranian educational system, the first and second secondary education are included from the seventh to the 12 grades. Most of the participants (58%, n = 479) were enrolled in the second secondary, compared to 42% (n = 345) who were enrolled in the first secondary education. In terms of educational grade, the sample consisted of 95 7th graders (11.5%), 115 8th graders (13.9%), 135 9th graders (36.5%), 164 10th graders (36.5%), 195 11th graders (36.5%), and 120 12th graders (36.5%).

Procedure

The executive process of this research has been approved by the Ethics Committee of Kermanshah University of Medical Sciences under No. IR.KUMS.REC.1400.608 all procedures were carried out an adequate understanding and each participant provided their informed consent prior to the study. Data were collected through non-random and voluntary sampling. Iranian adolescents were asked to complete online questionnaires. Questionnaires were provided for online implementation and administered from November 28th 2020 to February 16th 2021. Before completing the questionnaires, the participants were explained the purposes and significance of research and their informed consent was obtained. For subjects under 16 years of age, the questionnaire link was first provided to their parents and after their consent, the questionnaire link was provided to their children.

MHC-SF-A

The original 14-item Mental Health Continuum–Short Form (MHC-SF) (Keyes et al., 2008) is a self-report questionnaire, measuring three basic subjective well-being domains: emotional (3 items), psychological (6 items) and social (5 items) of well-being. Respondents rated the frequency of every feeling in the past month on a 6-point Likert scale. Respondents thought about their past month and rated the frequency of each feeling on a 6-point Likert-type scale, from never (0) to every day (5). The Iranian version of this questionnaire has already been used and validate by Rafiey et al. (2017) in the adult population. The original English MHC-SF for adolescent is just like the adult version, with only one helpful change to better fit the adolescent population (Keyes et al., 2008). Specially, examples of the community in the item "How often did you feel that you belonged to a community?" which in the adult version was "(like a social group, your neighborhood, or your city)" were given in the adolescent version as "(like a group of friends, at school, or in the neighborhood)."

PANAS-C

The positive affect (PA) dimension of the 10-item PANAS-C (Ebesutani et al., 2012) was selected to evaluate emotional well-being, as referred to the degree to which people feel are vitality and enthusiastic. The PA dimension was evaluated five adjective by five items: happy, lively, happy, energetic, and proud. The items have a 5-point Likert response format, with answers ranging from 1 („very little) to 5 („a lot'). The sum of the item scores gives the total health score. The PA dimension has been shown to measure PA markers well among 6–18-year-olds. Ebesutani et al. (2012) showed that PANAS-C is valid and reliable for the age group of 18–18 years. Lotfi et al. (2020) reported the psychometric properties of this questionnaire very well in Iran. In the present study, the Cronbach's alpha of the PANAS-C was 0.76.

Kidscreen-27

Kidscreen-27 (Ravens-Sieberer et al., 2008) is a brief screening measure to evaluate the behavioral and emotional problems of children and adolescents by 27 items measuring five scales, physical well-being, psychological well-being, autonomy and parents, peers and social support, and school environment. Items are scored on a 5-point Likert scale. The higher the total score indicates greater quality of life. Nik-Azin et al. (2013) reported the psychometric properties of this questionnaire in Iran, suitable for the age group of 11 to 19 years. The results of this study supported the five-factor structure of the original version. In the present study, the Cronbach's alpha of the Kidscreen-27 was 0.73.

DASS-21

The DASS-21 (Antony et al., 1998) is a short form of DASS-42, well-established instrument for measuring depression, anxiety, and stress with good reliability and validity reported in different cultural context (Oei et al., 2013). DASS-21 is a set of three self-report 7-item scales for assessing negative mental states in anxiety, depression, and stress. All 21 items are scored on a 4-point Likert scale from 0) did not apply to me at all) to 3 (applied to me very much, or most of the time). Asghari et al. (2008), examining the psychometric properties of this questionnaire in Iran, reported it as valid and reliable. A high score indicates psychological distress on each scale. In the present study, the Cronbach's alpha of the DASS-21 was 0.75. In the section, only the "anxiety" and "depression" dimensions of that scale were used for the purposes of this study.

Data analysis method

After data collection and data screening in the first stage, and after discarding 21 questionnaires with missing or distorted data, the main analyzes were performed with SPSS-26 and Lisrel-10.2 software.

Face validity

The purpose of face validity is to ensure that respondents understand the items. In this study, face validity was evaluated quantitatively and qualitatively. For qualitative face validity, the questionnaire was provided to 15 participants of the target population to determine the degree of appropriateness, the level of difficulty, and the ambiguity of the items. For quantitative face validity, 30 adolescents determined the importance of the items in relation to the goal of the study. The impact score of each item was measured based on the formula: average × ratio of individuals who have chosen the most important and important option divided by the total number of individuals. The items with an impact score of more than 1.5 were accepted (Asghari et al., 2008).

Content validity

Content validity was evaluated both quantitatively and qualitatively. To evaluate the quantitative content validity, an expert panel of 10 people was formed including 8 children and adolescent psychologists and 2 psychometricians and they were asked to comment on the necessity of each item. Based on this, the value of content validity index (CVI) and Content Validity Ratio (CVR) was calculated. As a criterion, the acceptable value for CVI of each item is 0.7 and more. The expert panel was also asked to rate the items of the questionnaire in terms of clarity of the items. To test qualitative content validity, the experts provided their comments on grammar, editing points, use of appropriate words, sentence structure, etc. for each ite.

Factorial validity

After confirming the face validity and content of the items, the factorial validity was assessed using confirmatory factor analysis. LISREL10.2 was used to evaluate the factor structure. The method of estimating the weighted least squares with data from polychoric matrix and asymptotic covariance matrix was used in data analysis. The least squares method was preferred because the Likert response options were five-choice and the polychoric matrix had to be calculated instead of the Pearson correlation (Keyes, 1998).

In this phase, 801 adolescents participated. The model was evaluated using fit indices of chi-square, chi-square to the degree of freedom ratio (X^2/df), standard deviation estimation error (Root Mean Square Error of Approximation), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), Parsimony goodness of fit index (PGFI), Normed Fit Index (NFI) and comparative fit index (CFI) were used. *p*-value more than.05, X^2/df less than three and RMSEA more than 0.08, PGFI more than 0.5, and other indices more than 0.9 were accepted (Schreiber et al., 2006).

Measurement invariance

Multigroup confirmatory factor analysis was performed to evaluate the invariance of the best-fitting model based on gender. Four types of invariance were investigated in this study: configural invariance (Is the configuration of the model the same across groups?), metric/weak invariance (Are factor loadings the same across groups?), scalar/strong invariance (Are the intercepts the same across groups?), and strict invariance (Are the residual variances the same across groups?) across gender (boys vs. girls). Configural invariance was confirmed if RSMEA and SRMR were < 0.08 and CFA was >0.95 (Cheung and Rensvold, 2002). A relative change of ≤0.010 in CFI, supplemented by a relative change of ≤0.015 in RMSEA or ≤ 0.030 in SRMR, indicated that the null hypothesis of invariance should not be rejected (Chen, 2007).

Construct validity

To evaluate the construct validity, the relationship between the score obtained from MHC-SF-A and several other measures was examined. According to Keyes (2007) conceptualization, MHC-SF-A is expected to be negatively related to anxiety and depression (convergent validity) and also has a positive relationship with Kidscreen-27 positive affect tests (divergent validity). The Pearson correlation coefficient was used to determine the direction and intensity of the relationship between the measures.

Reliability

The reliability of the MHC-SF was determined through internal consistency and composite reliability. Value greater than 0.7 was considered acceptable (Keyes, 2006a).

Results

The results of the analysis are reported separately for different areas of psychometrics.

Table 1 shows the descriptive statistics (means, standard deviations, skewness, and kurtosis), Cronbach alphas and composite reliabilities for latent MHC-SF-A subscales.

Face validity

In order to achieve qualitative face validity, the opinion of the experts of the specialized panel was applied. Given the acceptable impact score value, the quantitative face validity of items was also confirmed. However, "That you had something important to contribute to society" received the maximum score (IS = 4.1), whereas, the minimum score was attributed to "That you liked most parts of your personality" (Is = 2.16).

Content validity

The CVR and CVI of the questionnaire were evaluated according to the opinions of the expert's panel. The values of both indicators for all questions were between 0.8 and 0.98. Therefore, the content validity of the MHC-SF was confirmed.

Factorial validity

Confirmatory factor analysis was performed by comparing four models of one-factor, two-factor, three-factor first-order and three-factor second-order. According to the information in Table 2, the first-order three-factor model has the best fit. Table 3 reports the standard estimates and the t-value based on the best fit of the factor model.

TABLE 1 Descriptive statistics for MHC-SF dimensions.

Dimension	M	SD	Skewness	Kurtosis
Emotional	10.31	3.17	0.38	0.70
Social	14.82	3.94	0.74	0.67
Psychological	18.13	4.26	0.43	0.69
MHC-SF Total	43.27	12.48	0.51	0.33

TABLE 2 Results of the confirmatory factor analyses.

Model	X^2	df	IFI	CFI	NFI	RMSEA	90% CI RMSEA
Single factor	727.22	77	0.823	0.818	0.813	0.131	0.126–0.136
Two factor	498.09	75	0.872	0.868	0.867	0.111	0.106–0.116
Three factor	222.35	73	0.938	0.943	0.941	0.061	0.055–0.066
Second order (three factor)	315.74	68	0.910	0.901	0.903	0.082	0.074–0.087

χ^2: Chi Squared test, df: degrees of freedom, IFI: Incremental Fit Index, CFI: comparative fit index, NFI: Normed-of-Fit Index, RMSEA: root-mean-square error of approximation, CI: confidence interval. Criteria for interpreting model fit are: RSMEA < 0.08, IFI, CFI and NFI > 0.90.

Measurement invariance

Table 4 shows the values for comparing models and measurement variability.

According to the appropriate fit of the three-factor model between girls and boys, the configural invariance is confirmed. Changes of X^2, CFI, and RMSEA, when the metric/weak invariance model is compared with the configural invariance model, were within recommended values (ΔCFI = 0.002, ΔX^2 = 13.52 with p = 0.26, ΔRMSEA = 0.001). This indicates that the metric of factor scores was invariant across gender. This confirms the items used to estimate the factor loadings have the same meaning for males and females. The second more restrictive model, which constrained the factor loadings and item intercept to create the scalar/strong invariance model, resulted in the demonstration of strong invariance (ΔCFI = 0.000, ΔX^2 = 22.86 with p = 0.087, ΔRMSEA = 0.002). This indicates that both factor loadings and item intercept are invariant between genders. The last more restrictive model, which constrained the factor loadings, item intercept, and residual variances, to produce the strict invariance model was then inspected. The changes of the fit indices were within the acceptable values (ΔCFI = 0.004, ΔX^2 = 40.10 with p = 0.082, ΔRMSEA = 0.001).

Construct validity

To evaluate the construct validity, the relationship between the score obtained from MHC-SF-A and several other measures was examined. According to Keyes (2007) conceptualization, MHC-SF-A is expected to be negatively related to anxiety and depression (divergent validity), also has a positive relationship with Kidscreen-27 positive affect tests (convergent validity). The results of Pearson correlation coefficient for convergent and divergent validity are reported in Table 5. This table also shows the relationship between MHC-SF-A subscales to evaluate the internal homogeneity of the test. Based on these results, there is both convergent validity, divergent validity and internal validity between MHC-SF-A subscales.

Reliability

The results reported in Table 6 support the reliability of the scales in both Cronbach's alpha methods and the composite reliability (>0.70(that indicates that the MHC-SF is a reliable measure, therefore it can be accepted.

Discussion

The aim of this study was to examine at the structure and psychometric features of data collected for teenagers using the Mental Health Continuum-Short Form version (Keyes et al., 2008) in Iranian adolescences, its internal consistency and reliability, its invariance across gender, and plausibility of the two continua model proposing that mental health and illness are distinct yet related constructs. The Mental Health Continuum, or MHC, provides a clinical approach toward the ongoing evaluation and categorical identification of positive mental health states (Keyes, 2007; Keyes et al., 2008). The 14-item short form of the MHC scale is one of the most extensively used measures to assess well-being around the world (Perugini et al., 2017). As a result, the primary goal of this research would have been to verify the MHC–SF in an Iranian adolescent population. The present results confirm that the MHC-SF is a valid and reliable tool that can be taken advantage of evaluating the health of Iranian adolescents.

The results of study prove that the multidimensional structure of well-being (emotional, social and psychological). The three-factor model showed an acceptable goodness-of-fit index and was relatively superior to the one-and two-factor models. These findings are consistent with a growing body of research suggesting that the MHCSF measures three specific factors that correspond to major components of overall well-being and subscales of emotional, social, and psychological well-being (Karaś et al., 2014; Petrillo et al., 2015; Joshanloo, 2016; Echeverría Errázuriz et al., 2017; Rogoza et al., 2018; Longo et al., 2020).

MHCSF emotional and psychometric scales in this population displayed high internal consistency and reliability, as assessed by Cronbach's alpha. The internal consistency and reliability coefficients of the social well-being subscale were acceptable, but low compared to the other subscales. Similar results have been detected in preceding studies (Keyes et al., 2008; Lamers et al., 2011; Karaś et al., 2014; Petrillo et al., 2015). All Cronbach alphas were superior to those seen in studies in South Africa, the Netherlands and Italy (Keyes et al., 2008; Lamers et al., 2011; Karaś et al., 2014).

Confirmatory Factor Analysis (CFA) was calculated to determine the factor structure of MHC-SF. A second-order CFA was performed to test whether these three factors reveal the same dimension. The CFA provides a fairly good level of support for the MHC-SF tripartite structure (Joshanloo et al., 2013; Karaś et al., 2014). A unique cross-culture study of MHC-SF factor structure is Joshanloo et al. (2013) study using CFA, displaying that the three-dimensional model of the MHC-SF corresponded to the data well in Iran, South Africa, and the Netherlands. The overall Iranian MHC-SF and the three sub-dimensions were more internally consistent than other studies. In addition, our results confirmed strong invariance of the three MHC-SF elements by gender. These results suggest that MHC-SF is similarly measured in males and females using a three-factor model, allowing comparisons between genders.

The convergent validity of the MHCSF was good in the present study, implying that the MHC-SF is a valid instrument. The Pearson Correlation Coefficient results for convergent and divergent validity showed the relationship between the MHC-SF-A subscales for assessing the internal homogeneity of the test. Between anxiety and depression, depression covered a broader conceptualization of well-being. This means that depression on a health-affirming measure, for example, is most strongly correlated with the total score of the MHC-SF, a measure

TABLE 3 Standard estimate and *t*-value for the relationship between the item and the factor in the three-factor model.

Factor	Item	Factor loading	*t*-value
Emotional Wellbeing	Happy	0.65	7.31
	Interested in life	0.58	6.25
	Satisfied	0.55	6.04
Social Wellbeing	That you had something important to contribute to society	0.61	7.09
	That you belonged to a community (like a group of friends, at school or in the neighborhood)	0.51	5.87
	That our society is becoming a better place for people	0.57	6.16
	That people are basically good	0.58	6.20
	That the way our society works makes sense to you	0.59	6.29
Psychological Wellbeing	That you liked most parts of your personality	0.63	7.24
	Good at managing the responsibilities of your daily life	0.57	6.18
	That you had warm and trusting relationships with others	0.60	6.34
	That you have experiences that challenge you to grow and become a better person	0.64	7.28
	Confident to think or express your own ideas and opinions	0.49	5.53
	That your life has a sense of direction or meaning to it	0.63	7.20

of general well-being. According to Keyes' conceptualization (Keyes, 2002), MHC-SF-A is expected to be negatively related to anxiety and depression. Previous studies have also demonstrated the convergent validity of the emotional, social, and psychological aspects of mental well-being (Keyes et al., 2012; Joshanloo et al., 2013).

In addition to convergent validity, the MHC–SF was found to have divergent and discriminant validity in the current investigation. Mental disorder and mental health, according to the two-continua concept, are connected but separate dimensions. The current study demonstrates that mental health measures are connected to, but separate from, mental disorder measures. This obviously means that the lack of mental disorder does not always imply the existence of mental health, requiring the development of a mental health assessment tool.

Generally, the MHC-SF is a beneficial, short self-report questionnaire for evaluating of mental health. Consequently, research helps fill knowledge gaps about the authenticity and usefulness of the MHC-SF in national cultures around the world for positive mental health measures.

There are some limitations that need to be taken into account in this study. Weak correlations are statistically significant due to the large sample size. As a result, we applied an alpha of 0.001 instead of the common 0.05 as a margin of significance in the validation analyses. Due to the extremely limiting assumptions of the CFA approach and resulting inflation of the interrelationships, the future studies are capable of applying Exploratory Structural Equation Modeling (ESEM) to illustrate the factor structure of multidimensional constructs such as mental well-being. What is more, future research will be able to discover the validity of the Iranian MHC–SF, and the three categorizations for positive mental health and people in different sorting.

According to the results, there are some vital implications for mental health policy and care. Recently, mental health care concentrates mostly on psychopathology in either diagnostics or treatment. Nevertheless, with mental health and mental disorder being two detached indices of mental health, it may be useful to concentrate also on boosting of positive mental health. It is hoped that this study will cover the path for more knowledgeable and inclusive conceptualization and assessment of mental well-being in different age groups.

Conclusion

In this research, in relation to the level of mental health, we administered the Mental Health Continuum-Short Form (Keyes et al., 2008) to a large Iranian sample (aged from 11 to 18 years) to examine its factor structure, psychometrics, and benefit in determining the level of functioning among Keyes' (Keyes, 2002) model. Consequently, to our knowledge, the present study is among the first to confirm a measure of Iranian adolescences' positive mental health and presents primary confirmation that the MHC-SF can be applied to younger participants.

TABLE 4 Measurement invariance across gender.

model	X^2	df	CFI	RMSEA	ΔX^2	Δdf	*p*	ΔCFI	ΔRMSEA
Configural invariance	339.33	149	0.942	0.062	–	–		–	–
Metric Invariance	352.85	160	0.940	0.061	13.52	11	0.260	0.002	0.001
Scalar invariance	362.19	164	0.942	0.060	22.86	15	0.087	0.000	0.002
Strict Invariance	379.43	178	0.938	0.061	40.10	29	0.082	0.004	0.001

TABLE 5 Pearson correlation coefficients for construct validity.

Measure	MHC-SF subscale			MHC-SF total
	Emotional	Psychological	Social	
Divergent validity				
Anxiety (DASS-21)	−0.40***	−0.330***	−0.290***	−0.37***
Depression (DASS-21)	−0.430***	−0.370***	−0.360***	−0.40***
Convergent validity				
Quality of life (Kidscreen-27)	0.480***	0.470***	0.400***	0.45***
Positive affect (PANAS-C)	0.500***	0.43	0.380***	0.44***
Internal Consistency				
MHC-SF subscale				
Emotional	–			
Psychological	0.620***	–		
Social	0.500***	0.550***	–	

***$p < 0.001$.

TABLE 6 Composite reliabilities and Cronbach alpha coefficients for MHC-SF-A subscales.

Scale	CR	α
Emotional	0.87	0.84
Psychological	0.85	0.85
Social	0.86	0.82
MHC-SF total	0.88	0.87

These results support the findings of prior research in terms of adolescents (Keyes, 2006a,b; Matos et al., 2010), implying that this conceptualization of mental health can be appropriate from immaturity to maturity. To sum up, we deliberate the MHC-SF to be a psychometrically sound questionnaire for general mental well-being in relation to Iranian adolescents.

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 Ethics Committee of Kermanshah University of Medical Sciences. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

MYA conceived and designed the research; MYA and PJ collected, organized and analyzed the data; MYA wrote the paper. MYA and PJ read and approved the final manuscript.

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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.

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References

Antaramian, S. P., Huebner, E. S., Hills, K. J., and Valois, R. F. (2010). A dual-factor model of mental health: toward a more comprehensive understanding of youth functioning. *Am. J. Orthopsychiatry* 80, 462–472. doi: 10.1111/j.1939-0025.2010.01049.x

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., and Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample. *Psychol. Assess.* 10, 176–181. doi: 10.1037/1040-3590.10.2.176

Asghari, A., Saed, F., and Dibajnia, P. (2008). Psychometric properties of the depression anxiety stress Scales-21 (DASS-21) in a non-clinical Iranian sample. *Int. J. Psychol.* 2, 82–102.

Beesdo, K., Pine, D. S., Lieb, R., and Wittchen, H. U. (2010). Incidence and risk patterns of anxiety and depressive disorders and categorization of generalized anxiety disorder. *Arch. Gen. Psychiatry* 67, 47–57. doi: 10.1001/archgenpsychiatry.2009.177

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Struct. Equ. Model. Multidiscip. J.* 14, 464–504. doi: 10.1080/10705510701301834

Cheung, G. W., and Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Struct. Equ. Model.* 9, 233–255. doi: 10.1207/S15328007SEM0902_5

Diener, E., Suh, E. M., Lucas, R. E., and Smith, H. L. (1999). Subjective well-being: three decades of progress. *Psychol. Bull.* 125, 276–302. doi: 10.1037/0033-2909.125.2.276

Donnelly, A., O'Reilly, A., Dolphin, L., O'Keeffe, L., and Moore, J. (2019). Measuring the performance of the mental health continuum-short form (MHC-SF) in a primary care youth mental health service. *Ir. J. Psychol. Med.* 36, 201–205. doi: 10.1017/ipm.2018.55

Doré, I., O'Loughlin, J. L., Sabiston, C. M., and Fournier, L. (2017). Psychometric evaluation of the mental health continuum–short form in French Canadian Young adults. *Can. J. Psychiatry* 62, 286–294. doi: 10.1177/0706743716675855

Ebesutani, C., Regan, J., Smith, A., Reise, S., Higa-McMillan, C., and Chorpita, B. F. (2012). The 10-item positive and negative affect schedule for children, child and parent shortened versions: application of item response theory for more efficient assessment. *J. Psychopathol. Behav. Assess.* 34, 191–203. doi: 10.1007/s10862-011-9273-2

Echeverría Errázuriz, G., Torres, M., Pedrals, N., Padilla, O., Rigotti Rivera, A., and Bitrán Carreño, M. (2017). Validation of a Spanish version of the mental health continuum-short form questionnaire. Validación de la versión en español del Cuestionario del Continuo de Salud Mental-Versión Corta.

Fen, C. M., Isa, I., Chu, C. W., Ling, C., and Ling, S. Y. (2013). Development and validation of a mental wellbeing scale in Singapore. *Psychology* 04, 592–606. doi: 10.4236/psych.2013.47085

Gross, J. J. (2002). Emotion regulation: affective, cognitive, and social consequences. *Psychophysiology* 39, 281–291. doi: 10.1017/S0048577201393198

Guo, C., Tomson, G., Guo, J., Li, X., Keller, C., and Söderqvist, F. (2015). Psychometric evaluation of the mental health continuum-short form (MHC-SF) in Chinese adolescents–a methodological study. *Health Qual. Life Outcomes* 13, 1–9. doi: 10.1186/s12955-015-0394-2

Heizomi, H., Allahverdipour, H., Jafarabadi, M. A., Bhalla, D., and Nadrian, H. (2020). Effects of a mental health promotion intervention on mental health of Iranian female adolescents: a school-based study. *Child Adolesc. Psychiatry Ment. Health* 14, 1–10. doi: 10.1186/s13034-020-00342-6

Hofmann, S. G., Sawyer, A. T., Fang, A., and Asnaani, A. (2012). Emotion dysregulation model of mood and anxiety disorders. *Depress. Anxiety* 29, 409–416. doi: 10.1002/da.21888

Insel, T., and Scolnick, E. (2006). Cure therapeutics and strategic prevention: raising the bar for mental health research. *Mol. Psychiatry* 11, 11–17. doi: 10.1038/sj.mp.4001777

Joshanloo, M. (2016). A new look at the factor structure of the MHC-SF in Iran and the United States using exploratory structural equation modeling. *J. Clin. Psychol.* 72, 701–713. doi: 10.1002/jclp.22287

Joshanloo, M., Wissing, M. P., Khumalo, I. P., and Lamers, S. M. (2013). Measurement invariance of the mental health continuum-short form (MHC-SF) across three cultural groups. *Personal. Individ. Differ.* 55, 755–759. doi: 10.1016/j.paid.2013.06.002

Karaś, D., Cieciuch, J., and Keyes, C. L. (2014). The polish adaptation of the mental health continuum-short form (MHC-SF). *Personal. Individ. Differ.* 69, 104–109. doi: 10.1016/j.paid.2014.05.011

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., et al. (2010). Childhood adversities and adult psychopathology in the WHO world mental health surveys. *Br. J. Psychiatry* 197, 378–385. doi: 10.1192/bjp.bp.110.080499

Keyes, C. L. M. (1998). Social well-being. *Soc. Psychol. Q.* 61, 121–140. doi: 10.2307/2787065

Keyes, C. L. (2002). The mental health continuum: from languishing to flourishing in life. *J. Health Soc. Behav.* 43, 207–222. doi: 10.2307/3090197

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *J. Consult. Clin. Psychol.* 73, 539–548. doi: 10.1037/0022-006X.73.3.539

Keyes, C. L. (2006a). Mental health in adolescence: is America's youth flourishing? *Am. J. Orthopsychiatry* 76, 395–402. doi: 10.1037/0002-9432.76.3.395

Keyes, C. L. (2006b). *The Subjective Well-being of America's Youth: Toward a Comprehensive Assessment* Adolescent & Family Health 4, 3–11.

Keyes, C. L. (2007). Promoting and protecting mental health as flourishing: a complementary strategy for improving national mental health. *Am. Psychol.* 62, 95–108. doi: 10.1037/0003-066X.62.2.95

Keyes, C. L., Eisenberg, D., Perry, G. S., Dube, S. R., Kroenke, K., and Dhingra, S. S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *J. Am. Coll. Heal.* 60, 126–133. doi: 10.1080/07448481.2011.608393

Keyes, C. L., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., and Van Rooy, S. (2008). Evaluation of the mental health continuum–short form (MHC–SF) in setswana-speaking south Africans. *Clin. Psychol. Psychother.* 15, 181–192. doi: 10.1002/cpp.572

Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., et al. (2011). Child and adolescent mental health worldwide: evidence for action. *Lancet* 378, 1515–1525. doi: 10.1016/S0140-6736(11)60827-1

Koole, S. L. (2010). *The Psychology of Emotion Regulation: An Integrative Review* (pp. 138–177). Hove: Psychology press.

Kopp, C. B. (1989). Regulation of distress and negative emotions: a developmental view. *Dev. Psychol.* 25, 343–354. doi: 10.1037/0012-1649.25.3.343

Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., and Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *J. Clin. Psychol.* 67, 99–110. doi: 10.1002/jclp.20741

Lee, F. S., Heimer, H., Giedd, J. N., Lein, E. S., Šestan, N., Weinberger, D. R., et al. (2014). Adolescent mental health—opportunity and obligation. *Science* 346, 547–549. doi: 10.1126/science.1260497

Lim, Y.-J. (2014). Psychometric characteristics of the Korean mental health continuum–short form in an adolescent sample. *J. Psychoeduc. Assess.* 32, 356–364. doi: 10.1177/0734282913511431

Longo, Y., Jovanović, V., Sampaio de Carvalho, J., and Karaś, D. (2020). The general factor of well-being: multinational evidence using bifactor ESEM on the mental health continuum–short form. *Assessment* 27, 596–606. doi: 10.1177/1073191117748394

Lotfi, M., Bahrampoori, L., Amini, M., Fatemitabar, R., Birashk, B., and Shiasi, Y. (2020). Developing the Persian version of positive and negative affect scale for children (original and short form) and assessing its psychometric properties. *Iranian J. Psychiatry Clin. Psychol.* 25, 440–453. doi: 10.32598/ijpcp.25.4.7

Luijten, C. C., Kuppens, S., van de Bongardt, D., and Nieboer, A. P. (2019). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Dutch adolescents. *Health Qual. Life Outcomes* 17, 1–10. doi: 10.1186/s12955-019-1221-y

Matos, A. P., André, R. S., Cherpe, S., Rodrigues, D., Figueira, C., and Pinto, A. M. (2010). Preliminary psychometric study of the mental health continuum–short form–for youth, in a sample of Portuguese adolescents. *Psychologica* 53, 131–156. doi: 10.14195/1647-8606_53_7

Mohammadi, M. R., Ahmadi, N., Khaleghi, A., Mostafavi, S. A., Kamali, K., Rahgozar, M., et al. (2019). Prevalence and correlates of psychiatric disorders in a national survey of Iranian children and adolescents. *Iran. J. Psychiatry* 14, 1–15. doi: 10.18502/ijps.v14i1.418

Mohammadi, M. R., Salmanian, M., Ghanizadeh, A., Alavi, A., Malek, A., Fathzadeh, H., et al. (2014). Psychological problems of Iranian children and adolescents: parent report form of strengths and difficulties questionnaire. *J. Ment. Health* 23, 287–291. doi: 10.3109/09638237.2014.924049

Nik-Azin, A., Naeinian, M. R., and Shairi, M. R. (2013). Validity and reliability of health related quality of life questionnaire" KIDSCREEN-27" in a sample of Iranian students. *Iranian J. Psychiatry Clin. Psychol.* 18, 310–321.

Oei, T. P., Sawang, S., Goh, Y. W., and Mukhtar, F. (2013). Using the depression anxiety stress scale 21 (DASS-21) across cultures. *Int. J. Psychol.* 48, 1018–1029. doi: 10.1080/00207594.2012.755535

Parrott, W. G. (1993). "Beyond hedonism: motives for inhibiting good moods" in *Handbook of Mental Control*. eds. D. M. Wegner and J. W. Pennebaker (NJ, USA: Englewood Cliffs: Prentice Hall), 278–308.

Perugini, M. L. L., de la Iglesia, G., Solano, A. C., and Keyes, C. L. M. (2017). The mental health continuum–short form (MHC–SF) in the Argentinean context: confirmatory factor analysis and measurement invariance. *Eur. J. Psychol.* 13, 93–108. doi: 10.5964/ejop.v13i1.1163

Petrillo, G., Capone, V., Caso, D., and Keyes, C. L. (2015). The mental health continuum–short form (MHC–SF) as a measure of well-being in the Italian context. *Soc. Indic. Res.* 121, 291–312. doi: 10.1007/s11205-014-0629-3

Rafiey, H., Alipour, F., LeBeau, R., Amini Rarani, M., Salimi, Y., and Ahmadi, S. (2017). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF) in Iranian earthquake survivors. *Int. J. Ment. Health* 46, 243–251. doi: 10.1080/00207411.2017.1308295

Ravens-Sieberer, U., Gosch, A., Rajmil, L., Erhart, M., Bruil, J., Power, M., et al. (2008). The KIDSCREEN-52 quality of life measure for children and adolescents: psychometric results from a cross-cultural survey in 13 European countries. *Value Health* 11, 645–658. doi: 10.1111/j.1524-4733.2007.00291.x

Rogoza, R., Truong Thi, K. H., Różycka-Tran, J., Piotrowski, J., and Żemojtel-Piotrowska, M. (2018). Psychometric properties of the MHC-SF: an integration of the existing measurement approaches. *J. Clin. Psychol.* 74, 1742–1758. doi: 10.1002/jclp.22626

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57, 1069–1081. doi: 10.1037/0022-3514.57.6.1069

Salama-Younes, M. (2011). "Validation of the mental health continuum short form and subjective vitality scale with Egyptian adolescent athletes," in *The human pursuit of well-being: A cultural approach*. ed. I. Brdar. (London: Springer), 221–234.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., and King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: a review. *J. Educ. Res.* 99, 323–338. doi: 10.3200/JOER.99.6.323-338

Sharifi, V., Amin-Esmaeili, M., Hajebi, A., Motevalian, A., Radgoodarzi, R., Hefazi, M., et al. (2015). Twelve-month prevalence and correlates of psychiatric disorders in Iran: the Iranian mental health survey, 2011. *Arch. Iran. Med.* 18, 76–84. PMID: 25644794

Sharifi, V., Shahrivar, Z., and Alaghband-Rad, J. (2016). Child and adolescent mental health care in Iran: current status and future directions. *Arch. Iran. Med.* 19, 797–804. PMID: 27845550

Singh, K., Bassi, M., Junnarkar, M., and Negri, L. (2015). Mental health and psychosocial functioning in adolescence: an investigation among Indian students from Delhi. *J. Adolesc.* 39, 59–69. doi: 10.1016/j.adolescence.2014.12.008

Snyder, C. R., Rand, K. L., and Sigmon, D. R. (2002). *Hope theory: A member of the positive psychology family*.

Statistical Center of Iran. (2016). *Population and Housing Census* Tehran: Statistical Center of Iran

Weisz, J. R., Kuppens, S., Ng, M. Y., Eckshtain, D., Ugueto, A. M., Vaughn-Coaxum, R., et al. (2017). What five decades of research tells us about the effects of youth psychological therapy: a multilevel meta-analysis and implications for science and practice. *Am. Psychol.* 72, 79–117. doi: 10.1037/a0040360

Werner-Seidler, A., Banks, R., Dunn, B. D., and Moulds, M. L. (2013). An investigation of the relationship between positive affect regulation and depression. *Behav. Res. Ther.* 51, 46–56. doi: 10.1016/j.brat.2012.11.001

World Health Organization. (2004). *Promoting Mental health: Concepts, Emerging Evidence, Practice Summary Report* Geneva: World Health Organization.

World Health Organization. (2014). *Health for the World's Adolescents: A Second Chance in the Second Decade* (Summary: No. WHO/FWC/MCA/14.05). Geneva: World Health Organization.

Young, K. S., Sandman, C. F., and Craske, M. G. (2019). Positive and negative emotion regulation in adolescence: links to anxiety and depression. *Brain Sci.* 9:76. doi: 10.3390/brainsci9040076

Zimmermann, P., and Iwanski, A. (2014). Emotion regulation from early adolescence to emerging adulthood and middle adulthood: age differences, gender differences, and emotion-specific developmental variations. *Int. J. Behav. Dev.* 38, 182–194. doi: 10.1177/0165025413515405

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Hedonic and eudaimonic well-being for sustainable development in university students: personality traits or acceptance of change?

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Introduction: The psychology of sustainability and sustainable development aims to contribute to the establishment of a culture of sustainability regarding the 2030 Agenda and its 17 sustainable development goals.

Methods: In this framework, this study examined the associations between acceptance of change and well-being (hedonic and eudaimonic sides), controlling for the effects of personality traits, in 284 Italian university students.

Results: Acceptance of change explained additional variance over personality traits regarding hedonic and eudaimonic well-being.

Discussion: Acceptance of change could thus represent a promising well-being resource from the perspective of strength-based prevention, opening future perspectives to face the challenges of sustainable development, particularly concerning Goal 3 of the 2030 Agenda: "Good health and well-being."

KEYWORDS

acceptance of change, hedonic well-being, eudemonic well-being, personality traits, sustainability, sustainable development, good health and well-being

Introduction

The 2030 Agenda of the United Nations has advanced 17 sustainable development goals (see Table 1) to promote sustainability worldwide. The psychology of sustainability and sustainable development (PSSD) (Di Fabio and Rosen, 2018, 2020; Rosen and Di Fabio, n.d.) is a current research area contributing to the transdisciplinary framework of sustainability science (Rosen, 2017), and it supports a preventive culture regarding the 2030 Agenda and its 17 sustainable development goals.

Currently, we are facing enormous challenges in an even more turbulent scenario than that which appeared at the beginning of the 21st century (Blustein et al., 2019); it is impacting the labor market and is characterized by change and instability. This new scenario is accelerating and increasing in intensity: on the one hand are acceleration, change, and precariousness; on the other hand are pandemics, war, climatic changes, etc. To deal with these changeable and demanding new contexts, people must adapt incessantly to change, and

TABLE 1 The 17 sustainable development goals of the 2030 Agenda.

GOAL 1 No poverty
GOAL 2 Zero hunger
GOAL 3 Good health and well-being
GOAL 4 Quality education
GOAL 5 Gender equality
GOAL 6 Clean water and sanitation
GOAL 7 Affordable and clean energy
GOAL 8 Decent work and economic growth
GOAL 9 Industry, innovation and infrastructure
GOAL 10 Reduced inequality
GOAL 11 Sustainable cities and communities
GOAL 12 Responsible consumption and production
GOAL 13 Climate action
GOAL 14 Life below water
GOAL 15 Life on land
GOAL 16 Peace and justice strong institutions
GOAL 17 Partnerships to achieve the goal

strength is required to constructively cope with change (Di Fabio and Gori, 2016a). Individuals who consider change as a possibility to discover and develop have a higher probability of responding positively to the difficulties of the present scenario (Blustein et al., 2019), successfully facing threats and shifts and thus enhancing well-being (Di Fabio and Kenny, 2016).

Theoretical background

The concept of acceptance of change (Di Fabio and Gori, 2016a) refers to the tendency to encompass change. It includes the following factors: predisposition to change—the perception of individuals that they might acquire something as a result of change by utilizing change to increase the quality of their lives; support for change—support is perceived to be received from other people in the face of changes; change seeking—behavior where a person pursues change; acquiring and retaining information as well as exhibiting a need to receive novel stimulation; a positive reaction to change as perceived by positive emotions resulting from changing; positively experiencing and benefiting from change. Cognitive flexibility is perceived as having the "ability to think about multiple concepts simultaneously, to change decisions if this is advantageous, and to change plans and routines easily" (Di Fabio and Gori, 2016a, p. 2).

Resistance to change (Oreg, 2003) has traditionally been studied in literature and is considered the dark side of change processes. With the introduction of the acceptance of change (Di Fabio and Gori, 2016a), a new positive preventive perspective was proposed concerning change processes based on promoting resources and not only on reducing dysfunctionalities (Di Fabio, 2017a). From this perspective, acceptance of change is conceptualized as a resource to constructively face changes, permitting individuals to find ways to deal successfully with challenges and promote their well-being (Di Fabio and Gori, 2016a). This perspective is in line with positive psychology (Seligman and Csikszentmihalyi, 2000; Seligman, 2002), which is focused on the study of well-being by considering human strengths instead of failures. In this framework, the acceptance of change represents a positive resource for individuals to cope with the complex challenges they can meet in their lives.

Occupational health psychology has emphasized the value of a positive health perspective by considering the relevance of promoting the health, well-being, flourishing, and optimal functioning of workers (Tetrick and Peiró, 2012). It is proposed (Di Fabio et al., 2020) that this positive approach is integrated with a strength-based prevention perspective (Di Fabio and Saklofske, 2021) for healthy organizations. The focus is on a primary preventive approach focused on building workers' positive individual resources for enhancing both well-being and performance in organizations (Di Fabio et al., 2020), thus facilitating the achievement of the third goal of the 2030 Agenda, "Good health and well-being."

According to this perspective, well-being has to be considered both from the hedonic (Kahneman et al., 1999) and eudaimonic perspectives (Ryff and Singer, 2008) as well as from strength-based prevention perspectives (Di Fabio and Saklofske, 2021) considering the crucial asset of constructing personal resources (Di Fabio and Kenny, 2021) to foster well-being. In this preventive framework, including a primary preventive perspective (Di Fabio and Kenny, 2021), the acceptance of change is conceived as a promising resource related to well-being, advancing the research related to determinants of well-being, personality factors, and personal and environmental resources (Ramaci et al., 2020; Bellini et al., 2022; De Giorgio et al., 2023).

In the literature, some constructs holding the same perspective of acceptance of change in organizations were studied in relation to well-being: readiness for change (Helfrich et al., 2018), commitment to change (Jing et al., 2014), and change culture (Quigley et al., 2022). Specifically, regarding the relationships between acceptance of change and well-being, acceptance of change was positively associated with both hedonic well-being (life satisfaction) and eudaimonic well-being (flourishing) in workers and students (Di Fabio and Gori, 2016a). Another study (Di Fabio et al., 2016) conducted on Italian workers reported positive correlations between acceptance of change and both life satisfaction and meaning in life. Furthermore, two further studies conducted on Italian workers indicated that acceptance of change was positively linked to job satisfaction (Di Fabio and Gori 2020; Gori and Topino, 2020). In this context, acceptance of change appears particularly promising in relation to "good health and well-being," the third of the 17 SDGs of the 2030 Agenda of the United Nations. Therefore, acceptance of change emerges as a deeply embedded theme in the PSSD research area (Di Fabio, 2017a,b; Di Fabio and Rosen, 2018, 2020), which also highlights the importance of prevention.

Analyzing the literature, to the best of our knowledge, no research exists that has specifically studied the relationships between the acceptance of change construct (Di Fabio and Gori, 2016a) and well-being that also considers personality traits. Furthermore, concerning the acceptance of change, no studies have simultaneously considered the following aspects of hedonic well-being: positive affect, negative affect, and life satisfaction; and the same can be said for the following aspects of eudaimonic well-being: meaning in life and flourishing. Consequently, the following hypotheses are proposed: acceptance of change explains additional variance regarding positive affect (H1), negative affect (H2), life

satisfaction (H3), meaning in life (H4), and flourishing (H5) beyond that accounted for by personality traits.

Method

Participants and procedure

A total of 284 university psychology students from the University of Florence (28.52% male and 71.48% female; mean age = 22.81 years, SD = 1.88) participated in the study. University students participated voluntarily in the study and were not compensated. They provided informed consent. Instruments were administered to groups by specialized personnel adhering to Italian privacy laws (DL-196/2003; EU 2016/679). The administration order of the measures was balanced to contain the presentation order effects. The study was approved by the Ethical Committee of the Integrated Psychodynamic Psychotherapy Institute (IPPI) (IPPI Ethical Committee Number 016/2022).

Measures

We used The following measures.

Big five questionnaire (BFQ; Caprara et al., 1993), 132 items (1–5, from «*Absolutely false*» to «*Absolutely true*»), five factors: emotional stability (Alpha = 0.90), extraversion (Alpha = 0.81), conscientiousness (Alpha = 0.81), Openness (Alpha = 0.75), and Agreeableness (Alpha = 0.73).

Acceptance of change scale (ACS; Di Fabio and Gori, 2016a), 20 items (1–5, from «*Not at all* » to «A *great deal*»), five dimensions: predisposition to change (Alpha = 0.83), support for change (Alpha = 0.79), change seeking (Alpha = 0.80), positive reaction to change (Alpha = 0.75), and cognitive flexibility (Alpha = 0.72).

Positive and negative affect schedule (PANAS; Watson et al., 1988; Italian version Terraciano et al., 2003), 20 adjectives (1–5, from «*Very slightly or not at all*» to «*Extremely*»), PA (Alpha = 0.83), and NA (Alpha = 0.85).

Satisfaction with life scale (SWLS; Diener et al., 1985, Italian version, Di Fabio and Gori, 2016b): 5 items (1–7, from «*Strongly disagree*» to «*Strongly agree*») and Alpha coefficient: 0.85.

Meaning in life measure (MLM; Morgan and Farsides, 2009, Italian version Di Fabio, 2014): 23 items (1–7, from «*Strongly disagree*» to «*Strongly agree*»), five dimensions: exciting life, accomplished life, principled life, purposeful life, valued life, and alpha coefficient: 0.85 (total score).

Flourishing scale (FS; Diener et al., 2010, Italian version by Di Fabio, 2016): 8 items (1–7, from «*Strongly disagree*» to «*Strongly agree*») and Alpha coefficient: 0.88.

Data analysis

Descriptive statistics, Pearson's *r* correlations, and hierarchical regressions were calculated using the IBM SPSS Statistics software (version 28). We carried out hierarchical regressions with personality traits during the first step, acceptance of change dimensions during the second step, and alternated positive affect, negative affect, satisfaction with life, meaning in life, and flourishing as the dependent variables.

Results

Table 2 presents the descriptive statistics for the study variables.
Table 3 presents Pearson's *r* correlations for the study variables.
Table 4 presents the results of the hierarchical regressions.

TABLE 2 Descriptive statistics for the study variables.

	M	SD	Skewness	Kurtosis
1. BFQ extraversion	75.32	9.20	−0.31	0.34
2. BFQ agreeableness	79.51	9.00	−0.08	0.73
3. BFQ conscientiousness	82.07	9.90	0.55	0.16
4. BFQ emotional stability	68.45	12.57	−0.33	0.39
5. BFQ openness	82.02	9.20	0.13	−0.31
6. ACS predisposition to change	12.49	2.61	−0.05	0.27
7. ACS support for change	14.28	2.98	−0.30	−0.15
8. ACS change seeking	10.05	2.83	0.38	−0.16
9. ACS positive reaction to change	13.21	2.42	0.20	0.08
10. ACS cognitive flexibility	13.95	2.63	−0.14	0.26
11. PANAS positive affect	35.33	5.21	0.01	−0.08
12. PANAS negative affect	22.43	8.40	0.80	0.41
13. SWLS satisfaction with life	23.48	6.38	−0.53	0.09
14. MLM meaning in life	115.31	16.66	0.08	−0.42
15. FS flourishing	42.68	7.70	−0.21	−0.60

N = 284.

TABLE 3 Correlations among BFQ, ACS, PANAS, SWLS, MLM, FS.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. BFQ extraversion	–														
2. BFQ agreeableness	0.16*	–													
3. BFQ conscientiousness	0.17**	0.13*	–												
4. BFQ emotional stability	0.18**	0.28**	0.14*	–											
5. BFQ openness	0.21**	0.44**	0.17**	0.17**	–										
6. ACS predisposition to change	0.34**	0.13*	0.06	0.31**	0.28**	–									
7. ACS support for change	0.12*	0.22**	0.01	0.23**	0.02	0.34**	–								
8. ACS change seeking	0.10	0.03	−0.16**	0.09	0.23**	0.40**	0.10	–							
9. ACS positive reaction to change	0.16**	0.16**	0.03	0.19**	0.19**	0.45**	0.27**	0.34**	–						
10. ACS cognitive flexibility	0.12*	0.22**	0.11*	0.10	0.17**	0.33**	0.27**	0.28**	0.37**	–					
11. PANAS positive affect	0.53**	0.07	0.23**	0.17**	0.23**	0.40**	0.33**	−0.11	0.23**	0.12*	–				
12. PANAS negative affect	−0.15*	−0.35**	−0.03	−0.39**	−0.24**	−0.05	−0.17**	0.14*	−0.09	−0.05	−0.14*	–			
13. SWLS satisfaction with life	0.32**	0.26**	0.10	0.27**	0.12	0.35**	0.43**	−0.02	0.04	0.14*	0.47**	−0.29**	–		
14. MLM meaning in life	0.44**	0.30**	0.26**	0.25**	0.36**	0.40**	0.16**	−0.26**	0.06	0.09	0.64**	−0.40**	0.63**	–	
15. FS flourishing	0.40**	0.31**	0.21**	0.22**	0.34**	0.41**	0.37**	−0.13*	0.09	0.07	0.58**	−0.36**	0.58**	0.77**	–

$N = 284$. * < 0.05, ** < 0.01.

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TABLE 4 Hierarchical regression: contribution of big five (BFQ) and ACS dimensions in relation to PANAS, SWLS, MLM, FS.

	PANAS PA	PANAS NA	SWLS	MLM	FS
	β	*β*	*β*	*β*	*β*
Step 1					
BFQ extraversion	0.46**	−0.07	0.28**	0.33**	0.31**
BFQ agreeableness	0.06	−0.24**	0.22**	0.14**	0.18**
BFQ conscientiousness	0.16**	−0.04	0.06	0.17**	0.12**
BFQ emotional stability	0.11**	−0.29**	0.18**	0.14**	0.10**
BFQ openness	0.12**	−0.08	0.08	0.18**	0.16**
Step 2					
ACS predisposition to change	0.14*	−0.13	0.23**	0.30**	0.31**
ACS support for change	0.27**	−0.08	0.32**	0.14*	0.29**
ACS change seeking	−0.00	0.20**	−0.08	−0.24**	−0.14*
ACS positive reaction to change	0.04	−0.06	0.05	0.01	0.14*
ACS cognitive flexibility	0.08	−0.01	0.16**	0.12	0.13
R^2 *step 1*	0.32***	0.23***	0.19***	0.33***	0.28***
ΔR^2 *step 2*	0.10***	0.05**	0.15***	0.12***	0.16***
R^2 *total*	0.42***	0.28***	0.34***	0.45***	0.44***

$N = 284$; * < 0.05, ** < 0.01, *** $p < 0.001$.

Regarding positive affect, BFQ explained 32% of the variance, and the ACS dimensions explained 10%, for a total variance of 42%.

Regarding negative affect, BFQ explained 23% of the variance, and the ACS dimensions explained 5%, for a total variance of 28%.

Regarding satisfaction with life, BFQ explained 19% of the variance, and the ACS dimensions added 15%, for a total variance of 34%.

Concerning meaning in life, the BFQ explained 33% of the variance, and the ACS dimensions added 12%, for a total variance of 45%.

Concerning flourishing, BFQ explained 28% of the variance, and the ACS dimensions added 16%, for a total variance of 44%.

Discussion

This study analyzed, for the first time, the associations between the acceptance of change construct (Di Fabio and Gori, 2016a) and both hedonic (PA, NA, SWLS) and eudaimonic well-being (MLM, FS), considering personality traits, in Italian university students. Our findings support this hypothesis.

Regarding hedonic well-being, the results confirmed the first hypothesis. Acceptance of change explained additional variance to the big five for positive affect. Particularly, regarding positive affect, positive significant relationships emerged with the predisposition to change dimension as well as with support for changing dimension. Aspects of acceptance of change relative to individuals' perceptions of acquiring from change and applying changes to increase their quality of life as well as perceiving social support in coping with changes (Di Fabio and Gori, 2016a) are related to the propensity to experience positive emotions (Watson et al., 1988). These results highlighted that considering change as a positive challenge and perceiving support from others in facing change were associated with the positive affect experienced by the participants in this study.

The findings confirm the second hypothesis. Acceptance of change explained additional variance to the big five for negative affect. Particularly, negative affect indicated a significant direct relationship with the change-seeking dimension. This relationship is interesting, even if it may seem counterintuitive at first. In this study, a search for change was associated with the experience of negative affect, probably because the perception of looking for change and exhibiting a necessity for new stimuli (Di Fabio and Gori, 2016a) could be connected to encountering the world more negatively (Watson et al., 1988), and perhaps a need for change could emerge.

Thus, the third hypothesis was confirmed. Acceptance of change explained the additional variance to the big five for life satisfaction. Particularly, life satisfaction was positively associated with support for change, predisposition to change, and cognitive flexibility dimensions, in this order of importance. In this study, different aspects of acceptance of change were associated with the global satisfaction of an individual's existence (Diener et al., 1985): the perception of support received by others in facing change, primarily the perception of being predisposed to change, and the perception of having the capacity to shift between various conceptions using adaptive cognitive strategies. A global positive evaluation of one's life includes aspects of relational satisfaction (Diener et al., 1985) and thus appears to be associated with the perception of being supported by others in the face of changes. Moreover, being satisfied with one's life includes aspects related to a predisposition to change regarding the perception of having opportunities to learn from change as well as the perception of being able to face the challenges of life (Diener et al., 1985). Life satisfaction, as a cognitive aspect of hedonic well-being regarding favorable evaluation of personal life rather than present feelings (Diener et al., 1985), was also connected to the cognitive flexibility of acceptance of change in this study. It is worth emphasizing that life satisfaction was the only aspect of well-being significantly associated with the cognitive flexibility dimension of acceptance of change in this study, probably because these two variables are more closely linked to cognitive processes. The findings of this study, thus, documented the relationships between acceptance of change and diverse facets of hedonic well-being, even after considering personality.

Regarding eudaimonic well-being, our results confirmed the fourth hypothesis. Acceptance of change explained additional variance to the big five for meaning in life. Meaning in life indicated significant positive relationships with the predisposition to change and support for change dimensions and a significant inverse relationship with the change-seeking dimension. In this study, a greater acknowledgment and awareness of meaningful and authentic goals (Morgan and Farsides, 2009) is positively related to different features of acceptance of change regarding the perception of being predisposed to change and being supported by others when facing changes. The findings emphasize the value of a positive attitude toward change concerning predisposition to change and support for change in eudaimonic well-being as authenticity and self-realization. The inverse relationship between the change-seeking dimension and meaning in life could highlight that the participants in this study, seeking new stimuli and probably experiencing a less meaningful life, could be pushed towards novelties.

Finally, the fifth hypothesis was confirmed. Acceptance of change explained the additional variance to the big five for flourishing. Particularly, flourishing indicated significant positive relationships with the predisposition to change, support for change, and positive reaction to change dimensions, whereas a significant inverse relationship emerged with the change-seeking dimension. It is possible to notice a more comprehensive form of eudaimonic well-being, namely, flourishing, defining it as the perception of psychological well-being concerning "relationships, self-esteem, purpose, and optimism" (Diener et al., 2010, p. 143) that resulted from the majority of the dimensions of acceptance of change, including also the positive reaction to change dimension. In this study, acceptance of change in terms of predisposition to change, support for change, and positive reaction to change seem to be relevant for achieving a form of eudaimonic well-being that permits flourishing, functioning optimally, and developing to the best of one's possibilities (Diener et al., 2010). Furthermore, the link between flourishing and change seeking was inverse, indicating that in this study, when participants sought change, they appeared to experience less eudaimonic well-being regarding flourishing, just as the desire to change appears to be motivated by a desire to achieve greater overall eudaimonic well-being. Thus, acceptance of change emerged in this study regarding aspects of eudaimonic well-being concerning both meaning in life and flourishing.

Further reflections can be emphasized regarding the associations between acceptance of change and different forms of well-being. In this study, the contribution of acceptance of change was greater for the eudaimonic well-being aspect of flourishing, followed by satisfaction with life for hedonic well-being and meaning in life for eudaimonic well-being as the third aspect. Acceptance of change appears to be related to a great flourishing of eudaimonic well-being and, subsequently, be associated with a great cognitive reflection on global satisfaction with one's own life (Diener et al., 1985) for hedonic well-being and is related to meaning in life (Morgan and Farsides, 2009) for eudaimonic well-being. In this study, the perception of accepting change seems to be relevant, particularly in forms of eudaimonic well-being as functioning optimally, emphasizing self-expression and self-realization (Diener et al., 2010), and adherence to authentic meanings and values (Morgan and Farsides, 2009), but also with hedonic well-being, especially regarding life satisfaction, suggesting that being open to changes could be linked to various types of well-being.

Despite the results obtained, this study has some limitations that must be addressed. First, a limitation relative to the participants is that students in psychology at the University of Florence were predominantly female. Even if this composition of the group of participants tends to reflect the distribution of gender among psychology students, it remains a limitation of this study. Future studies should be conducted considering a better balance between males and females, as well as the inclusion of students from various disciplines and from other universities in Italy. Future studies could extend this study to different international contexts. A further limitation is that the study used self-reported measures. The cross-sectional design constitutes another limitation, suggesting a longitudinal approach for future research. Additionally, future research could consider studying these relationships in students attending high school as well as in other targets, such as workers. With this latter target, future studies could also investigate the acceptance of change regarding other specific aspects of well-being at work, such as job satisfaction (Judge et al., 1998) and work meaning (Steger et al., 2012).

Conclusion

If these results are replicated, new perspectives on intervention can be opened. The current complex, unstable, and detonating scenario (Blustein et al., 2019) is calling for strength to cope with change in a constructive manner, and to successfully face transitions and adversities, so that the well-being of individuals is not threatened. In this scenario, acceptance of change emerges as a promising resource. In fact, acceptance of change is amenable to training, contrary to personality traits, which are generally stable (Costa and McCrae, 1992). Thus, helping individuals face the transforming and mutable environments of the current century effectively (Di Fabio and Gori, 2016a) could be a resource for enhancing their well-being. According to strength-based perspectives, especially in a primary preventive approach (Di Fabio and Kenny, 2021), acceptance of change could be configured as a promising resource to respond to the challenges connected in particular to the third sustainable development goal, "Good health and well-being" (SDG 3). Furthermore, from these perspectives, early preventive actions on acceptance of change for university students could also address the challenges of decent education (Duffy et al., 2022) and decent work (Duffy et al., 2017; Di Fabio and Kenny, 2019; Svicher et al., 2022). Improving resources for change in young people as future workers in organizations (Di Fabio and Blustein, 2016) could promote decent work as the eighth sustainable development goal (SDG8). Early preventive actions enhancing acceptance of change could also better deal with the challenges relative to all other sustainable development goals (SDGs) for the promotion and establishment of a culture of sustainability and sustainable development.

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 Integrated Psychodynamic Psychotherapy Institute (IPPI). IPPI Ethical Committee Number 016/2022. The patients/participants provided their written informed consent to participate in this study.

Author contributions

ADF conceptualized the paper. ADF, LP, AB, AG, and AS contributed to the data collection. LP ran statistical analyses. ADF and LP wrote the first draft of the paper. ADF, AS, and AG edited and wrote the final draft of the paper. All authors contributed to the article and approved the submitted version.

Conflict of interest

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

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References

Bellini, D., Barbieri, B., Barattucci, M., Mascia, M. L., and Ramaci, T. (2022). The role of a restorative resource in the academic context in improving intrinsic and extrinsic motivation and flow within the job demands–resources model. *Int. J. Environ. Res. Public Health* 19:15263. doi: 10.3390/ijerph192215263

Blustein, D. L., Kenny, M. E., Di Fabio, A., and Guichard, J. (2019). Expanding the impact of the psychology of working: engaging psychology in the struggle for decent work and human rights. *J. Career Assess.* 27, 3–28. doi: 10.1177/1069072718774002

Caprara, G. V., Barbaranelli, C., and Borgogni, L. (1993). *BFQ: big five questionnaire. 2nd* Edn. Florence, Italy:Giunti O.S.

Costa, P. T., and McCrae, R. R. (1992). *NEO PI-R professional manual*. Odessa, FL: Psychological Assessment Resources.

De Giorgio, A., Barattucci, M., Teresi, M., Raulli, G., Ballone, C., Ramaci, T., et al. (2023). Organizational identification as a trigger for personal well-being: associations with happiness and stress through job outcomes. *J. Community Appl. Soc. Psychol.* 33, 138–151. doi: 10.1002/casp.2648

Di Fabio, A. (2014). *Meaningful life measure*: primo contributo alla validazione della versione italiana [*meaningful life measure*: first contribution to the validation of the Italian version]. *Counseling Giornale Italiano di Ricerca e Applicazioni* 7, 307–315. doi: 10.1037/t54712-000

Di Fabio, A. (2016). *Flourishing scale*: primo contributo alla validazione della versione italiana [*flourishing scale*: first contribution to the validation of the Italian version] counseling. *Giornale Italiano di Ricerca e Applicazioni* 9. doi: 10.14605/CS911606

Di Fabio, A. (2017a). Positive healthy organizations: promoting well-being, meaningfulness, and sustainability in organizations. *Front. Psychol.* 8:1938. doi: 10.3389/fpsyg.2017.01938

Di Fabio, A. (2017b). The psychology of sustainability and sustainable development for well-being in organizations. *Front. Psychol.* 8:1534. doi: 10.3389/fpsyg.2017.01534

Di Fabio, A., and Blustein, D. L. (2016). Editorial: from meaning of working to meaningful lives: the challenges of expanding decent work. *Front. Psychol.* 7:1119. doi: 10.3389/fpsyg.2016.01119

Di Fabio, A., Cheung, F., and Peiró, J.-M. (2020). Editorial special issue personality and individual differences and healthy organizations. *Pers. Individ. Diff.* 166:110196. doi: 10.1016/j.paid.2020.110196

Di Fabio, A., Giannini, M., Loscalzo, Y., Palazzeschi, L., Bucci, O., Guazzini, A., et al. (2016). The challenge of fostering healthy organizations: an empirical study on the role of workplace relational civility in acceptance of change, and well-being. *Front. Psychol.* 7:1748. doi: 10.3389/fpsyg.2016.01748

Di Fabio, A., and Gori, A. (2016a). Developing a new instrument for assessing acceptance of change. *Front. Psychol.* 7:802. doi: 10.3389/fpsyg.2016.00802

Di Fabio, A., and Gori, A. (2016b). Measuring adolescent life satisfaction: psychometric properties of the satisfaction with life scale in a sample of Italian adolescents and young adults. *J. Psychoeduc. Assess.* 34, 501–506. doi: 10.1177/0734282915621223

Di Fabio, A., and Gori, A. (2020). Satisfaction with life scale among italian workers: reliability, factor structure and validity through a big sample study. *Sustainability* 12:5860. doi: 10.3390/su12145860

Di Fabio, A., and Kenny, M. E. (2016). Promoting well-being: the contribution of emotional intelligence. *Front. Psychol.* 7:1182. doi: 10.3389/fpsyg.2016.01182

Di Fabio, A., and Kenny, M. E. (2019). Decent work in Italy: context, conceptualization, and assessment. *J. Vocat. Behav.* 110, 131–143. doi: 10.1016/j.jvb.2018.10.014

Di Fabio, A., and Kenny, M. E. (2021). Positive and negative effects and meaning at work: trait emotional intelligence as a primary prevention resource in organizations for sustainable and positive human capital development. In FabioA. Di (Ed.), *Cross-cultural perspectives on well-being and sustainability in organizations*. (Switzerland: Springer), 139–152.

Di Fabio, A., and Rosen, M. A. (2018). Opening the black box of psychological processes in the science of sustainable development: a new frontier. *Eur. J. Sustain. Dev.* 2:47. doi: 10.20897/ejosdr/3933

Di Fabio, A., and Rosen, M. A. (2020). An exploratory study of a new psychological instrument for evaluating sustainability: the sustainable development goals psychological inventory. *Sustainability* 12:7617. doi: 10.3390/su12187617

Di Fabio, A., and Rosen, M. A. (n.d.). Psychology of sustainability and sustainable development in organizations: empirical evidence from environment to safety to innovation and future research. In FabioA. Di and C. L. Cooper (Eds.), *Psychology of sustainability and sustainable development in organizations*. (New York, NY:Routledge Taylor & Francis Group). in press.

Di Fabio, A., and Saklofske, D. H. (2021). The relationship of compassion and self-compassion with personality and emotional intelligence. *Pers. Individ. Differ.* 169:110109. doi: 10.1016/j.paid.2020.110109

Diener, E. D., Emmons, R. A., Larsen, R. J., and Griffin, S. (1985). The satisfaction with life scale. *J. Pers. Assess.* 49, 71–75. doi: 10.1207/s15327752jpa4901_13

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., et al. (2010). New well-being measures: short scales to assess flourishing and positive and negative feelings. *Soc. Indic. Res.* 97, 143–156. doi: 10.1007/s11205-009-9493-y

Duffy, R. D., Allan, B. A., England, J. W., Blustein, D. L., Autin, K. L., Douglass, R. P., et al. (2022). The development and initial validation of the Decent Work Scale. *J. Couns. Psychol.* 64, 206–221. doi: 10.1037/cou0000191

Duffy, R. D., Kim, H. J., Perez, G., Prieto, C. G., Torgal, C., and Kenny, M. E. (2022). Decent education as a precursor to decent work: an overview and construct conceptualization. *J. Vocat. Behav.* 138:103771. doi: 10.1016/j.jvb.2022.103771

Gori, A., and Topino, E. (2020). Predisposition to change is linked to job satisfaction: assessing the mediation roles of workplace relation civility and insight. *Int. J. Environ. Res. Public Health* 17:2141. doi: 10.3390/su12197902

Helfrich, C. D., Kohn, M. J., Stapleton, A., Allen, C. L., Hammerback, K. E., Chan, K. G., et al. (2018). Readiness to change over time: change commitment and change efficacy in a workplace health-promotion trial. *Front. Public Health* 6:110. doi: 10.3389/fpubh.2018.00110

Jing, R., Lin Xie, J., and Ning, J. (2014). Commitment to organizational change in a Chinese context. *J. Manag. Psychol.* 29, 1098–1114. doi: 10.1108/JMP-08-2011-0042

Judge, T. A., Locke, E. A., Durham, C. C., and Kluger, A. N. (1998). Dispositional effects on job and life satisfaction: the role of core evaluations. *J. Appl. Psychol.* 83, 17–34. doi: 10.1037/0021-9010.83.1.17

Kahneman, D., Diener, E., and Schwarz, N. (Eds.) (1999). *Well-being: foundations of hedonic psychology*. New York, NY:Russell Sage Foundation.

Morgan, J., and Farsides, T. (2009). Psychometric evaluation of the meaningful life measure. *J. Happiness Stud.* 10, 351–366. doi: 10.1007/s10902-008-9093-6

Oreg, S. (2003). Resistance to change: developing an individual differences measure. *J. Appl. Psychol.* 88, 680–693. doi: 10.1037/0021-9010.88.4.680

Quigley, J., and Lambe, K., Moloney, T., Farragher, L., Farragher, A., and Long, J. (2022). *Promoting workplace health and wellbeing through culture change. An evidence review*. Health Research Board. https://www.hrb.ie/

Ramaci, T., Rapisarda, V., Bellini, D., Mucci, N., De Giorgio, A., and Barattucci, M. (2020). Mindfulness as a protective factor for dissatisfaction in HCWs: the moderating role of mindful attention between climate stress and job satisfaction. *Int. J. Environ. Res. Public Health* 17:3818. doi: 10.3390/ijerph17113818

Rosen, M. A. (2017). Sustainable development: a vital quest. *Eur. J. Sustain. Dev. Res.* 1:2. doi: 10.20897/ejosdr.201702

Ryff, C. D., and Singer, B. H. (2008). Know thyself and become what you are: a eudaimonic approach to psychological well-being. *J. Happiness Stud.* 9, 13–39. doi: 10.1007/s10902-006-9019-0

Seligman, M. E. P. (2002). "Positive psychology, positive prevention, and positive therapy" in *Handbook of positive psychology*. eds. C. R. Snyder and S. J. Lopez (New York: Oxford University Press), 3–9.

Seligman, M. E. P., and Csikszentmihalyi, M. (2000). Positive psychology: an introduction. *Am Psychol.* 55, 5–14. doi: 10.1037/0003-066X.55.1.5

Steger, M. F., Dik, B. J., and Duffy, R. D. (2012). Measuring meaningful work: the work and meaning inventory (WAMI). *J. Career Assess.* 20, 322–337. doi: 10.1177/1069072711436

Svicher, A., Di Fabio, A., and Gori, A. (2022). Decent work in Italy: a network analysis. *Aust. J. Career Dev.* 31, 42–56. doi: 10.1177/10384162221089462

Terraciano, A., McCrae, R. R., and Costa, P. T. Jr. (2003). Factorial and construct validity of the Italian positive and negative affect schedule (PANAS). *Eur. J. Psychol.* 19, 131–141. doi: 10.1027//1015-5759.19.2.131

Tetrick, L. E., and Peiró, J. M. (2012). *Occupational safety and health. The Oxford handbook of organizational psychology*. *2*. Oxford, UK: Oxford University Press.

Watson, D., Clark, L. A., and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *J. Pers. Soc. Psychol.* 54, 1063–1070. doi: 10.1037//0022-3514.54.6.1063

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Life design facing the fertility gap: promoting gender equity to give women and men the freedom of a mindful life planning

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Nowadays, society is characterized by enormous and rapid changes, erratic careers, gender discrimination, injustices, and inequities. Discrimination includes professional and educational segregation, the gender pay gap, stereotypical gender roles, and social expectations. In this context, phenomena called low fertility and fertility gap are increasing. Indeed, the birth rate necessary to ensure the replacement of the population is not reached, with severe repercussions at a social, environmental, and economic level. This study aimed to investigate 835 women's perceptions of the desire for motherhood and the associated difficulties. Hierarchical multiple regression and thematic decomposition analyses first highlight a significant difference between the number of children women realistically plan and the ideal number of children they would like. Secondly, the results showed how the parenthood choice is connected to the perception of social and gender inequity. Finally, in a Life Design perspective, preventive actions will be described to support women to get back to the center of life choices, building dignified fair paths and family projects.

KEYWORDS

fertility gap, gender equality, life design, Agenda 2030, social sustainability

1. Introduction: the social-economic context

A profound economic, health, and social crisis significantly impacted the labor market in the last decade. Italy fell into a robust recession: Italy's GDP for 2020 was $1,892.57B, a 5.9% decline from 2019; in 2019, it was $2,011.29B, a 3.86% decline from 2018, in which GDP was $2,091.93B, increased by 6.63% compared to 2017 (The World Bank, IBRID – IDA, 2023). During these years and in the last two decades, the current working context started to be qualified by a different organization of work and a high level of uncertainty. Fewer stable job positions corresponded to a higher number of flexible, temporary, and precarious jobs (Rubery and Piasna, 2017), with temporary, part-time, or casual (so-called "zero-hours") contracts. Workers must frequently face different professional transitions (Savickas et al., 2009). Due to this marked economic recession in Western society, job losses increased drastically, especially for women and youth, influencing their ability to design their professional and personal lives. Nowadays, the number of women in the occupational field is inadequate. In 2022, for most countries, women marked a higher unemployment rate than men: the European unemployment rate for women was 6.4%, higher than the rate for men, which was 5.8%. In 2021 in Italy, the women's unemployment rate was 11.26%. Besides, almost half of the employed women in the

EU in 2022 were working part-time (47%), nearly two times the rate for men (26%) (OECD, 2021; Eurostat, 2023). Given the higher employment rates of women in more vulnerable contract forms, women experienced lower forms of social protection, such as maternity benefits and unemployment benefits, and lower pensions (International Labour Organization, 2017). The characteristics of the current labor market, high unemployment rates, and extreme precariousness could be considered professional barriers that hinder the possibility of achieving professional, personal, and life aims (Swanson and D'Achiardi, 2005). These barriers and the considerable uncertainty facilitate in people the idea that the future will be unstable and economically unsatisfactory without the possibility of planning personal growth. Indeed, the increase in the unemployment rate reduces the chance of personal development and achievement of one's aspirations, particularly for youth and women (Evans and Gibb, 2009). For this reason, youth and women consider their professional life related to a higher level of vulnerability, which makes it difficult for them to find meaning in work. In addition, despite several laws that support the female presence in the labor market, women must face a series of external barriers (e.g., discrimination in the work context, gender stereotypes, etc.) and internal ones (e.g., the managing of family work and multi-role conflict, etc.) (Swanson and D'Achiardi, 2005; Betz, 2006). Considering the external barriers, women undergo discrimination, such as the gender pay gap (Pascall, 2008) and inequity in promotions. On average, working women in the EU earn 13% less per hour than men – 4.2% in Italy - although they have the same competence as male colleagues (Eurostat, 2020). In the world of work, men tend to choose other men for responsibility roles and higher positions, slowing the progress of women (Lundberg and Stearns, 2019). Indeed, there is a form of vertical segregation – the glass ceiling - a phenomenon for which it is complicated for women to reach the top positions (Ryan and Haslam, 2005). For example, in 2021, only 30.6% of board members in the EU's most prominent companies were women (European Institute for Gender Equality (EIGE), 2022). This phenomenon is explained by some co-optation processes, such as using different judgments because of gender belonging: women are often considered less competent than men (Gilrane et al., 2019). The interiorization of this process negatively influences women's perception of being able to build a career or achieve professional goals. Therefore, women tend to review their professional projects with some stopgap professional activities or an early exit from work for inactivity (Van der Lippe and Lippènyi, 2020). Among the external professional barriers, it is also possible to include occupational gender stereotypes that lead to expectations about professional roles that men and women should assume because they are biologically male and female (Ellemers, 2018). Women are described as warm and caring - traits associated with loving, educational, and nursing jobs - while men are defined as competent and determined, ideal for leadership positions (Haines and Stroessner, 2019). These stereotyped beliefs penalize women, limiting their access to traditionally male occupations with greater social prestige, remuneration, and career prospects (OECD, 2021). Indeed, these stereotypes accentuate the association between specific professional categories and gender belonging, influencing the choice of an appropriate path for each gender (Gysbers et al., 2009). All the external barriers have an impact on the internal ones. For instance, tracing back to the stereotypes associated with genders, women are considered primarily responsible for caring for the home and family (Camussi et al., 2021). Most women are socialized from an early age to be wives and mothers, accountable for the care of the house and devoted to their offspring, thus causing female workers to experience more significant work-home conflict (Piccitto, 2018). The difficulty of reconciling work and family responsibilities – one of the internal barriers - constitutes a substantial obstacle to gender equity (Suk, 2010). It negatively affects women's personal and professional well-being and their freedom to design and build their future careers and life (Kulik et al., 2016). Although the differences between partners in the domestic workload have diminished in recent years, a significant gender gap continues to exist. Indeed, it is possible to talk about the "triple presence of women": employed in their career (first), occupied with taking care of the home (second), and caring for children and elderly parents (third). All these barriers put women in the condition to make a decisive choice between their family aspirations and careers. On the one hand, motherhood often pushes women to change jobs, decrease workplace hours, or give up their working life because of increased stress and emotional exhaustion (Burke et al., 2012). On the other hand, women who struggle with responsibilities and work commitments can reconsider own and couples' reproductive choices.

2. Low fertility and fertility gap in Italy

According to the most recent data ISTAT (2019), Italy is living through a new demographic decline started in 2015. For instance, on the 31st of December 2019, with a population of 60,244,639, of which 8.8% were foreigners, the resident population was almost 189 thousand units lower (188,721) compared to the beginning of the year. Indeed, 2019 was one of the years with the lowest number of births recorded since 1946, caused by a slight increase in deaths and an increase in registry cancellations to emigrate abroad (+8.1%). Furthermore, if migratory flows previously mitigated this shortage, today the foreign population's growth rate is decreasing (−8.6%). Low fertility relates to the concept of the "replacement rate," which is the natural replacement capacity of the population. If the reproductive rate equals 1, a woman will only replace herself. Still, to maintain constant demographic growth, it is necessary to maintain a balance between birth and mortality. For this reason, the number of births must be higher than that of deaths. Considering a slightly higher number of male children, a suitable replacement rate occurs only when the number of children is at least equal to 2.1 for each woman (Corchia, 2016). This data does not apply to most Mediterranean countries, such as Italy. Indeed, in 2021 the Italian replacement ratio was equal to 1.25, highlighting the imbalance between births and deaths (ISTAT, 2022a). Italy has already experienced periods of prolonged demographic decrease in the past. It happened in the post-World War II period between 1947 and 1951; it also occurred in the 1970s, following the "baby boom," and lasted until 1995. The worst demographic decrease was recorded during this period, followed by an apparent quiet time marked by some signs of recovery. Then in 2008, the economic and financial crisis, in conjunction with other structural components of the population of childbearing age, interrupted the positive trend (Blangiardo, 2020). An analysis of the data issued by ISTAT in recent years reveals a continuous and constant decrease in the population

(ISTAT, 2022b). The lowest value of natural replacement deficit between births and deaths since the Unification of Italy (1861) was recorded in 2020. Before this year, the lowest value occurred in 1918 (−648,000), caused by the Spanish epidemic (ISTAT, 2021c). In 2020, alongside complex factors responsible for the population decrease, the Covid-19 pandemic was added, accentuating the demographic recession trend already underway (ISTAT, 2021c). Starting from February 2020, the impact of the Covid-19 pandemic and lockdown restrictions on the population's reproductive choices must also be considered. A climate of fear and uncertainty was established, causing postponements in couples' intentions to have children and accelerating the already declining trend in population dynamics since 2008 (Blangiardo, 2021). The effects of the Covid-19 epidemic occurred mainly in November and December 2020 due to conceptions registered during the lockdown period and the early months of the epidemic wave. Thus, the lockdown restrictions affected parenting couples who decided to postpone parenthood. These effects continued into the first months of 2021: the number of children conceived during the lockdown period, born in January and February, dropped further. March saw a reversal of the trend, with a 3.7% increase in births compared to the previous year, thanks to conceptions between the two pandemic waves of 2020. This change can be attributed to a calmer transition phase characterized by the illusory perception that the epidemic emergency was over (ISTAT, 2021a). Unfortunately, however, it turned out to be a positive trend that only lasted for a few months and collapsed between June (−5.9%) and July (−5.8%), about 9 months after the second pandemic wave (ISTAT, 2021b). From August, the contraction of pregnancies seemed less marked; between November and December, the first signs of recovery emerged, recording a consistent number of births (respectively +6.8% and + 13.5%) (ISTAT, 2022a). This trend analysis could suggest that women's desire for motherhood diminished, following the decline in the birth rate. Nevertheless, according to the available data, the average number of children that parents desire is higher than the fertility rate and exceeds the replacement rate (ISTAT, 2015). Indeed, the ideal number of children an individual would like to have under ideal living conditions (Lutz et al., 2006) equals 2.3. This difference between the desire to have more children and the actual number of children conceived at childbearing age (considered between 19 and 45 years) is called the fertility gap (CHESNAIS, 2000). It could be interpreted as an unmet need for fertility and as women's uncertainty in their intentions due to dependence on unstable and constantly changing contexts and circumstances.

3. 2030 Agenda for sustainable development and low fertility

Looking closely at the 17 Sustainable Development Goals identified in the UN's 2030 Agenda (2015) is possible to find several goal targets that lead to address low fertility and the fertility gap. Indeed, the fertility gap poses significant challenges to present and future sustainability. In OECD's Italy Governance Scan for Policy Coherence for Sustainable Development (2021), low fertility is indeed highlighted by most Italian regions and cities as one of the biggest challenges for building a sustainable future, together with climate change. Venetian Association Sustainable Development, Forum di Limena (2019) claims that "Demographic sustainability is a transversal theme to the Sustainable Development Goals of the 2030 Agenda, even if it has not yet fully entered the sustainability strategies at international and national/regional levels." Moreover, at an international level, addressing the low fertility and fertility gap is also central for European Union politics for sustainability, as testified by the publication in 2021 of a Green Paper on the topic (European Commission, 2021). These themes are analyzed through the lens of sustainability and well-being throughout the whole life cycle. This leads to the identification of 3 areas of intervention, in the training, working and retirement years, also considering the emerging needs deriving from a constantly growing number of elderly people. Using this lens of analysis, a clearer nexus appears between the 17 SDGs and the opportunity and necessity of addressing low fertility and fertility gap issues in a lifelong, Life Design-driven (Savickas et al., 2009) perspective. Among the others, this contribution highlights the close and mutual relationship between addressing the fertility gap and: (a) Goal 5, "Gender Equality"; (b) Goal 8, "Decent Work and Economic Growth." (a) The persistent social and cultural problem of unpaid domestic work, as well as the inequitable and restricted access to sexual and reproductive health, are closely related to a decrease in parenthood planning and mostly strike women worldwide. Target 5.4 (recognizing and valuing unpaid care work and domestic work, promoting shared responsibility within the household) and 5.6 (ensuring universal access to sexual and reproductive health and reproductive rights) are specifically dedicated to this. (b) A demanding work-life balance, as long as the absence of correct job retribution hinders people's ability to plan and enact parenthood. The perceived difficulty of making ends meet and finding time for yourself makes it more difficult to even think about having children. Target 8.5 (achieve decent work for all women and men, including for young people and people with disabilities, and equal pay for work of equal value) addresses this issue.

4. Life design paradigm

Therefore, in such a scenario, in which addressing the fertility gap and low fertility demand the parallel consideration of multiple social and economic factors of complexity, it may be helpful to refer to the Life Design paradigm (Savickas et al., 2009). This approach was born to respond to the rapid social and cultural changes and crises that have strongly impacted people's lives, choices, and economic and social possibilities in the 21st century. Nevertheless, Life Design Career Guidance supports people facing complexity, fostering their ability to adapt and be ready to anticipate and face change and unpredictability (Savickas, 2012). Life Design focuses on developing transversal skills and resources for constructing life and career trajectories in line with personal desires, satisfaction, and well-being. This paradigm is proposed as an essential element of protection and prevention from inequality dynamics, as a means to foster the acquisition of awareness of one's own resources and skills in order to create one's own path facing the world's complexities and challenges. Developing these resources can be fostered through specific training proposed by the paradigm. Therefore, career guidance interventions in the Life Design

perspective start from reconstructing individuals' personal stories and experiences. This process contributes to constructing a more hopeful and optimistic vision, considering reality's constraints and acknowledging the resources needed to face as well as deconstructing the irrational and stereotypical ones. To do so, Life Design interventions aim at developing people's skills to resist, persevere and adapt to a complex world (Guichard, 2018). This framework is therefore structured to be life-long, holistic, contextual, and preventive (Savickas, 2012). It is emphasized that the Life Design paradigm adapts to people of all ages and life stages, suggesting a way of valuing needs, desires, and skills to make more effective choices. In line with this, in the Life Design perspective, particular emphasis is placed on critical dimensions useful for guiding one's life design, especially in crucial moments of change, such as changing or finding a job and transitioning to parenthood, facing the related challenges they may present. These dimensions are career adaptability, optimism, hope, life satisfaction, and resilience (Ginevra et al., 2018, 2020). From a Life Design perspective, values and skills constitute the guide and tool to deal with change and adaptation to new needs and integrally involve the individual, calling him/her to use cognitive, affective, and behavioral components. Moreover, these dimensions allow for better adaptation in life's most essential decision-making phases. Their development can be effective and functional in the re-construction and co-construction of people's personal and/or professional trajectories (Savickas, 2012). In line with the Life Design Approach, the aim of this paper is to put women and couples back at the center of life choices, building decent and equitable paths and projects for all.

5. Goal of the study

Starting from the previously analyzed literature, it is evident that women's attitude towards motherhood can no longer be the only aspect to explain the low fertility and fertility gap. It is increasingly essential to investigate other factors. Indeed, according to Bachrach and Morgan (2013), to better understand the reasons for the fertility gap is crucial to investigate the relationship with the economic and social factors of a country. Such as it is vital to consider both competing goals (education, work, and leisure) and adverse circumstances (unemployment rate; Bongaarts, 2001). Moreover, while motherhood attitudes have been frequently studied, some areas of the fertility gap still need to be better understood, and additional research is required. For instance, considering the Italian context, the last data and report about the ideal number of children are from 2015. For this reason, based on the Life Design approach for social and gender equity, the general goal is to analyze the psychological and social motivations for the fertility gap, exploring the difficulties of parenthood planning in a context characterized by gender discrimination and social-economic uncertainty. In particular, considering the literature presented and the necessity to update data and to enlarge the perspective on the fertility gap, the specific goals will be (a) to observe if the differences between the ideal number of children and the number of children actually expected still exist in Italian women; (b) to observe at which age women want the first child; (c) to intercept which aspects can influence the parenthood planning process, focusing on the perception of personal values (internal barriers), and social uncertainties (external barriers); (d) to analyze the relationship between the process to plan a child and the perception of gender stereotype and the motherhood pressure on women.

6. Materials and methods

6.1. Participants

Participants in the study were 835 Italian women. Three hundred and twenty-four participants (4%) were below 24 years old, and 288 participants (34.5%) were between 25 and 29 years old. The second largest range is from 30 to 34 years old, with 130 participants (15.6%). From 35 to 39 years, there are 51 participants (6.1%); from 40 to 44 years old, there are 14 (1.7%), and finally, from 50 to 54 and from 55 to 59 years old, we find, respectively, 7 and 3 participants who together, correspond to 1% of the sample. Concerning schooling levels, 20 have a secondary school leaving examination (2.4%), 332 have a high school leaving examination (39.8%), 241 have a first degree (28.9%), 169 have a master's degree (20.2%), 43 have a postgraduate specialized master's (5.1%), 15 a Ph.D. (1.8%) and 15 subjects selected the "other" option (1.8%). Most of the women (630 participants - 75%) declare themselves unmarried, 96 married (11.5%), 13 divorced (1.6%), 94 select "other" relationship (11.1%), only one is widowed, and two participants prefer not to answer this question. Four hundred and seventy-six women (57%) are employed, while 359 (43%) are not.

6.2. Procedure

A snowball sampling procedure (Goodman, 1961) was used to engage the adult women, sharing the questionnaire multimedia link with them. In particular, most of the women were recruited by disseminating the link *via* the social network Instagram, thanks to two public profiles that made the questionnaire link visible and accessible. Before starting, all the participants read the explanation of the project's goals, the privacy information, and the professional confidentiality declaration. All the participants gave informed consent. The study was conducted following the ethical procedures of the Italian Society for Vocational Guidance (SIO), in line with the "Declaration of Helsinki" and the Oviedo Convention. In particular, the research was approved by the Ethical Committee of Milano-Bicocca University. All participants were obliged to answer all the items. The entire questionnaire lasted approximately 30 min.

6.3. Measures

6.3.1. Attitudes toward women and motherhood scale

This scale (Holton et al., 2009) aims to measure attitudes about women's roles, responsibilities, and expectations related to motherhood. It consists of 18 items for three factors. The first factor refers to the vision of motherhood as normative; an example of an item is "It is selfish not to have kids." The second factor concerns women's roles and responsibilities, such as "A high level of education is more important for a man than a woman." The last factor measures beliefs regarding motherhood in the Italian context, such as "In Italy,

women are seen more favorably if they have children." Each item is rated on a five-point Likert scale, ranging from strongly agree (1) to strongly disagree (5). The subscale of particular interest in the present study is the third one, regarding beliefs about motherhood in the Italian context. In the present study, Cronbach's alpha for the last scale corresponds to 0.70.

6.3.2. Career barriers inventory

The original scale (Swanson et al., 1996) consists of a 5-Likert scale of 70 items divided into thirteen scales investigating potential barriers people may encounter in their careers. In the questionnaire examined, a reduction of the CBI scale was used, with the same factor structure but composed of 39 items that explore the following barriers:

- Sex discrimination, a scale initially composed of seven items addressing different aspects of discrimination, including economic barriers in the workplace (e.g., "Being paid less than colleagues of the opposite sex from me")
- Multiple role conflict, assessed by eight items (e.g., "Experiencing stress at work that could affect family life")
- Conflict between children and work demands, scale initially composed of seven items (e.g., "Feeling guilty about going to work when the children are young")
- Disapproval by significant others consists of three items on disapproval caused by one's job and career choice (e.g., "Having a partner who does not approve of my career choice")
- Discouragement from choosing non-stereotypical careers, composed of five items (e.g., "Feeling discouraged from undertaking professional activities that are traditionally not considered appropriate for one's gender e.g., mechanical professions for women, educational professions for men")
- Constraints of the labor market, four items (e.g., "Recognize that there are few possibilities of job placement in the professional sector for which you have trained")
- Difficulty with networking or socializing, consisting of five items (e.g., "Not knowing the 'right people' to advance in one's profession").

Considering the goal to investigate the influence of gender stereotypes, the subscale of particular interest in the present study is "Discouragement from choosing non-stereotypical careers." For this sample, Cronbach's alpha for this scale is 0.78.

6.3.3. Portrait values questionnaire – PVQ

The PVQ (Schwartz et al., 2001) is a scale composed of 40 items, which indirectly measure the participants' values through judgments of similarity with another person concerning goals and aspirations. The scale is a 5 points Likert scale ranging from 1 ("very similar to myself") to 6 ("not at all similar to myself "). The ten types of values identified by Schwartz are (a) *Power*: social status and prestige, control or dominion over people and resources (e.g., "He likes to be in charge and tell others what to do. He wants people to do what he says."); (b) *Achievement*: personal success through demonstration of competence according to social standards (e.g., "Being very successful is important to him. He likes to stand out and to impress other people."); (c) *Hedonism*: personal pleasure and sense of gratification for oneself (e.g., "He really wants to enjoy life. Having a good time is very important to him."); (d) *Stimulation*: Excitement, novelty, and challenge in life (e.g., "He looks for adventures and likes to take risks. He wants to have an exciting life."); (e) *Self-direction*: independent thought and action - choose, create, explore (e.g., "He thinks it's important to be interested in things. He is curious and tries to understand everything."); (f) *Universalism*: understanding, appreciation, tolerance, and protection for the well-being of all people and nature (e.g., "He thinks it is important that every person in the world should be treated equally. He wants justice for everybody, even for people he does not know."); (g) *Benevolence*: preservation and improvement of the well-being of people with whom one is in frequent personal contact (e.g., "He always wants to help the people who are close to him. It's very important to him to care for the people he knows and likes."); (h) *Tradition*: respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provides to the self (e.g., "He thinks it is important to do things the way he learned from his family. He wants to follow their customs and traditions."); (i) *Conformity*: containment of actions, inclinations, and impulses that might upset or harm others and violate social expectations or norms (e.g., "He believes that people should do what they are told. He thinks people should follow rules at all times, even when no one is watching."); (j) *Security*: safety, harmony, and stability of society, relationships, and oneself (e.g., "The safety of his country is very important to him. He wants his country to be safe from its enemies.").

In the present study, Cronbach's alpha for the scales are: Power: 0.75; Achievement: 0.80; Hedonism: 0.69; Stimulation: 0.68; Self-direction: 0.62; Universalism: 0.66; Benevolence: 0.76; Tradition: 0.64; Conformity: 0.62; and Security: 0.64.

In addition to using the scientifically validated scales reported above, some open questions were formulated in line with the research goals. The topics explored are as follows:

- Thinking about your future, how many children would you realistically want to have?
- Thinking about your future, how many children would you like to have if you had a magic wand? Could you explain the reason for this choice?
- At what age would you like to have your first child? Could you explain the reason for this choice?

7. Data analysis

As suggested by Leech and Onwuegbuzie (2009), a mixed-methods design was chosen to achieve the different goals of the study. A quantitative procedure was used to test the relationship between the number of future child planning, personal values, and the perception of gender stereotypes. Quantitative data analyses were performed using IBM SPSS Statistics (Version 28). Secondly, the qualitative analysis was considered more appropriate to explore women's motivations for planning or not to start a family, with a paper/pencil method. First, all study variables' means, standard deviations, and Pearson correlations were carried out. Then, one hierarchical multiple regression analysis (Stone-Romero and Anderson, 1994) was carried out to determine the effect of women's socio-demographic variables (age, schooling, and marital status), personal values (Power, Achievement, Hedonism, Stimulation, Self-direction, Universalism, Benevolence, Tradition, Conformity, Security), and stereotypical factors (Beliefs regarding motherhood in the Italian context and

Discouragement from choosing non-stereotypical careers) on the number of realistically planned children. For the hierarchical multiple regression analyses, in step 1 of the regression model, women's socio-demographic variables were entered. In step 2, personal values were added. Finally, the stereotypical factors were entered in step 3. The "thematic decomposition analysis" (Ussher and Mooney-Somers, 2000) was used for the qualitative data analysis. This approach considers language as constitutive of meanings and the construction of meanings as the outcome of social processes. It is based on the research of themes emerging from the data. According to Braun and Clarke (2006) procedural indications, the coding labels were assigned after familiarization with the data. These were then transformed into 'thematic categories' by identifying the relationships between the different codes. This phase was followed by the return to the original transcripts, according to: "a constant moving back and forward the entire data set, the coded extracts of data that you are analyzing, and the analysis of the data that you are producing" (Braun and Clarke 2006, page 15).

8. Results

Regarding our goal a, the following table shows the number of children women realistically plan and the ideal number of children they would like (Table 1). In addition, addressing our goal b, the age at which they want children was analyzed. Considering women that want at least one child, only 1% want them before 25 years old; 21.8% want them between 26 and 30 years old, the 38% want some children between 31 and 35 years old. From 36 years old to 40 years old, 7.2% of women want a child, and only 0.9% want a child after 41 years old. Correlations for all the variables are in Table 2.

Considering our goal c from a quantitative perspective, the hierarchical multiple regression showed that Model 1 with women's socio-anagraphic variables was significant ($\Delta R^2 = 0.076$, $p \leq 0.001$). Specifically, only the variable "age" negatively influences the number of realistically planned children, as reported in Table 3. All the other socio-anagraphic variables were found to be not significant. Moreover, about our goal c, model 2 with the women's personal values was significant ($\Delta R^2 = 0.133$ <0.001). Specifically, the value of Tradition and Universalism positively predicted the number of realistically planned children. On the other hand, the value of Self-direction and Benevolence negatively predicted the number of realistically planned children. All the other values were found to be not significant. Regarding our last goal (goal d), Model 3 testing the perception of gender stereotypes was significant ($\Delta R^2 = 0.146$, $p \leq 0.05$). Specifically, both Beliefs regarding motherhood in the Italian context and Discouragement from choosing non-stereotypical careers negatively predicted the number of realistically planned children.

Analyzing the qualitative data, to get deeper and multimethodological insight about our goals c and d, the motivation for having zero or at least one child was examined. In Table 4, it is possible to see all the categories. These categories are considered non-exclusive, as the same participant in his answer could refer to different motivations. Several women cannot really explain the reason for their parenthood planning (18.3% answers), and some women recognize personal reasons (21.4% answers) as the most important for having zero or one child. In this category, it is possible to consider, "Women do not like children (2.7% answers)" and the fear connected to the physical experience related to childbirth (3.1% answers about fear of the labor and 2.4% answers about the changes in the body). Several women do not want any child because they do not consider themselves good enough (9.5% answers), especially considering the enormous responsibility that a child implicates (3.7% answers). Most women refer to some social and contextual motivation (51.3% answers). First of all, the absence of the State, that does not support and does not offer services to help women to consider this choice (7.8% answers). In this context, women report having to choose between personal freedom or the freedom to have a career (9.2% answers) or having a child. In addition, some of women communicate that they – or their couple - do not have enough money to raise a child (13.6% answers), especially considering a perception of economic certainty. Moreover, some of them (13.6%) describe several phenomena connected with the specifically female condition: work-life balance, stereotypes, discrimination, etc. The perception of this external barrier is considered a high hurdle to the decision to have a child. Finally, some women (7.1% answers) report as relevant the characteristics of the global context: overpopulation, inequality, and climate change.

9. Discussion

This paper considers the process of the fertility gap and birth rate from a psychosocial perspective. Therefore, it highlighted the relevance of the Life Design approach to better comprehend the factors involved in these issues and foster sustainable and equal

TABLE 1 Frequencies of women that realistically and ideally plan child/children.

Number of children	Frequency of women that realistically planned	Percentage of women that realistically planned	Frequency of women that ideally wanted	Percentage of women that ideally wanted
0 Child	260	31.1%	168	20.1%
1 Child	95	11.4%	63	7.5%
2 Children	323	38.7%	307	36,8%
3 Children	142	17.0%	210	25.1%
4 Children	13	1.6%	56	6.7%
5 Children	1	0.1%	16	1.9%
More than 5 children	1	0.1%	15	1.8%

TABLE 2 Correlations among the number of children women realistically planned, values, and stereotypical factors.

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Number of children women realistically planned	1	0.007	0.023	−0.010	0.019	−0.087*	0.095*	−0.047*	0.169**	0.132**	0.074*	−0.120**	−0.088*
2. Power		1	0.657**	0.182**	0.359**	0.290**	−0.045	−0.025	−0.032	0.092**	0.229**	0.018	0.065
3. Achievement			1	0.237**	0.380**	0.352**	0.143**	0.138**	−0.027	0.200**	0.308**	0.059	0.062
4. Hedonism				1	0.262**	0.374**	0.220**	0.215**	0.063	0.094**	0.142**	−0.012	0.025
5. Stimulation					1	0.460**	0.230**	0.244**	−0.015	−0.043	0.089*	−0.017	0.118**
6. Self-direction						1	0.279**	0.395**	−0.043	0.002	0.196**	0.131**	0.081*
7. Universalism							1	0.455**	0.241**	0.266**	0.189**	−0.018	0.069*
8. Benevolence								1	0.092**	0.173**	0.308**	0.126**	0.085*
9. Tradition									1	0.476**	0.294**	−0.205**	0.160**
10. Conformity										1	0.428	−0.067	0.087*
11. Security											1	0.021	0.173**
12. Beliefs regarding motherhood in the Italian context												1	0.022
13. Discouragement from choosing non-stereotypical careers													1

*$p < 0.05$; **$p < 0.01$.

personal and parental planning for women and men. The context of reference for the analysis proposed is the Italian one, that like and more than others, is marked by gender asymmetries and disparities in all spheres (private, public, personal, family, professional, social, political) (Eurostat, 2020; OECD, 2021; ISTAT, 2021a,b,c). The permanence of gender stereotypes in the female and male population, the presence of gender violence, the low presence of women in the labor market, the lack of social infrastructure and personal services, and the persistence of a family welfare model, which offloads the reconciliation of lifetimes onto women, give rise to various consequences. These consequences include the voluntary renunciation of paid work, as well as a constant difference between the number of children desired and those had. As shown by this study's results, according to our goal a (to observe if the differences between the ideal number of children and the number of children actually expected still exist in Italian women), it is possible to confirm Italian women's desire to have at least 2 children (ISTAT, 2015) which is not met, often because of bad contextual social and economic conditions. Added to this is the growing poverty of women and the persistence in Italy and all over the world of organizational models that reward availability "without time limits." It is hence possible to observe, especially in highly educated and STEM fields, the strengthening of "all time-consuming" professions, which seem unlikely to include possibilities for a sustainable "work-life balance" (Camussi et al., 2022). Faced with this situation of barriers and enduring inequality, an important part of the adult female population is comprehensibly reacting with an attitude of resigned, passive acceptance of reality as it is. As shown by this study, women are therefore not willing to give birth to children in a world that is making them struggle socially and economically (as we inquired according to our goal c, to intercept internal and external barriers influencing parenthood planning process). Moreover, from a psychological point of view, it is not unusual that those who experience greater disadvantage in the social context are the ones ending up believing the reality they experience to be just and acceptable. It would be too painful and destabilizing to simultaneously recognize the world both as unfair and extremely resistant to change (Camussi et al., 2021). Therefore, after taking into consideration these complex factors and their implications, in line with 2030 Agenda Goals 5 and 8, one of the main aims must be to identify and remove the obstacles that do not allow women and men to realize their parenthood planning. As highlighted by this study's results, considering our goals c (internal and external barriers vs. parenthood planning) and d (gender stereotypes and parenthood pressure vs. parenthood planning) implementing interventions involving the multiple levels that compose the complex challenge of the fertility gap would not only benefit birth rates (Nie et al., 2019). Given that both gender equity and decent work themes are to be considered, it would create the conditions to increase individual and community well-being as long as social sustainability. Therefore, as the results of this study show, it would

TABLE 3 Hierarchical Multiple Regression analyses predicting the number of realistically planned children.

Predictor	$\Delta R^2\beta$
Step 1	0.076**
Women's age	−0.286**
School grade	0.034
Marital status	0.250
Step 2	0.133**
Power	−0.046
Achievement	0.052
Hedonism	0.043
Stimulation	−0.049
Self-direction	−0.143*
Universalism	0.133*
Benevolence	−0.172*
Tradition	0.186*
Conformity	0.041
Security	0.073
Step 3	0.146*
Beliefs regarding motherhood in the Italian context	0.028*
Discouragement from choosing non-stereotypical careers	0.054*

**$p < 0.001$; *$p < 0.05$.

be useful to focus on the issue of gender equity, which still negatively influences women's satisfaction and their parenthood planning (goal c and d). Actions that can be implemented to promote gender equity may consist of encouraging practices that support the enhancement of women's potential and resources, as well as men's. At the same time, through preventive career guidance actions, it is necessary to implement the personal and social resources of individuals and couples, so that they can support people in the processes of re-construction and co-construction of their personal trajectories. The goal of these interventions should therefore be to bring women and couples back to the center of their life choices, building decent, viable and equitable pathways and projects for all. In line with scientific literature, this work shows that adopting a Life Design approach can help individuals navigate the challenges of sustainable parenthood by fostering intentional decision-making and purposeful action in various domains of life. By integrating sustainability principles and practices into their life design, individuals can contribute to a more sustainable and just future for their children and future generations (Greco et al., 2022). Life design interventions can help women and men balance the demands of sustainable parenthood and personal well-being (Camussi et al., 2021). For instance, to match the fertility gap, Lappegård (2020) proposed to intervene in adults by developing adaptive coping strategies to balance the competing demands of work, family, and sustainability goals, as well as addressing gender stereotypes. In fact, Suero (2023) found an inverse relation between Spanish women willing to have a second child and a stereotypical gendered division of housework. There is, therefore, a need to implement interventions aimed at reducing the impact of barriers (external and internal) on women's life design and motherhood planning and at the same time able to raise society's awareness on social issues, towards real cultural change. Young and older women should be supported to develop resources and seek social support that can enable them to achieve their goals. Therefore, it would be useful to promote social awareness about gender barriers and changes in the living and working environment, building viable solutions through the involvement of the entire community of experts and citizens. In conclusion, after considering all the multiple factors involved in the widespread phenomenon of low fertility, it is necessary to remove the existing obstacles to allow men and women to fulfill their family and life plans. Therefore, it is necessary both nationally and internationally to implement policies to support the birth rate, offering to parental couples guarantees on several fronts. The starting point should be the knowledge of the phenomenon to raise awareness among the population, including interventions on cultural factors and actions to support families to facilitate work-life balance. Faced with this extremely complex context, this research can inspire and p ositively influence possible new interventions to be implemented to improve quality of life and promote well-being and sustainable life planning of a single category of people and the entire community.

10. Limitations and future research perspective

Although some interesting results emerged, this study presents some limitations. One possible limitation of the research may relate to the self-report questionnaire. It may be unreliable and subject to systematic biases such as deception and social desirability. Indeed, despite the anonymity, participants may have responded according to what society considers acceptable and appropriate, especially given the high sensitivity of the topic. Concerning the use of open-ended questions, some limitations can also be noted in the qualitative section of the research. People tend to show only some aspects of themselves, while interviews or closed questions allow in-depth explorations. Starting from these limits, future directions of research can be identified. Firstly, the research could be expanded to be more consistent and representative of all genders and the Italian population. Furthermore, controlling the geographical belonging, possible variations in results between different geographical areas characterized by dissimilar socio-economic developments and welfare policies could be analyzed. In addition, the research could also be extended to a male sample; this would make the sample more balanced and representative, also allowing a comparison between genders. Finally, future research could be accompanied by semi-structured interviews to further explore specific topics and capture even the most implicit aspects of the responses.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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TABLE 4 Type of motivation to not have a child or not to have more than one.

Categories	Examples	Frequency
I do not want them	"I never wanted them. I do not care to have them" (N. 347)	18.3%
	"I do not want any children" (N. 322)	
Do not like children	"I do not like children" (N. 52)	2.7%
	"I do not like children, and I do not have a maternal sense" (N. 635)	
Fear of the deliver	"Because I do not want to give birth" (N. 525)	3.1%
	"Fear of labor." (N. 186)	
The changes in the body	"It is a physical discomfort" (N. 425)	2.4%
	"I am afraid of my body changing" (N. 373)	
Not feeling to be a good mother/good enough	"I do not feel capable of raising and educating a child"	9.5%
	"I love children, but I do not think I would be able to raise one" (N. 123)	
Too much responsibility	"Too much responsibility and commitment" (N. 107)	3.7%
	"Responsibility"(N. 822)	
A generic absence of the State	"I do not have the necessary means and the necessary support from the state" (N. 678)	7.8%
	"I do not live in a country that would allow me to balance family and career" (N. 503)	
Loss of freedom	"Because I am a bit selfish and I want more time for myself" (N.726)	9.2%
	"I still want to have the freedom that people without children have" (N. 507)	
Lack of economic security	"Because I like children, but you need money to raise one" (N. 85)	13.6%
	"I do not think I can afford to support economically more than one child" (N. 48)	
	"There is no money" (N. 380)	
Female condition	"Considering the socio-economic context of the country and the condition of women, a woman is even more convinced that she does not want them" (N. 94)	13.6%
	"I think that being a woman, I could not decide to have a career and be a mother at the same time. If I were a man, I would have a different opinion" (N. 440)	
	"Work-Life Balance!" (N. 752)	
	"Gender Stereotypes" (N. 195)	
Environmental, and ethical choice	"I would rather adopt because we are already on an overpopulated and exhausted planet. (N. 70)"	7.1%
	"They would have a horrible life due to the climate crisis and the collapse of ecosystems (N. 77)"	
Other	"I do not know" (N. 325)	9.2%
	"Why yes?" (N. 408)	
	"/" (N. 235)	

Ethics statement

The studies involving human participants were reviewed and approved by Research Commission of the University of Milano Bicocca. The patients/participants provided their written informed consent to participate in this study.

Author contributions

ECam: coordination (lead), conceptualization (equal), and review and editing (supporting). DM: conceptualization (equal), writing – original draft (equal), and writing – review, and editing (supporting). RR: writing – original draft (equal) and writing – review and editing (equal). MS methodology and formal analysis (supporting), writing – original draft (equal), and writing – review and editing (supporting). ECal: writing – original draft (supporting) and writing – review, and editing (supporting). CS: writing – original draft (supporting) and review and editing (supporting). CA: conceptualization (lead), writing – original draft (lead), methodology and formal analysis (lead), and writing – review, and editing (equal). All authors contributed to the article and approved the submitted version.

Conflict of interest

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

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References

Bachrach, C. A. and Morgan, S. P. (2013). A cognitive–social model of fertility intentions. *Population and development review*, 39, 459–485.

Betz, N. (2006). Basic issues and concepts in the career development and counseling of women. *in Handbook of career counseling for women*. Routledge. 55–84.

Blangiardo, G. C. (2020). Scenari Sugli Effetti Demografici di Covid-19: Il Fronte Della Natalità. ISTAT per il Paese. Roma. Available at: https://www.istat.it/it/archivio/241844 (Accessed March 31, 2023).

Blangiardo, G. C. (2021). Calo di Nascite a Gennaio 2021: Sintomi di un Disturbo Occasionale o Conferma di un Malessere Strutturale? ISTAT per il Paese. Roma. Disponibile All'indirizzo: https://www.istat.it/it/archivio/241844 (Accessed March 31, 2023).

Bongaarts, J. (2001). Fertility and reproductive preferences in post-transitional societies. *Popul. Dev. Rev.* 27, 260–281 https://www.jstor.org/stable/3115260.

Braun, V., and Clarketi, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3, 77–101.

Burke, R. J., Koyuncu, M., and Wolpin, J. (2012). "Work experiences, satisfactions and psychological well-being among women managers and professionals in Turkey" in Europe's. *J. Psychol.* 8, 95–111. doi: 10.5964/ejop.v8i1.300

Camussi, E., Meneghetti, D., Sbarra, M. L., Rella, R., Grigis, P., and Annovazzi, C. (2022). What future are you talking about? Efficacy of life design Psy-lab, as career guidance intervention, to support university students' needs during COVID-19 emergency. *Front. Psychol.* 13:1023738. doi: 10.3389/fpsyg.2022.1023738

Camussi, E., Rella, R., Grigis, P., Sassi, C., and Annovazzi, C. (2021). Women and Covid19: how the Italian government task force fostered gender equity. *Front Hum Dyn* 3:704727. doi: 10.3389/fhumd.2021.704727

CHESNAIS, J.-C. (2000). Determinants of Below-Replacement Fertility. *Population Bulletin of United*. Nations, 40/41, 126–136.

Corchia, C. (2016). Falling birth rates in Italy: where we come from and where are we going? *Quaderni ACP* 23, 65–74.

Ellemers, N. (2018). Gender stereotypes. *Annu. Rev. Psychol.* 69, 275–298. doi: 10.1146/annurev-psych-122216-011719

European Commission (2021). *Green Paper on Ageing: Fostering Solidarity and Responsibility between Generations*. Luxembourg: Publications Office of the European Union.

European Institute for Gender Equality (EIGE) (2022). Survey of the Largest Publicly-Listed Companies in the EU. Available at: https://eige.europa.eu/gender-statistics/dgs/indicator/wmidm_bus_bus__wmid_comp_compbm/datatable (Accessed March 31, 2023)

Eurostat (2020). Gender Pay Gap in Unadjusted Form. Available at: https://ec.europa.eu/eurostat/databrowser/view/sdg_05_20/default/table?lang=en (Accessed March 31, 2023)

Eurostat (2023). Share of Women Working Part-Time Higher than Men. Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/w/EDN-20230303-1 (Accessed March 31, 2023).

Evans, J., and Gibb, E. (2009). *Moving from Precarious Employment to Decent Work* (Vol. *13*). Geneva: GURN.

Gilrane, V. L., Wessel, J. L., Cheung, H. K., and King, E. B. (2019). The consequences of making the right impressions for STEM women: metastereotypes, impression management, and supervisor ratings. *Arch. Sci. Psychol.* 7, 22–31. doi: 10.1037/arc0000065

Ginevra, M. C., Santilli, S., Camussi, E., Magnano, P., Capozza, D., and Nota, L. (2020). The Italian adaptation of courage measure. *Int. J. Educ. Vocat. Guid.* 20, 457–475. doi: 10.1007/s10775-019-09412-4

Ginevra, M. C., Magnanoi, P., Lodi, E., Annovazzi, C., Camussi, E., Patrizi, P. and Nota, L. (2018). The role of career adaptability and courage on life satisfaction in adolescence. *Journal of adolescence*, 62, 1–8.

Goodman, L. A. (1961). Snowball sampling. The annals of mathematical statistics, 148–170.

Guichard, J. (2018). Final purposes for life-and-career design interventions in the Anthropocene era. New perspectives on career counseling and guidance in Europe: Building careers in changing and diverse societies, 189–204.

Greco, A., Annovazzi, C., Palena, N., Camussi, E., Rossi, G., and Steca, P. (2022). Self-efficacy beliefs of university students: examining factor validity and measurement invariance of the new academic self-efficacy scale. *Front. Psychol.* 12:498824. doi: 10.3389/fpsyg.2021.498824

Gysbers, N. C., Heppner, M. J., and Johnston, J. A. (2009). *Career Counseling: Contexts, Processes, and Techniques*, Washington, DC: American Counseling Association.

Haines, E. L., and Stroessner, S. J. (2019). The role prioritization model: how communal men and agentic women can (sometimes) have it all. *Soc Personal Psychol Compass* 13:e12504. doi: 10.1111/spc3.12504

Holton (2009). Willing, wanting, waiting. OUP Oxford.

International Labour Organization (2017). *World Employment Social Outlook. Trends 2017*. Geneva: ILO.

ISTAT (2015). Natalità e Fecondità della Popolazione Residente. Statistiche Report di ISTAT, Pubblicato il 27 Novembre. Available at: https://www.istat.it/it/files//2020/12/REPORT-NATALITA-2019.pdf (Accessed March 31, 2023).

ISTAT (2019). Bilancio Demografico Nazionale. Statistiche Report ISTAT, Roma. Available at: https://www.istat.it/it/archivio/245466 (Accessed May 15, 2023).

ISTAT (2021a). Lo Shock da Pandemia: Impatto Demografico e Conseguenze Sanitarie. Rapporto Annuale 2021. La Situazione del Paese (pp. 63–112). Roma.

ISTAT (2021b). Natalità e Fecondità della Popolazione Residente - Anno 2020. Statistiche Report ISTAT, Roma. Available at: https://www.istat.it/it/archivio/264643 (Accessed May 15, 2023).

ISTAT (2021c). Popolazione Residente e Dinamica Demografica - Anno 2020. Censimenti Permanenti Popolazione e Abitazioni. Available at: https://www.istat.it/it/archivio/264511 (Accessed May 15, 2023).

ISTAT (2022a). Dinamica Demografica - Anno 2021. Statistiche Report ISTAT, Roma. Available at: https://www.istat.it/it/archivio/267834 (Accessed May 15, 2023).

ISTAT (2022b). Indicatori Demografici - Anno 2021. Statistiche Report ISTAT, Roma. Available at: https://www.istat.it/it/archivio/269158 (Accessed May 15, 2023).

Kulik, L., Shilo-Levin, S., and Liberman, G. (2016). Work–family role conflict and well-being among women and men. *J. Career Assess.* 24, 651–668. doi: 10.1177/1069072715616067

Lappegård, T. (2020). Future fertility trends are shaped at the intersection of gender and social stratification. *Vienna Yearb Popul Res* 18, 43–48. doi: 10.1553/populationyearbook2020.deb04

Leech, N. L., and Onwuegbuzie, C. (2020). Future fertility trends are shaped at the intersection of gender and social stratification. *Vienna Yearb Popul Res* 18, 43–48. doi: 10.1553/populationyearbook2020.deb04

Lundberg, S., and Stearns, A. J. (2009). A typology of mixed methods research designs. *Quality & quantity*, 43, 265–275.

Lutz, W., Skirbekk, V., and Testa, M. (2006). The low-fertility trap hypothesis: forces that may Lead to further postponement and fewer births in Europe. *Vienna Yearb Popul Res*, Austrian: Academy of Sciences Press. 4, 167–192.

Nie, Z., Zurlo, F., Camussi, E., and Annovazzi, C. (2019). Service ecosystem design for improving the service sustainability: a case of career counselling services in the Italian higher education institution. *Sustainability* 11:1427. doi: 10.3390/su11051427

OECD (2021). *Italy Governance Scan for Policy Coherence for Sustainable Development*. Paris: OECD Publishing.

Pascall, G. (2008). "Gender and European Welfare States," in Understanding European Social Policy. eds. P. Abrahamson, and C. Aspalter, CasaVerde Publishing.

Piccitto, G. (2018). Soddisfazione lavorativa ed equilibrio casa-lavoro: un'analisi di genere. *Stato Mercato* 38, 461–498. doi: 10.1425/91628

Rubery, J., and Piasna, A. (2017). Labour market Segmentation and Deregulation of Employment Protection in the EU. Myths of Employment Deregulation: *How It Neither Creates Jobs nor Reduces Labour Market Segmentation, Brussels: ETUI*, 43–60.

Ryan, M., and Haslam, S. (2005). The glass cliff: evidence that women are over-represented in precarious leadership positions. *Br. J. Manag.* 16, 81–90. doi: 10.1111/j.1467-8551.2005.00433.x

Savickas, M. L. (2012). Life design: a paradigm for career intervention in the 21st century. *J. Couns. Dev.* 90, 13–19. doi: 10.1111/j.1556-6676.2012.00002.x

Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J. P., Duarte, M. E., Guichard, J., et al. (2009). Life designing: a paradigm for career construction in the 21st century. *J. Vocat. Behav.* 75, 239–250. doi: 10.1016/j.jvb.2009.04.004

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., and Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *J. Cross-Cult. Psychol.* 32, 519–542. doi: 10.1177/0022022101032005001

Stone-Romero, E. F. and Anderson, L. E. (1994). Relative power of moderated multiple regression and the comparison of subgroup correlation coefficients for detecting moderating effects. *Journal of applied psychology* 79, 354.

Suero, C. (2023). Gendered division of housework and childcare and women's intention to have a second child in Spain. *J Popul Sci* 79, 1–29. doi: 10.1186/s41118-023-00182-0

Suk, J. C. (2010). Columbia are gender stereotypes bad for women? *Columbia Law Rev.* 110, 1–69.

Swanson, J. L., and D'Achiardi, C. (2005). "Beyond interests, needs/values, and abilities: assessing other important career constructs over the life span" in *Career Development and Counseling: Putting Theory and Research to Work*. eds. S. D. E. Brown and R. W. Lent (New York: Wiley), 353–381.

Swanson, D. L., and Mancini, P. (1996). Politics, media, and modern democracy: An international study of innovations in electoral campaigning and their consequences. Greenwood Publishing Group.

The World Bank, IBRID – IDA (2023). World Bank National Accounts Data, and OECD National Accounts Data Files. Available at: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=IT (Accessed March 31, 2023).

Ussher, J. M., and Mooney-Somers, J. (2000). Negotiating desire and sexual subjectivity: Narratives of young lesbian avengers. *Sexualities* 3, 183–200.

Van der Lippe, T., and Lippènyi, Z. (2020). Beyond Formal Access: Organizational Context, Working From Home, and Work–Family Conflict of Men and Women in European Workplaces. *Soc Indic Res*, 151, 383–402. doi: 10.1007/s11205-018-1993-1

Venetian Association Sustainable Development, Forum di Limena (2019). Demografia e Welfare Sostenibili. Il Veneto e le Sue Comunità Locali. Available at https://www.aulss1.veneto.it/piano_di_zona/demografia-e-welfare-sostenibili-nel-veneto-e-nelle-sue-comunita-locali/ (Accessed February 17, 2023).

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Students managing work and study role boundaries: a person-centred approach

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To cope with demands of working while studying, students must structure the boundaries between these roles (e.g., integrate or segment them) to suit their preferences and circumstances. However, students differ on how well they do this, and we do not yet understand the factors that contribute to managing work and study well. We sought to determine if different student groups existed and if the groups reported different work, study, and wellbeing outcomes. Using latent profile analysis and assessing work-study boundary congruence and flexibility (N = 808; 76% female; M_{Age} 19.6 years), we identified four groups of (a) "balanced" (65.4%; with moderate boundary congruence and flexibility); (b) "high work congruence and flexibility" (17.5%; working arrangements supportive of study role); (c) "low work congruence and flexibility" (9.7%; unsupportive workplace arrangements); and (d) "low study congruence" (7.3%; study arrangements unsupportive of work role). These groups reported different work/study demands, role conflict, study burnout, and perceived employability, with "balanced" and "high work congruence and flexibility" groups scoring more positively and "low work congruence and flexibility" and "low study congruence" groups scoring more negatively. Results supported that different student groups existed, and these will need different supports to manage their multiple role responsibilities.

KEYWORDS

role boundary management, work flexibility, work-study demands, work-study conflict, study burnout, future employability

1. Introduction

Around 80% of students enrolled in Australian universities juggle work with study (Australian Bureau of Statistics, 2021), which is consistent with statistics reported in other developed countries, such as the United States (85%; HSBC, 2018). By-and-large, working students are employed in precarious jobs (Campbell and Price, 2016), characterised by poor conditions, irregular hours, low pay, insecurity, and little regulatory protection (Vosko, 2011; Creed et al., 2020a,b). They work to generate discretionary spending and cover living expenses and tuition fees (HSBC, 2018). Those who can manage these two important, but often challenging and competing roles (e.g., for time and energy), report better study engagement, performance, and wellbeing (Chu et al., 2021a,b). Our aim was to determine whether different clusters (groups, types) could be identified in the seemingly heterogeneous population of

working students based on differences in congruence and flexibility in these two roles.

Understanding how students manage the boundaries, or interface, between work and study roles can help explain how they meet their work and study obligations and account for study, career, and wellbeing outcomes (Kreiner et al., 2009). Variable-centred research has shown that work-study boundary congruence (i.e., attained fit or correspondence between work and study roles) is associated with better psychological wellbeing and more study engagement in working students (Chu et al., 2021b). However, understanding how different types of students manage their role boundaries, and how these different patterns might relate to important student outcomes, can inform those who assist students, such as counsellors and education providers. As a result, we took a person-centred approach.

The study was informed by general interactionist and person-environment fit theories (Muchinsky and Monahan, 1987; Van Vianen, 2018), which state that behavioural variability occurs because of the interaction between the person and the environment, that the person will seek out environments that best suit them, that better suited environments are related to better outcomes, and that individuals will attempt to manage their environment and their responses to it to improve fit. We expected to identify different patterns of behaviour in working students depending on their work-study preferences, the preferences of others, situational affordances, and their capacity to manage the work-study interface to their advantage. While testing for different groupings based on membership patterns is an exploratory methodology (Spurk et al., 2020), previous research in the vocational psychology area has identified clusters based on career development variables in both working adults (for review, see Spurk et al., 2020) and university students (Araújo et al., 2019).

We operationalised person/environmental and boundary management constructs using two sets of variables: (a) perceived work and study boundary congruence and (b) the capacity to manage the person-fit interaction (i.e., work and study flexibility-ability and flexibility-willingness, reflecting the individual's capacity to influence fit and the motivation to do so; Matthews and Barnes-Farrell, 2010). Additionally, we aimed to validate any patterns identified by examining differences among them on five variables important to working students: work and study demands, role conflict, study burnout, and students' view of their future employability.

Boundary congruence theory proposes that an individual's multiple roles, such as work and study roles, are separated by cognitive, physical, and behavioural boundaries, and that people strive to more-or-less segment or integrate these roles depending on their boundary preferences and the constraints imposed by the environment (e.g., job demands, study needs). Further, individuals strive to increase role congruence (i.e., to maximise integration or segmentation), and perform better and feel more satisfied when they do so (Ashforth et al., 2000; Chen et al., 2009; Kreiner et al., 2009). For example, those able to generate more work-study congruence (e.g., by co-ordinating work and study schedules) should be able to meet their work and study responsibilities better and be more satisfied with their work and study arrangements. Chu et al. (2020) tested these relationships and showed that that higher work-study boundary congruence was related to better wellbeing and more study engagement in working students. In contrast, boundary incongruence (e.g., less integration than desired) generates conflict between roles and reduces capacity to meet responsibilities in both (Brough and O'Driscoll, 2015). For working students, this can make it more difficult to study as well as work (Wan et al., 2022). Thus, boundary congruence can be considered to be the level to which individuals have shaped their role boundary interface to suit their own preferences and the wishes of others, such as job supervisors and study colleagues (Chu et al., 2018).

The capacity to generate boundary congruence is influenced by the person's social and physical environments, over which the individual does not have full control. This is reflected in boundary flexibility-ability, or the "individual's perception of personal and situational constraints that affect boundary management" (p. 330), and boundary flexibility-willingness, the "motivationally oriented individual difference variable that contributes to actual levels of domain segmentation-integration" achieved (Matthews and Barnes-Farrell, 2010; p. 332). For example, working students will identify opportunities to adjust the overlap between study and work roles (i.e., increase or decrease work-study integration or segmentation – reflecting boundary flexibility-ability) and will differ on their motivation to implement such adjustments (i.e., reflecting boundary flexibility-willingness). Previous studies have shown that a capacity to ease movement between role domains is a resource for the person (Ashforth et al., 2000; Matthews and Barnes-Farrell, 2010; Winkel and Clayton, 2010), while in the career area, Creed et al. (2022) showed that both flexibility-ability and flexibility willingness were related to less burnout and greater engagement in working students.

From the above, we expected that different groups of working students would show different patterns, or styles, of functioning based on perceived boundary congruence and the role interface management strategies regarding boundary flexibility and willingness, reflecting both individual and environmental factors, consistent with interactionist and fit theories (Muchinsky and Monahan, 1987; Van Vianen, 2018) and boundary theory (Chen et al., 2009). To test this proposal, we used latent profile analysis (LPA), which is a person-centred method suitable for identifying distinct groupings of individuals based on different configurations of person- and/or environmental-level characteristics. Person-centred approaches like LPA are important research methods as they supplement variable-level methodologies, which test relationships among individual variables (Spurk et al., 2020).

We found no studies that had tested for sub-populations of working students based on boundary management constructs, such as boundary congruence and management strategies. In the career area, person-centred approaches have been applied to assess groupings based on work motivation, job crafting, organisational commitment, and career adaptability (for review, see Spurk et al., 2020); while one study in the work-family area tested for boundary management styles and their relationship to work and family functioning, finding that low control styles were associated with poorer work and family outcomes (Kossek et al., 2012).

Because of the exploratory nature of LPA, we developed a non-specific hypothesis, but one based on an examination of the literature regarding boundary management and with reference to relevant theories. LPA enables exploration of both quantitative (i.e., differences on profile scores) and qualitive profile differences (i.e., differences on overall profile shapes; e.g., profiles might be parallel or non-parallel; Marsh et al., 2009). Quantitative differences might suggest that different groups would benefit from different types of skills development, whereas qualitative differences might indicate that

all groups could benefit from the same training, but at different levels. Both score and shape differences support validity that the profiles identified reflect true population differences (Spurk et al., 2020). The latent profile analysis hypothesis was:

> *Hypothesis 1*: Different profiles exist for working students that reflect person and environmental characteristics implicit in perceptions of boundary congruence and flexibility (ability and willingness).

In addition, we aimed to test how any resultant profiles might differ on important outcome variables for working students. These outcomes were work and study demands, role conflict, study burnout, and perceived future employability. Testing these relationships would provide support for convergent validity for the different profiles identified, while allowing insight into how and when interventions might be required for students with different styles of boundary management between work and study.

Work and study demands refer to the person and situational challenges encountered on-the-job and at university that are associated with some level of personal cost, such as sapping energy and depleting personal resources (Demerouti et al., 2001). Workplace demands are related to poorer academic performance, satisfaction (Taylor et al., 2020; Wan et al., 2022) and wellbeing (Carney et al., 2005; Mounsey et al., 2013). Similarly, excessive study demands are related to more negative outcomes in students, including poorer mental health (Salmela-Aro and Upadyaya, 2014) and less academic engagement (Cilliers et al., 2018).

Role (work-study) conflict occurs when participation in one role negatively affects performance and functioning in another (Greenhaus and Beutell, 1985; Greenhaus and Powell, 2006). For example, students' over-commitment at work (e.g., working long hours) conflicts with study by reducing the time and effort available. Work-study role conflict is associated with more negative feelings about study (Creed et al., 2015), greater mental distress (Waterhouse et al., 2020), less study effort, and poorer grades (Meeuwisse et al., 2017).

Study burnout refers to the physical and mental exhaustion and cynical attitude that develops towards study, which results from ongoing exposure to demanding and emotionally draining student situations (Marôco and Campos, 2012). University students are especially susceptible to burnout as they must simultaneously managing academic performance, work and survival demands, and numerous developmental challenges (e.g., around identity and relationship development). In working students, burnout is related to poorer outcomes, such as less study engagement (Barratt and Duran, 2021) and reduced academic (Galbraith and Merrill, 2015) and job performance (Vîrgă et al., 2019).

Finally, student *perceived future employability* is their view of how employable they will be after completing formal education (Gunawan et al., 2019). Higher perceptions of future employability are related to positive outcomes, including holding higher career aspirations, engaging in more career planning, exerting more effort to career progression, having stronger study commitment and academic performance, and experiencing less career indecision and distress (Gunawan et al., 2019, 2021; Creed et al., 2020a,b).

Importantly, all outcomes have been shown to be related to boundary management practices (for review, see Eastgate et al., 2021). For example, work-study boundary permeability (i.e., how easy it is for role responsibilities to cross role boundaries) is associated with more work and study role overload and greater work and study demands (Wan et al., 2022); work-study boundary segmentation (i.e., strength of boundary separation between roles) is related to less work-study conflict and more enrichment (van Steenbergen et al., 2018); and work-study boundary congruence is related to better wellbeing and higher levels of perceived future employability (Chu et al., 2021a,b). From a theoretical perspective (e.g., job-demands model; Owen et al., 2018), challenging boundary management experiences and negative boundary management outcomes drain personal resources and reduce energy and enthusiasm that could be applied to work and study activities.

We generated broad expectations related to profile-outcome relationships, although these were informed by previous studies and theory. We anticipated that profiles that were higher on boundary congruence and/or role interface management strategies (i.e., boundary flexibility capacity and willingness) would return more positive scores on the outcomes (e.g., perceiving fewer work-study demands, less work-study conflict, less burnout, and higher perceived employability), vis-à-vis those lower on congruence and management strategies.

> *Hypothesis 2*: Profiles higher on work-study boundary congruence and role interface management strategies show lower workplace demands, study demands, and study burnout, and higher perceived future employability.

To date, it has not been demonstrated that there are distinct patterns of boundary management styles in working students and, if there are, whether they relate to variables that are important for students' present and future functioning and achievement. We contribute to the literature in this area by applying LPA to explore working student boundary profiles based on boundary congruence, flexibility-ability, and flexibility-willingness. Boundary management success is reflected in students' own preferences (i.e., for integration/segmentation), the preferences of others, situational affordances, and students' capacity and willingness to influence the work-study boundary interface for their own benefit. Second, we tested for relationships between identified profiles and variables of work-study demands, role conflict, study burnout, and perceived future employability. Identifying different groupings of working students, and the way they relate to career outcomes, can inform interventions to assist those struggling to manage work and study responsibilities.

2. Materials and methods

2.1. Participants

Participants were 808 undergraduate students recruited from two Australian universities (75.9% female; mean age 19.63 years, *SD* = 2.24, range 17–25 years). Almost all were domestic students, with a small proportion being international students studying in Australia. They were enrolled in foundation year courses in their respective universities that catered for students from a wide range of study program (e.g., business, counselling, nutrition, education, psychology, communications, medicine, and architecture); thus, the sample was quite heterogeneous for study interests and ability. All were working,

as this was the inclusion criterion (mean hours worked per week = 18.76, *SD* = 9.56), mostly in casual or ongoing, part-time jobs in the service and leisure industries. For financial situation, 31% indicated *living comfortably on present income*, 46% were *managing*, 19% were *finding it difficult*, and 5% were *finding it very difficult* (mean 1.98, *SD* = 0.82; European Social Survey, 2010).

2.2. Measures

Participants answered questions using 6-point Likert-like responses (1 *strongly disagree* to 6 *strongly agree*), unless otherwise noted. Item scores were summed to generate totals, with higher total scores reflecting higher levels of the construct being measured. Internal reliability coefficients were calculated using Cronbach's alpha formula and construct validity was supported by testing all scales together in a confirmatory factor analysis (CFA).

Work congruence. The 4-item Occupational Congruence Subscale from the Work-Study Congruence Scale (Chu et al., 2018) assesses the degree to which supervisors and colleagues in the workplace support work flexibility to meet student study demands (e.g., "My work supervisor will consider my study commitments when setting work rosters"). Chu et al. (2018) reported an Cronbach alpha of 0.92 and supported validity by finding expected correlations with other role conflict constructs. With the current sample, alpha (α) was 0.85.

Study congruence. The 4-item University Demands and Resources Subscale from the Work-Study Congruence Scale (Chu et al., 2018) assesses participants' level of flexibility provided by their study program (e.g., "The availability of study or lecture material online makes it easier for me to work ad study"). Chu et al. (2018) reported α = 0.83 and support for validity from a negative relationship with work-study incongruence. Our α was = 0.74.

Work and study flexibility and ability. We adapted four scales devised by Matthews and Barnes-Farrell (2010) to assess these constructs in university students. The 4-item *Work Flexibility-Ability Scale* (e.g., "I am able to arrive and depart from work when I want in order to meet my *study* [original: *family and my personal life*] responsibilities"). Original α was 0.84; current = 0.81. The 4-item *Work Flexibility-Willingness Scale* ("I am willing to take an extended lunch break so that I can deal with *study* responsibilities [original: *relating to my family and personal life*]). Original α was 0.68; current = 0.71. The 5-item *Family Flexibility Scale* ("If the need arose, I could work late without affecting my *university or study* [original: *family and personal*] responsibilities"). Original α was 0.72, current = 0.80. The 6-item *Family Flexibility-Willingness Scale* ("I am willing to change *university or study* plans [original: *my friends' and family*] so that I can *go to work* [original: *finish a job assignment*]"). Original α was 0.75, current = 0.81. Matthews and Barnes-Farrell provided support for validity by finding expected associations with work-to-nonwork conflict, and work and nonwork centrality.

Job demands. The 9-item Psychological Job Demands Scale from the Job Content Questionnaire (Karasek et al., 1998) assesses psychological strain from paid work (e.g., "I am required to work fast" and "I have to work hard"). Participants answered items using a 5-point frequency format (1 *rarely* to 5 *very often*). Niedhammer (2002) found α = 0.77 and supported validity by finding negative relationships with social support. Our α was 0.85.

Study demands. The 6-item Role Overload Scale (Thiagarajan et al., 2006), originally developed to examine parent role demands, was adapted to study demands (e.g., "I have to do things *for university* that I do not really have time and energy for"). The authors reported α = 0.87 and supported validity by finding expected correlations with hours worked. Our α = 0.88.

Work-study conflict. The 5-item Work-School Conflict Scale (Butler, 2007) was adapted for use with university students (e.g., "Because of my job, I go to *university* tired"). Creed et al. (2015) reported alpha of 0.82 with university students and supported validity by finding positive associations with time, strain, and behaviour-based demands. Our α was 0.87.

Study burnout. We adapted Kristensen et al.'s (2005) 7-item Work-Related Subscale from the Copenhagen Burnout Inventory to assess how students felt as a result of their study demands (e.g., "Do you feel worn out at the end of your *study day* [original: *working day*]?"; 5-point response from 1 *rarely* to 5 *very often*). This measure has been adapted previously for use with college students and found to have good reliability and support for validity (*cf.* Marôco and Campos, 2012). Kristensen et al. reported an alpha of 0.87 for the original scale and supported validity by finding negative associations with several health measures. Our α = 0.89.

Future employability. A 6-item version of the Perceived Future Employability Scale (Gunawan et al., 2019) was used to assessed confidence of gaining employment when students' education was completed. We used the 6 highest loading items from the exploratory factor analysis reported by the authors for their 24-item full scale (e.g., "When I complete my studies, I will have gained the knowledge required to get the job I want"). Gunawan et al. (2019) reported an α of 0.95 and supported validity by finding positive correlations with career ambition and university commitment. Our α for the abbreviated scale was 0.87.

2.3. Procedure

The study was approved by ethics' committees of both participating universities. Students were contacted *via* their course websites and provided with a link to an online survey. Participation was voluntary and anonymous, and for their time and effort, students could opt to enter a prize draw for a $50 store voucher. They were advised on the information sheet that submitting the completed questionnaire would indicate their informed consent.

Before conducting the LPA, we performed a CFA to test the construct validity of the scales. We assessed a 6-factor model using all the scales used for the LPA (i.e., work and study congruence, work flexibility-ability and -willingness, and study flexibility-ability and -willingness). For the CFA, we constructed item parcels as these generate fewer and more stable estimates, more parsimonious models to be interpreted, and reduce the possibility of violating assumptions of normality (Little et al., 2013). Parcels were generated by conducting separate exploratory factor analyses for each scale, ordering the items by factor loading, and then assigning a mixture of high- and low-loading items to each parcel (Hau and Marsh, 2004). This model generated a good fit (*cf.* Hair et al., 2010), $\chi^2(39) = 109.51$, $p < 0.001$, $\chi^2/df = 2.81$, CFI = 0.98, and RMSEA = 0.05, which supported proceeding with the LPA.

LPA identifies latent population sub-groups based on scores on predetermined measures of interest, which can be person- or environmental-based. Using latent factor scores, several profiles are generated and these are then assessed to identify the best fitting version (Nylund et al., 2007; Spurk et al., 2020). We used the *tidy*LPA package in R (V4.0.3) with maximum likelihood with robust standard errors (MLR), as this provides more accurate estimates and improves the reliability of results (Nylund et al., 2007). For fit statistics, we consulted Akaike's Information Criterion (AIC), the Bayesian Information Criterion (BIC), and the sample-size adjusted BIC (SABIC); lower scores for all indicate a better fit (Spurk et al., 2020; Zhang et al., 2021). We conducted Bootstrap Likelihood Ratio Tests (BLRT; w), which assess whether an LPA profile (model k) is a good fit compared to whether an alternative model (model $k+1$) is required; fit is indicated when $k+1$ is not significant (Spurk et al., 2020). We also assessed entropy (or how distinct profiles are from one another), where higher entropy levels indicate a better fit (ideally >0.60; Jung and Wickrama, 2008).

Last, after identifying the best fitting profiles, we tested, using SPSS (V27), whether these profiles differed on a set of outcome variables that included job demands, study demands, work-study conflict, study burnout, and perceived future employability.

Assumptions for all statistical procedures were assessed and met requirements.

3. Results

3.1. Relationships among LPA variables

From the correlation matrix, all variables (work and study congruence, flexibility-ability, and flexibility-willingness) were associated weakly to moderately with one another ($|r|$ range = 0.13 to 0.39), except for study flexibility-willingness, which was correlated with work flexibility-willingness and study flexibility-ability only, and study flexibility-ability, which was not correlated with work-flexibility-willingness. Correlations with demographic questions ranged from $|r|$ 0.01 to 0.25 (see Table 1).

3.2. Latent profile analysis

First, based on Mahalanobis Distance, we deleted four multivariate cases to reduce the possibility that outliers would distort the profiles generated (Spurk et al., 2020). After this, we specified a series of LPA models, varying from one to five profiles. These models, along with their fit statistics, are reported in Table 2. There was a decline in AIC, BIC, and SABIC statistics until the 4-profile model, after which there was an increase. Entropy was highest for the 4-profile solution, and BLRT for this solution was significantly different from the 5-profile model. Based on this, we accepted the 4-profile model.

The 4-profile model is reported in Figure 1, with standardized scores indicating *SD* units. We followed recommendations by Gustafsson et al. (2018) and treated values greater than ±0.50 *SD* as indicating a meaningful difference from the mean. Profile 1 contained 17.5% of students who were characterised by higher levels of work congruence (+0.50 *SD*), work flexibility-ability (+1.29 *SD*), and work flexibility-willingness (+0.54 *SD*), and average levels of study congruence (+0.22 *SD*), study flexibility-ability (−0.02 *SD*) and study flexibility-willingness (+0.05 *SD*). This profile was labelled the *high work congruence/flexibility* group.

Profile 2 (9.7%) was characterised by lower levels of work congruence (−1.96 *SD*), work flexibility-ability (−0.61 *SD*), and work flexibility-willingness (−0.54 *SD*), and average levels of study congruence (+0.02 *SD*), study flexibility-ability (−0.29 *SD*) and study flexibility-willingness (+0.28 *SD*). This was labelled the *low work congruence/ flexibility* group. Profile 3 (the largest group; 65.4%) reflected those with average levels of work (+0.20 *SD*) and study congruence (+0.18 *SD*), work (−0.31 *SD*) and study (+0.10 *SD*) flexibility-ability, and work (−0.07 *SD*) and study (−0.08 *SD*) flexibility-willingness and was labelled the *balanced* group. Last, Profile 4 (7.3%) was characterised by lower levels of study congruence (−1.86 *SD*) and average levels of work congruence (−0.34 *SD*), study (−0.38 *SD*) and work (+0.02 *SD*) flexibility-ability, and study (+0.14 *SD*) and work (−0.08 *SD*) flexibility-willingness. This profile was labelled the *low study congruence* group.

Considering shape similarities/differences, Profiles 2 (*low work congruence/ flexibility*) and 4 (*low study congruence*) had similar profiles, except that Profile 2 was characterised by being low on work congruence (−1.96) and Profile 4 by being low on study congruence (−1.86). Profiles 1 (*high work congruence/work flexibility*) and 3 (*balanced*) were similar, with all average scores except Profile 1 reported higher levels of work flexibility-ability and flexibility-willingness. The four profiles were not differentiated by study flexibility-ability and study flexibility-willingness, with variability driven by the relationship with work (congruence), opportunities for flexibility at work (work flexibility-ability), and personal resources for actioning these opportunities (work flexibility-willingness).

3.3. Differences in outcome variables across profiles

We tested differences on the four profiles for the outcomes of job demands, study demands, work-study conflict, study burnout, perceived future employability, and the biographic variables (age, gender, hours worked, financial situation). As the assumption of homogeneity of variances were not met for work-study conflict, burnout, employability, age, hours worked, and financial situation, we used Welch's ANOVA, which adjusts the degrees of freedom accordingly, when testing these variables. For testing gender differences, we used χ^2 cross-tabulation. From these analyses, we found significant differences among the four profiles on all five outcomes and the demographic variables (see Table 3).

Profile 2 (*low work congruence/flexibility*) reported higher job demands than the other profiles, $F(3, 800) = 7.26$, $p < 0.001$. Profiles 2 (*low work congruence/flexibility*) and 4 (*low study congruence*) had higher study demands, $F(3, 800) = 10.83$, $p < 0.001$; work-study conflict, $F(3, 165.98) = 28.72$, $p < 0.001$, and burnout, $F(3, 163.30) = 6.09$, $p < 0.001$, than Profiles 1 (*high work congruence/ flexibility*) and 3 (*balanced*). Last, Profiles 1 and 3 reported higher employability than Profile 4 (*low study congruence*), $F(3, 157.42) = 3.37$, $p = 0.02$.

For the biographic variables, there was little variability among profiles for age (likely due to sample age range restriction of 17–25 years), although Profile 2 (*low work congruence/ flexibility*) was

TABLE 1 Summary data and bivariate correlations for LPA and demographic variables; *N* =808.

Variable	*M*	*SD*	1	2	3	4	5	6
1. Work congruence	18.46	4.32	–					
2. Study congruence	19.51	3.25	0.20***	–				
3. Work flexibility-ability	11.18	4.70	0.37***	0.13***	–			
4. Work flexibility-willingness	15.29	3.87	0.15***	0.13***	0.39***	–		
5. Study flexibility-ability	17.11	4.98	0.18***	0.22***	0.19***	−0.03	–	
6. Study flexibility-willingness	13.67	4.35	−0.03	−0.02	−0.02	−0.18***	0.40***	–
7. Age (years)	19.63	2.24	−0.10**	−0.01	−0.05	−0.06	−0.07*	0.08*
8. Gender[a]	–	–	0.03	−0.05	0.14***	0.07*	0.01	−0.05
9. Hours worked per week	18.72	9.55	−0.22***	0.05	−0.05	−0.07*	−0.01	0.25***
10. Financial situation	1.98	0.82	−0.11**	−0.12**	−0.14***	−0.04	−0.11**	0.04

[a]0 = female, 1 = male; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

TABLE 2 Results of latent profile analysis for 1- to 5-profile models (*N* =804).

Profiles	LL	AIC	BIC	SABIC	BLRT *p*	Entropy
1	−6567.33	13188.66	13315.28	13229.54	–	1.00
2	−6543.48	13154.97	13314.41	13206.44	0.01	0.67
3	−6482.47	13046.93	13239.21	13109.01	0.01	0.71
4	−6456.28	**13008.57**	**13233.67**	**13081.24**	**0.01**	**0.73**
5	−6474.87	13059.74	13317.67	13143.02	0.75	0.48

LL = model log likelihood; AIC = Akaike's Information Criterion; BIC = Bayesian Information Criterion; SABIC = sample-size adjusted BIC; BLRT *p* = significance level for Bootstrap Likelihood Ratio Test. Boldface indicates best fit.

older than Profile 3 (*balanced*), $F(3, 157.90) = 4.18$, $p = 0.007$. Profile 2 also worked more hours per week than all other Profiles, $F(3, 155.90) = 11.83$, $p < 0.001$, and reported more financial difficulties than Profiles 1 and 3, $F(3, 157.95) = 4.54$, $p = 0.004$. There were more female than male students in Profile 2 (*low work congruence/flexibility*; $n = 67$ vs. 59) and fewer female students in Profiles 1 (*high work congruence/flexibility; n* = 93 vs. 107) and 4 (*low study congruence; n* = 38 vs. 45), χ^2 $(3, N = 803) = 18.08$, $p < 0.001$.

4. Discussion

This study was informed by the interactionist/fit (Muchinsky and Monahan, 1987; Van Vianen, 2018) and boundary theories (Kreiner et al., 2009) and contributed novel information on how different groups of students perceived their boundary management between the work and study domains. We sought to identify if there were different profiles based on boundary congruence and flexibility, constructs that represented students' capacity and willingness to manage the work-study role interface in the context of situational constraints (*H1*) and whether the different profiles differed on work and study demands, role conflict, burnout, and future employability (*H2*). Supporting *H1*, four differentiated profiles were identified: *high work congruence and flexibility* (Profile 1; 17.5%), *low work congruence and flexibility* (Profile 2; 9.7%), *balanced* (Profile 3; 65.4%), and *low study congruence* (Profile 4; 7.5%). Supporting *H2*, these profiles differed on levels of the five study, work, and career measures.

The four profiles were differentiated by role congruence and work flexibility, but not by study flexibility-ability (i.e., student's *capacity* to be flexible about study commitments) or study flexibility-willingness (i.e., *willingness* to be flexible about study commitments). Despite an increase in flexible learning in recent years, especially since the global pandemic, university students are still restricted when it comes to much of their university life and must make semester-wide study commitments. For example, they have restricted laboratory class times, assignments are expected to be submitted at set times, and exams typically are scheduled for one sitting only, even if this is online to increase flexibility of access (Stone et al., 2019). Additionally, for most working students, study is seen as the main role and work as secondary, and the primary commitment is likely to be to study even though many must work to survive (Butler, 2007). Thus, all students might have had similar perceptions that they have study commitments that they have little opportunity to modify and might not want to modify as they give priority to their study. Both of which might account for the low variability across the four profiles on study flexibility-ability and flexibility-willingness.

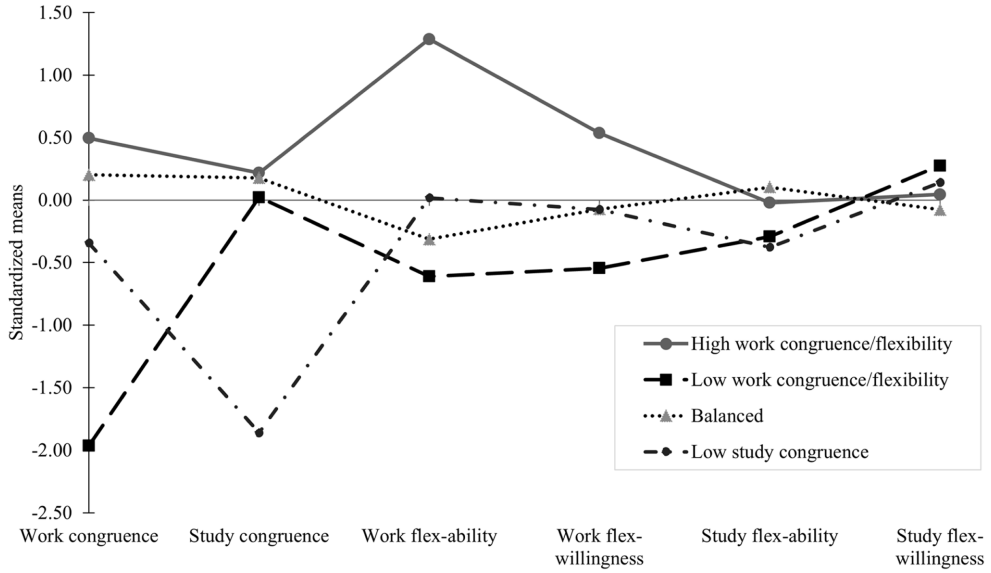

FIGURE 1
The 4-profile model.

TABLE 3 Differences on outcome and demographic variables by profile.

Outcomes	Profile 1: high work congruence/ flexibility (*N* =141)	Profile 2: low work congruence/ flexibility (*N* =78)	Profile 3: balanced (*N* =526)	Profile 4: low study congruence (*N* =59)	Differences among profiles
	M (SD)	M (SD)	M (SD)	M (SD)	
Job demands	29.33 (7.35)	33.85 (7.00)	30.56 (6.83)	30.93 (7.03)	2 > 1, 3, 4***
Study demands	18.62 (6.08)	22.29 (6.43)	18.77 (5.86)	21.34 (5.96)	2, 4 > 1, 3***
Work-study conflict	14.21 (5.29)	19.27 (4.03)	15.41 (4.58)	17.92 (4.44)	2, 4 > 1, 3***
Study burnout	23.21 (7.40)	25.55 (7.43)	23.07 (6.37)	25.81 (5.64)	2, 4 > 1, 3***
Future employability	27.67 (4.95)	26.13 (6.85)	27.36 (5.18)	25.08 (6.34)	1, 3 > 4*
Age	19.74 (2.26)	20.38 (2.47)	19.45 (2.12)	20.03 (2.60)	2 > 3**
Hours worked	18.78 (10.53)	25.28 (10.56)	17.79 (8.62)	18.71 (10.51)	2 > 1, 3, 4***
Financial difficulties	1.84 (0.73)	2.28 (0.95)	1.96 (0.79)	2.12 (0.93)	2 > 1, 3**

Scheffé test used for post-hoc comparisons for job demands and study demands; Welch's ANOVA and Games-Howell test used for *post-hoc* comparisons for remaining variables. For gender (0 = female, 1 = male), there were disproportionately more females in Profile 2 and fewer in Profiles 1 and 4. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Turning to the individual profiles, Profile 3 (i.e., *balanced*) can be considered the reference group as it contained the largest number of students (65.4%). This group reported near-average means (< ±0.05 *SD*) on all boundary congruence and boundary management variables. Profile 1, which was above average (> 0.50 SD above the mean) on work congruence, flex-ability, and flex-willingness (17.5%), was the only group that held above average views of their workplace, perceiving both supportive and flexible working arrangements that were facilitative of study commitments. Profile 2 (i.e., *low work congruence/flexibility*; 9.7%), reported the poorest workplace conditions vis-à-vis study, with the lowest levels of support for study and workplace flexibility, either ability or willingness. Last, Profile 4 (i.e., *low study congruence*; 7.3%), which was the smallest group, reported the most difficulty in the study domain, perceiving that the university did not offer supportive arrangements to facilitate their work and study responsibilities.

Profile 3 (*balanced*; 65.4%) can be considered those students whose work and study role boundaries were structured in such a way as to allow them to adequately manage their work and study responsibilities. This boundary structuring is likely to result from both employer commitments (e.g., to support flexibility to enable student workers to meet study demands) and student effort (e.g., negotiating work flexibility, being willing to accept that flexibility, and rejecting employment that cannot be flexible). Supporting the notion that these students had role boundaries structured to enable management of both work and study, this group reported lower levels of study demands, work-study conflict, and burnout, and higher levels of perceived future employability than Profiles 2 and 4 that had lower work and study congruence, respectively, and lower levels of job demands than Profile 2.

Profile 1 students (*high work congruence and flexibility*; 9.7%) were distinguished by holding positive views of their workplace. They

perceived that the workplace arrangements supported their need to manage study (i.e., congruence) and provided high levels of flexibility, which they felt willing to utilise. As a group, similar to the *balanced* group, they reported lower levels of job and study demands, less work-study conflict and study burnout, and more optimism regarding their future employability than Profiles 2 and 4. These results point to benefits for those who are able to structure their work roles in such a way as to generate support from supervisors and co-workers and build in flexible working arrangements. We do not know whether these arrangements were fortuitous or whether the students managed their boundary arrangements to suit. Future research needs to assess this, as determining ways to increase workplace support and flexibility is likely to bring benefits. Consistent with this, previous research has shown that role management by working students was related to better university adaptation (Swanson et al., 2006), higher wellbeing (Chu et al., 2021b), and a more optimistic view of the future (Chu et al., 2021a).

While we demonstrated that average to above average work congruence and flexibility (i.e., Profiles 3 and 1) had the most positive scores on the outcome variables, it will be important now to explore the personal qualities and skills these groups bring to managing work and study boundaries, and whether these qualities and skills can be enhanced and/or developed in students in the other groups that did not have such positive profiles and outcomes. Negotiating skills, for example, might be higher in those students in Profiles 1 and 3, and, if this is the case, training in negotiation, which can be developed or trained successfully in university students (McGuire et al., 2020), could be added to interventions for students who struggle to manage their work and study boundaries.

Students from Profile 2 (*low work congruence/flexibility*; 9.7%) reported the poorest workplace conditions vis-à-vis study. They had the lowest levels of workplace support for study and flexibility. Thus, this group perceived little support for or opportunity to generate workplace flexibility to suit their study, and little preparedness to negotiate more flexible arrangements. Consistent with this, this group reported the highest level of job demands and, along with the low study congruence Profile 4 group, higher levels of study demands, work-study conflict, and burnout than the better placed Profiles 1 and 3. Thus, the lack of workplace congruence and flexibility was reflected in perceptions of higher demands in both the work and study domains, conflict between the domains, and poorer wellbeing.

These students (Profile 2) might be unfortunate to find themselves having to accept work with employers who offer little flexibility, or these poor outcomes might be the result of student characteristics that limit their boundary management negotiations, or a combination of both environmental challenges and person qualities. Potentially, they then are more likely to have to prioritize work responsibilities over study commitments, to the detriment of their studies. However, we cannot determine from the data we collected whether situational or person qualities are more important or whether this leads students to give primacy to the work domain (e.g., to maintain their work and, thus, income) and future studies need to tease this out. Additionally, despite perceiving greater domain demands and conflict and reporting higher levels of burnout, these students did not perceive poorer employability in their future. Perhaps they think that if they can survive in work with little support and flexibility, they will be able to do well in their future post-graduation employment.

Profile 4 (*low study congruence*; 7.5%), the smallest group, was characterised by reporting the most difficulty with the study domain (i.e., that the university did not offer supportive arrangements to facilitate both work and study responsibilities). This group exhibited similarly negative scores on the outcome variables as the group that reported the poorest workplace conditions (i.e., Profile 2). Profile 4 students perceived higher study demands, role conflict, and study burnout, and less optimism for their future employability than Profiles 1 and 3 that were average or above on the workplace support factors. The evidence here for Profile 4 (poor study domain perceptions) and Profile 2 (poor workplace domain perceptions) suggests that difficulties in either domain is associated with poorer outcomes for students, and what is required is for students' needs to be met in both areas.

The various groups differed on the outcome variables in expected ways (e.g., Profile 1 with high work congruence and flexibility scored more positively), which supported construct validity of the profiles. Also supporting validity, the four groups showed consistent internal associations. For example, Profile 1, with higher work congruence, also reported higher work flexibility-ability and flexibility-willingness; while Profile 4, with lower work congruence, reported lower levels of work flexibility-ability and flexibility-willingness. These linkages are consistent with perceived boundary congruence (i.e., the attained fit between work and study roles) being associated with perceptions that there are opportunities for the individual to make changes at work and that a willingness to negotiate or make these changes would be seen as acceptable by the employer (Kreiner et al., 2009; Eastgate et al., 2021).

Accordingly, for working students to improve their work-study fit, and thereby allow them to cope better with their competing roles, they should develop skills that enhance their work-study flexibility and congruence. For example, being prepared to raise, and act on, changing working times during high study demand periods, such as before university exams, and negotiating with their universities for increased flexibility, such as increasing flexible access to learning options (e.g., for lectures and laboratory work) to facilitate work, is likely to have broad positive outcomes for functioning in both roles. Our results show that to reap these positive benefits, flexibility and congruence do not need to be more than adequate as Profiles 3 and 1 did not differ significantly on these outcomes, despite Profile 1 have higher work congruence and flexibility than Profile 3.

The results from the study are consistent with fit and boundary congruence theory propositions that structuring the interface between roles to suit the individual and involved others, thereby generating a better fit, is beneficial for the individual. Students in Profile 1 (*high work congruence and flexibility*; 17.5%) and Profile 3 (*balanced*; 65.4%), comprising 82.9% of the sample, met or exceeded these requirements and profited from these arrangements: perceiving fewer job and study demands, less work-study conflict and burnout, and better employability outcomes. In contrast, Profile 2 (*low work congruence/flexibility*; 9.7%) and Profile 4 (*low study congruence*; 7.5%), totalling 17% of the sample, reported work and study boundary difficulties, and experienced higher work and study demands, greater work-study conflict, more burnout, and lower levels of employability optimism.

Last, examining differences on the demographic variables provided some explanation for the differences in profiles and suggested that person and contextual affordances should be considered

when determining the needs of these different groups. The stand-out was Profile 2 (*low work congruence/flexibility*; 9.7%), which included disproportionately more female students than expected by chance, worked longer hours, reported more financial difficulty (than Profiles 1 and 3), and were older (than Profile 3). This suggested that older female students, who were more financially strained and relied more on their work for income, might be experiencing more challenges when negotiating their needs at work to meet study responsibilities. This is consistent with the broader work-life balance literature that has shown that women have more domestic duties (Drummond et al., 2017) and have less access to government and family financial support (Carreira and Lopes, 2021). Thus, facilitating the functioning of students in this Profile would need to include strategies that seek to redress barriers typically confronted by older female students, such as discrimination in the workforce, as well as developing boundary management skills.

4.1. Limitations

First, our study was cross-sectional, and while we drew on widely applied theories of person-environment fit and role boundary congruence, and empirical research has supported that positive boundary experiences generate positive outcomes (Chen et al., 2009; Van Vianen, 2018), we cannot confirm causal relationships, for example, that greater work flexibility-ability and flexibility-willingness lead to more positive future occupational expectations. Studies that collect data over time are needed before strong causal statements can be made. Now that we have shown that different student groups exist based on role boundary management variables, it will be important to clarify this directionality. Longitudinal studies also are needed to test whether the student boundary management strategies are stable over time, and if there are changes, what causes them. Understanding, for example, what experiences enable students to improve their capacity to gain flexibility in the workplace and to act on it, will be important for informing interventions.

Second, future profile analyses might include more direct measures of the integration/segmentation of roles, as this construct plays an important role in boundary management theory (Kreiner, 2006). We assessed the construct indirectly (e.g., boundary flexibility-willingness reflects students' boundary preferences), but including a direct measure might clarify the extent to which role integration/segmentation preferences and actions differentiate students. Also, our sample contained disproportionately more female than male students. While the bivariate correlations between gender and the predictor variables were trivial, we did find an over-representation of females in Profile 2 (*low work congruence/flexibility*) and under-representations in Profiles 1 (*high work congruence/ flexibility*) and 4 (*low study congruence*), suggesting that females might struggle more with work than males, but this needs to be confirmed in studies with a more equal gender balance.

Third, we focused on a small group of outcomes, and other profile differences need to be assessed. For example, our focus was on work-study conflict reduction as a profile correlate, and it will be important to examine ways by which students can manage their boundaries to produce positive "spill-over effects" (Brough and O'Driscoll, 2015), such as work-to-study enrichment and facilitation. Qualitative studies would be helpful here as well.

Last, we examined a small group of contextual factors, largely person-based demographic differences. Future studies need to assess other person and background factors, such as workplace and family support and levels of individual agency (e.g., proactivity), which have been suggested as being important in role congruence (Chu et al., 2021a).

5. Conclusion

We demonstrated the value of deploying a person-centred approach to generate different profiles of working students based on selected boundary management variables. We confirmed that different student groupings could be differentiated from one another, and that these groups differed on a range of important study, work, and career-related variables. Our results suggest that different groups also will require different types of support and intervention, and that treating working students as one homogenous grouping will be less effective for students, and not in the best interest of educational institutions and employers.

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 study was reviewed and approved by both Griffith University Human Research Ethics Committee and University of Southern Queensland Human Research Ethics Committee. Participation in the study was voluntary and anonymous, and submitting a completed questionnaire was taken as an indication of informed consent.

Author contributions

PC, MH, AB, MM, and PB contributed to conception and design of the study. SW and LE organized and managed the databases. SK performed the statistical analysis. PC wrote the first draft of the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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

Publisher's note

References

Araújo, A. M., Gomes, C. M., Almeida, L. S., and Núñez, J. C. (2019). A latent profile analysis of first-year university students' academic expectations. *Ann. Psychol.* 35, 58–67. doi: 10.6018/analesps.35.1.299351

Ashforth, B. E., Kreiner, G. E., and Fugate, M. (2000). All in a day's work. *Acad. Manag. Rev.* 25, 472–491. doi: 10.5465/amr.2000.3363315

Australian Bureau of Statistics. (2021). Education and Work, Australia. Available at: https://www.abs.gov.au/statistics/people/education/education-and-work-australia/latest-release

Barratt, J. M., and Duran, F. (2021). Does psychological capital and social support impact engagement and burnout in online distance learning students? *Internet High Educ* 51, 100821–100829. doi: 10.1016/j.iheduc.2021.100821

Brough, P., and O'Driscoll, M. P. (2015). "Integrating work and personal life" in *Flourishing in Life, Work, and Careers*. eds. R. Burke, K. Page and C. Cooper (Cheltenham: Edward Elgar Publishing), 377–394.

Butler, A. B. (2007). Job characteristics and college performance and attitudes. *J. Appl. Psychol.* 92, 500–510. doi: 10.1037/0021-9010.92.2.500

Campbell, I., and Price, R. (2016). Precarious work and precarious workers. *Econ Labour Relat Rev* 27, 314–332. doi: 10.1177/1035304616652074

Carney, C., McNeish, S., and McColl, J. (2005). The impact of part time employment on students' health and academic performance. *J Further High Educ* 29, 307–319. doi: 10.1080/03098770500353300

Carreira, P., and Lopes, A. S. (2021). Drivers of academic pathways in higher education. *Stud. High. Educ.* 46, 1340–1355. doi: 10.1080/03075079.2019.1675621

Chen, Z., Powell, G. N., and Greenhaus, J. H. (2009). Work-to-family conflict, positive spillover, and boundary management. *J. Vocat. Behav.* 74, 82–93. doi: 10.1016/j.jvb.2008.10.009

Chu, M. L., Conlon, E., and Creed, P. A. (2020). Work-study boundary congruence. *Int J Educ Vocat Guidance* 21, 81–99. doi: 10.1007/s10775-020-09429-0

Chu, M. L., Creed, P. A., and Conlon, E. (2018). Development and initial validation of a work-study congruence scale. *Int J Educ Vocat Guidance* 19, 257–274. doi: 10.1007/s10775-018-9379-0

Chu, M. L., Creed, P. A., and Conlon, E. (2021a). Work–study boundary congruence, contextual supports, and proactivity in university students who work. *J. Career Dev.* 48, 166–181. doi: 10.1177/0894845319830253

Chu, M. L., Creed, P. A., and Conlon, E. (2021b). Recovery resources mediate between work-study boundary congruence and wellbeing and engagement in tertiary students. *J Educ Work* 34, 232–246. doi: 10.1080/13639080.2021.1887828

Cilliers, J., Mostert, K., and Nel, J. (2018). Study demands, study resources and the role of personality in predicting engagement of first-year university students. *S A J Hig Educ* 32, 49–70. doi: 10.20853/32-1-1575

Creed, P. A., French, J., and Hood, M. (2015). Working while studying at university. *J. Vocat. Behav.* 86, 48–57. doi: 10.1016/j.jvb.2014.11.002

Creed, P. A., Hood, M., Brough, P., Bialocerkowski, A., Machin, M. A., Winterbotham, S., et al. (2022). Student work-study boundary flexibility and relationships with burnout and study engagement. *J. Educ. Work* 35, 256–271. doi: 10.1080/13639080.2022.2048250

Creed, P. A., Hood, M., Selenko, E., and Bagley, L. (2020a). The development and initial validation of a self-report job precariousness scale. *J. Career Assess.* 28, 636–654. doi: 10.1177/1069072720920788

Creed, P. A., Sawitri, D. R., Hood, M., and Hu, S. (2020b). Career goal setting and goal pursuit in young adults. *J. Career Dev.* 48, 801–816. doi: 10.1177/0894845319897136

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Drummond, S., O'Driscoll, M. P., Brough, P., Siu, O., Kalliath, T., Riley, D., et al. (2017). The relationship of social support with well-being via work-family conflict. *Hum. Relat.* 70, 544–565. doi: 10.1177/0018726716662696

Eastgate, L., Bialocerkowski, A., Hood, M., and Creed, P. A. (2021). Applying boundary management theory to university students. *Int. J. Educ. Res.* 108, 1–13. doi: 10.1016/j.ijer.2021.101793

European Social Survey. (2010). ESS Round 5 Source Questionnaire. Centre for Comparative Social Surveys. Available at: https://www.europeansocialsurvey.org/data/download.html?r=5

Galbraith, C., and Merrill, G. (2015). Academic performance and burnout. *J. Further High. Educ.* 39, 255–277. doi: 10.1080/0309877X.2013.858673

Greenhaus, J. H., and Beutell, N. J. (1985). Sources of conflict between work and family roles. *Acad. Manag. Rev.* 10, 76–88. doi: 10.2307/258214

Greenhaus, J. H., and Powell, G. N. (2006). When work and family are allies. *Acad. Manag. Rev.* 31, 72–92. doi: 10.5465/AMR.2006.19379625

Gunawan, W., Creed, P. A., and Glendon, A. I. (2019). Development and initial validation of a perceived future employability scale for young adults. *J. Career Assess.* 27, 610–627. doi: 10.1177/1069072718788645

Gunawan, W., Creed, P. A., and Glendon, A. I. (2021). Young adults' perceived future employability. *Int. J. Educ. Vocat. Guidance* 21, 101–122. doi: 10.1007/s10775-020-09430-7

Gustafsson, H., Carlin, M., Podlog, L., Stenling, A., and Lindwall, M. (2018). Motivational profiles and burnout in elite athletes. *Psychol. Sport Exerc.* 35, 118–125. doi: 10.1016/j.psychsport.2017.11.009

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). Multivariate data analysis. A global perspective. *7th* ed. (New Jersey, NJ: Prentice Hall).

Hau, K. T., and Marsh, H. W. (2004). The use of item parcels in structural equation modelling. *Br. J. Math. Stat. Psychol.* 57, 327–351. doi: 10.1111/j.2044-8317.2004.tb00142.x

HSBC. (2018). The Value Of Education. Available at: https://www.us.hsbc.com/content/dam/hsbc/us/en_us/value-of-education/HSBC_VOE5_USA_FactSheet_508r2.pdf

Jung, T., and Wickrama, K. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Soc. Personal. Psychol. Compass* 2, 302–317. doi: 10.1111/j.1751-9004.2007.00054.x

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., and Amick, B. (1998). The Job Content Questionnaire. *J. Occup. Health Psychol.* 3, 322–355. doi: 10.1037/1076-8998.3.4.322

Kossek, E. E., Ruderman, M. N., Braddy, P. W., and Hannum, K. M. (2012). Work-nonwork boundary management profiles. *J. Vocat. Behav.* 81, 112–128. doi: 10.1016/j.jvb.2012.04.003

Kreiner, G. E. (2006). Consequences of work-home segmentation or integration. *J. Organ. Behav.* 27, 485–507. doi: 10.1002/job.386

Kreiner, G. E., Hollensbe, E., and Sheep, M. (2009). Balancing borders and bridges. *Acad. Manag. J.* 52, 704–730. doi: 10.5465/amj.2009.43669916

Kristensen, T. S., Borritz, M., Villadsen, E., and Christensen, K. B. (2005). The Copenhagen burnout inventory. *Work Stress.* 19, 192–207. doi: 10.1080/02678370500297720

Little, T. D., Rhemtulla, M., Gibson, K., and Schoemann, A. M. (2013). Why the items versus parcels controversy needn't be one. *Psychol. Methods* 18, 285–300. doi: 10.1037/a0033266

Marôco, J., and Campos, J. A. (2012). Defining the student burnout construct: a structural analysis from three burnout inventories. *Psychol. Rep.* 111, 814–830. doi: 10.2466/14.10.20.PR0.111.6.814-830

Marsh, H. W., Lüdtke, O., Trautwein, U., and Morin, A. J. S. (2009). Classical latent profile analysis of academic self-concept dimensions. *Struct. Equ. Model.* 16, 191–225. doi: 10.1080/10705510902751010

Matthews, R., and Barnes-Farrell, J. (2010). Development and initial evaluation of an enhanced measure of boundary flexibility for the work and family domains. *J. Occup. Health Psychol.* 15, 330–346. doi: 10.1037/a0019302

McGuire, S. J., Reilly, P. R., Zhang, Y., Mahadavian, B., and Prabhu, V. (2020). Teaching win/win negotiation skills to MBAs: a quasi-experimental examination of a social-exchange based pedagogical approach. *J. Organ. Behav. Educ.* 13, 1–45.

Meeuwisse, M., de Meijer, L. A., Born, M. P., and Severiens, S. E. (2017). The work-study interface. *High. Educ.* 73, 261–280. doi: 10.1007/s10734-016-0012-1

Mounsey, R., VanDehey, M., and Diekhoff, G. (2013). Working and non-working university students. *Coll. Stud. J.* 47, 379–389.

Muchinsky, P. M., and Monahan, C. (1987). What is person-environment congruence? *J. Vocat. Behav.* 31, 268–277. doi: 10.1016/0001-8791(87)90043-1

Niedhammer, I. (2002). Psychometric properties of the French version of the Karasek job content questionnaire. *Int. Arch. Occup. Environ. Health* 75, 129–144. doi: 10.1007/s004200100270

Nylund, K. L., Asparouhov, T., and Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling. *Struct. Equ. Model.* 14, 535–569. doi: 10.1080/10705510701575396

Owen, M. S., Kavanagh, P. S., and Dollard, M. F. (2018). An integrated model of work–study conflict and work–study facilitation. *J. Career Dev.* 45, 504–517. doi: 10.1177/0894845317720071

Salmela-Aro, K., and Upadyaya, K. (2014). School burnout and engagement in the context of demands–resources model. *Br. J. Educ. Psychol.* 84, 137–151. doi: 10.1111/bjep.12018

Spurk, D., Hirschi, A., Wang, M., Valero, D., and Kauffeld, S. (2020). Latent profile analysis. *J. Vocat. Behav.* 120, 103445–103421. doi: 10.1016/j.jvb.2020.103445

Stone, C., Freeman, E., Dyment, J., Muir, T., and Milthorpe, N. (2019). Equal or equitable? *Aust. Int. J. Rural Educ.* 29, 26–40.

Swanson, V., Broadbridge, A., and Karatzias, A. (2006). Earning and learning. *Br. J. Educ. Psychol.* 76, 895–914. doi: 10.1348/000709905X65009

Taylor, A., Raykov, M., and Sweet, R. (2020). Hard Working Students: report of 2018 and 2019 survey findings. University of British Columbia, Vancouver. Available at: http://hdl.handle.net/2429/73374

Thiagarajan, P., Chakrabarty, S., and Taylor, R. D. (2006). A confirmatory factor analysis of Reilly's role overload scale. *Educ. Psychol. Meas.* 66, 657–666. doi: 10.1177/0013164405282452

Van Steenbergen, E. F., Ybema, J. F., and Lapierre, L. M. (2018). Boundary management in action. *Int. J. Stress. Manag.* 25, 267–282. doi: 10.1037/str0000064

Van Vianen, A. E. (2018). Person–environment fit. *Ann. Rev. Organ. Psychol. Organ. Behav.* 5, 75–101. doi: 10.1146/annurev-orgpsych032117-104702

Vîrgă, D., Schaufeli, W. B., Taris, T. W., van Beek, I., and Sulea, C. (2019). Attachment styles and employee performance. *J. Psychol.* 153, 383–401. doi: 10.1080/00223980.2018.1542375

Vosko, L. F. (2011). *Managing the Margins: gender, citizenship and the international regulation of precarious employment.* Oxford: Oxford University Press.

Wan, M. M., Feng, L., Meng, X., Zhai, M., and Konopaske, R. (2022). Working college students' time pressure and work-school conflict. *Psychol. Rep.* 125, 3100–3125. doi: 10.1177/00332941211029621

Waterhouse, P., Samra, R., and Lucassen, M. (2020). Mental distress and its relationship to distance education students' work and family roles. *Distance Educ.* 41, 540–558. doi: 10.1080/01587919.2020.1821606

Winkel, D. E., and Clayton, R. W. (2010). Transitioning between work and family roles as a function of boundary flexibility and role salience. *J. Vocat. Behav.* 76, 336–343. doi: 10.1016/j.jvb.2009.10.011

Zhang, C., Hirschi, A., Li, M., and You, X. (2021). Profiles of calling and their relation to university-to-work transition outcomes. *J. Career Dev.* 49, 788–801. doi: 10.1177/0894845321992873

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Model of psychosocial determinants of health in processes of social exclusion

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The substantial increase in the number of families facing social exclusion in Europe and its direct relationship with health inequities is a challenge for studies approaching the social determinants of health and policies dealing with welfare and social inclusion. We start from the premise that reducing inequality (SDG10), has a value and contributes on other goals such as improving health and well-being (SDG3), ensuring quality education (SDG4), promoting gender equality (SDG5) and decent work (SDG8). In this study, we identify disruptive risk factors and psychological and social well-being factors that influence self-perceived health in trajectories of social exclusion. The research materials used a checklist of exclusion patterns, life cycles and disruptive risk factors, Goldberg's General Health Questionnaire (GHQ-12), Ryff's Psychological Well-being (PWB) Scale and Keyes' Social Well-being Scale. The sample consists of 210 people (aged between 16 and 64 years): 107 people in a situation of social inclusion and 103 people in a situation of social exclusion. The data treatment involved statistical analysis, including correlation study and multiple regression analysis, aimed at developing a model of psychosocial factors that may act as health modulators, considering social factors as predictors in the regression model. The results showed that individuals in the sample, in a situation of social exclusion, have a greater accumulation of disruptive risk factors, and these are related to having fewer psychosocial and cognitive resources to cope with stressful situations: less self-acceptance, less mastery of the environment, less purpose in life, less level of social integration and social acceptance. Finally, analysis showed that in the absence of social integration and purpose in life, self-perceived health statuses decline. This work allows us to use the model obtained as a basis for confirming that there are dimensions of psychological and social well-being that should be considered stress-buffering factors in trajectories of social exclusion. These findings can help design psychoeducational programs for prevention and intervention with the aim of improving psychological adjustment and health states, as well as to promote proactive and reactive policies to reduce health inequalities.

KEYWORDS

social exclusion, health inequity, psychological well-being, health, psychosocial determinants

1. Introduction

Current macroeconomic factors have created new scenarios of inequality and have led many families to situations of social exclusion. Spain has not been left out of these trends and is even above the European average and can therefore be considered one of the most unequal countries in the EU.

This is indicated by multiple data from which we highlight two of those provided by the INE (National Statistics Institute): Spain closed 2021 with 21.7% of its inhabitants at risk of poverty, i.e., people living in households whose income is less than 60% of the national income (Poverty Threshold) and a poverty and social exclusion rate of 27.8%. Regarding inequality, the S80/S20 coefficient (2020 data) indicates that the average income obtained by 20% of the population with the highest the average income obtained by 20% of the population with the lowest income. These and other indicators point to a weakness in our social protection system and are compelling reasons to emphasize the need to address poverty and social exclusion as part of the Sustainable Development Goals in the 2030 Agenda.

In the second half of the 20th century, with the Welfare State in the background, a new epidemiological approach to the Social Determinants of Health (SDH) emerged in line with the postulates of Sigerist (1) and Dunn (2) on the positive nature of health. The first published report that referred to the Social Determinants of Health (SDH) was The Black Report in 1980. It was the first time that a Western government had explicitly exposed the evolution of social inequalities of health in its population. Its findings developed a widespread conviction across Europe of the importance of studying and reporting on social inequalities in different countries.

Over the past 30 years, many authors have recognized the relationship between social determinants of health and how they influence people's daily living conditions, well-being, and health states (3–9). The SDH approach recognizes the role of social inequalities in health and advocates that health states are related to the opportunities and resources that people have according to their social class, gender, territory, or ethnicity (10, 11).

Other authors argue that inequalities occur when the state of health among individuals and populations are inevitable consequences of genetic differences, social and economic conditions, or lifestyle choices. In contrast, these same authors add that, when discussing the concept of inequity, it is closely linked to access to opportunities to maximize health states. It should not be influenced by social position or other socially determined circumstances (8, 12).

Zuckerman, Oliver, Hollingsworth and Austrin (13) stated that those who experienced negative events were at greater risk of manifesting mental health problems and illnesses. On the other hand, other studies recognize that when people are not able to control the resources needed to cope with adversity, the degree of well-being declined (14, 15).

A model related the social structure to different levels of mediation that influence mental health states was proposed by Barrón and Sánchez (16). According to this model, based on the socio-economic and socio-structural position of the person, situations of alienation are produced, which would correspond to the set of social support relationships that enrich the maintenance of the health of individuals and facilitate adaptive behaviors in stressful situations. On the other hand, environmental factors converge with the set of risk factors that can generate stressful situations. On a second level, psychological and psychosocial mediations are recognized through which the psychological effects of stress are modulated: coping styles, self-esteem and social support, which play an important role as modulators in the states of psychological well-being, mental health and in the processes of depression.

The Commission on Social Determinants of Health developed the Social Exclusion Knowledge Network (SEKN) model (Figure 1), which sheds light on the correlation between social inclusion/exclusion and health inequalities (17). The model delves into the unequal power relations that exist in four social dimensions, namely political, social, cultural and economic, and highlights the dynamics that result in differential exposure to health status.

As per the SEKN model, the differences in power exercised by various dimensions, along with the influence and opportunities they provide, result in hierarchical systems of social stratification based on gender, ethnicity, class, caste and age, referred to as biological determinants of health. These systems of stratification and unequal access to power and resources result in differential exposure to health-damaging circumstances, which reduces people's capacity to protect themselves from such circumstances and restrict their access to essential health and other services. This in turn generates health inequalities, which feed back into the system, thereby further increasing inequalities and making people more vulnerable and exposed (17).

The model highlights that the impact of social exclusion processes on health inequalities is both constitutive and instrumental. Simple restriction of participation in social rights or lack of equal opportunities and resources in different dimensions (economic, social, political and cultural) leads to greater negative impacts on health and well-being (17).

Robitschek and Keyes (18) stress the importance of well-being as a protective factor against mental disorders and argue that individuals with high levels of psychological and social well-being have a higher quality of life and improved mental health.

Dodge et al. (19) posit that well-being is determined by the correlation of life challenges and available resources. Based on Headey & Wearing (20), dynamic equilibrium theory of well-being, Hendry & Kloep (21), developmental life model, and Cummins' (22) theory, they define well-being as a state of equilibrium affected by life events and challenges and the set of resources available to the individual. When individuals have more resources than challenges, they experience stable well-being, but when they have more challenges than resources, their well-being becomes unbalanced.

Ryff and Singer (23) understand well-being as an element that values a person's positive state of mind, personal growth, and the ability to meet life's challenges. Lyubomirsky et al. (24) recognize that individuals with high positive health states have better psychological functioning, longer life expectancy, better physical health, and high-quality interpersonal relationships. Blanco and Díaz (25) and Bilbao (26) associate psychological and social well-being with positive mental health and its dimensions as indicators of good psychological and social adjustment.

Therefore, positive states of mind are linked not only to a fuller life but also to a healthier existence, which favors social inclusion (24). This study aims to examine the relationship between psychological and social well-being and social exclusion, identify psychosocial and cognitive resources that hinder optimal psychological functioning in life trajectory processes in social exclusion, and create psycho-educational programs that reinforce healthy buffer factors in health, with a focus on vulnerable groups and reducing health inequalities. The study aims to contribute to achieving the Sustainable Development Goals (SDGs), because we start from the premise that reducing inequality (SDG10), has a value and contributes on other goals such as improving health and well-being (SDG3), ensuring quality education (SDG4), promoting gender equality (SDG5) and decent work (SDG8).

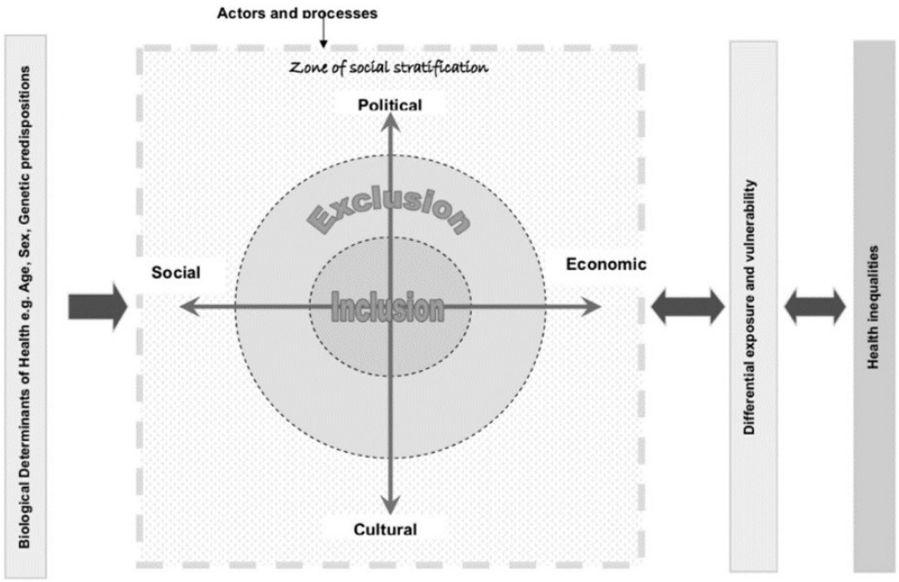

FIGURE 1
The social exclusion knowledge network [WHO (1): p. 38].

2. Materials and methods

2.1. Participants

The study examines a sample of 210 individuals, between the ages of 16 and 64 years. The sample consisted of two groups: 107 individuals who were in a situation of social inclusion, and served as the control group (21.5% men and 78.5% women) and 103 persons in a situation of social exclusion (35% men and 65% women), with an average age of 43 and, regarding their origin, 62.1% of the participants were native and 37.9% were foreign-born.

2.2. Instruments

To assess the variables under study (disruptive risk factors, psychological well-being, social well-being, and self-perceived health), four assessment instruments were administered: 1 checklist, 1 questionnaire and 2 scales.

Checklist of exclusion patterns, life cycles and disruptive risk factors (CDRF) [Diputació (27)]: It contains 60 disruptive risk factors to identify moments of rupture that can affect people in different phases of the life cycle.

The Goldberg's General Health Questionnaire (GHQ-12) (28) is a self-administered screening tool used to measure the psychological well-being and identify the presence of psychological distress in individuals. The GHQ-12 consists of 12 items that measure four domains of distress, including depression, anxiety, social dysfunction, and loss of confidence. Responses are scored on a four-point Likert scale, and the total score ranges from 0 to 36, with higher scores (> 14) indicating greater psychological distress. The GHQ-12 has demonstrated good internal consistency, with Cronbach's alpha coefficients ranging from 0.78 to 0.95 across studies. It has also been found to have good sensitivity and specificity in detecting mental health problems, with cutoff scores ranging from 9 to 12. Furthermore, the GHQ-12 has been validated in different cultural contexts, indicating its cross-cultural validity.

Ryff's Psychological Well-being Scale (PWS) (29): It is a scale that is used to measure psychological well-being through six subscales with twenty-nine items. The response format has scores ranging from one (strongly disagree) to six (strongly agree). The variables they measure are: Self-acceptance (SF), Positive relationships with others (PR), Autonomy (AU), Environmental mastery (EM), Purpose in life (PL) and Personal growth (PG). Subscales show acceptable internal consistency (with values between 0.71 and 0.83), except for Personal growth, which has a lower consistency ($\alpha = 0.68$), so it has not been considered in the present study.

Keyes' Social Well-being Scale (SWS) (25): It is a scale used to assess the perception of the five aspects of the social environment that facilitate psychological well-being: Social integration, Social acceptance, Social contribution, Social actualization and Social coherence. In this study, only the Social integration (SI), Social acceptance (SA) and Social contribution (SC) factors have been used. Two of them subscales have acceptable values of internal consistency: Social acceptance ($\alpha = 0.79$) and Social contribution ($\alpha = 0.80$). Given that in previous studies (25), the Social integration subscale showed a poor internal consistency ($\alpha = 0.67$), we proceeded to calculate the internal consistency with our samples, which was somewhat higher ($\alpha = 0.71$). This value indicates a low correlation between item and total, but acceptable according to the established criteria.

2.3. Procedure

In this study, purposive sampling was used to select the sample of individuals in a situation of social exclusion. This sampling technique involves the intentional selection of participants based on specific

criteria, rather than random selection. In this case, experts selected participants based on defined exclusion and inclusion criteria.

Figure 2 below illustrates the selection process of the sample of individuals in a situation of social exclusion. All participants were at risk of social exclusion based on the AROPE criteria, with 98% of them experiencing severe material deprivation ($n = 101$), 84.5% at risk of relative poverty ($n = 87$), and 62% in a situation of very low labor intensity ($n = 64$). All participants were referred by third sector entities (57%) or social services (43%).

On the other hand, the sampling of the social inclusion sample was non-probabilistic by quotas. This means that participants were chosen based on specific criteria to obtain two samples with comparable socio-demographic profiles.

After that, using a descriptive and correlational cross-sectional design, in the first phase, an informative meeting was held with the managers and coordinators of the institutions and entities collaborating in the study and they were sent an informative dossier containing all the information and the procedure to be followed to refer the participants. Subsequently, members of the research team went to the different institutions to conduct individual interviews lasting between 60–90 min. All participants signed the letter of informed consent. The study complied with the ethical values required in the framework of this research (Figure 3).

2.4. Data analysis

With a mainly quantitative approach, data processing is based on a correlational study. The temporal scope of the research is cross-sectional. Data were analyzed using SPSS 25 statistical software.

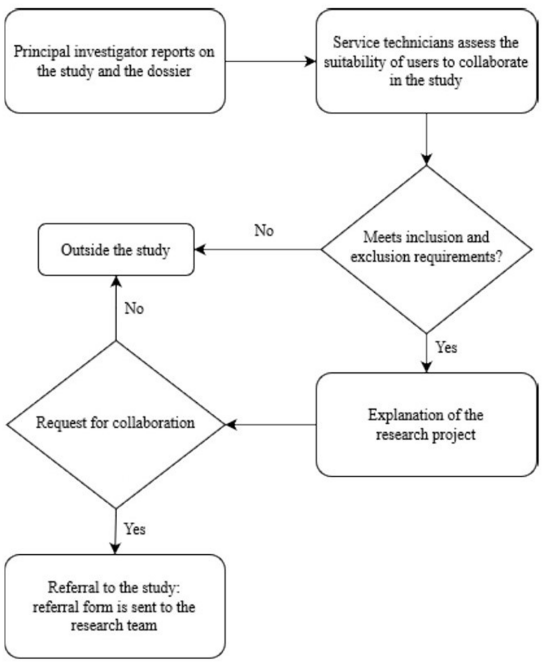

FIGURE 2
Selection procedure for the social exclusion sample.

Firstly, descriptive statistics of the socio-demographic variables and of data obtained from each instrument used for the study were calculated (minimum, maximum, mean, median, and standard deviation).

On the other hand, the Kolmogorov–Smirnov test was performed to check whether the distribution of the samples was normal or not. The results showed that we were working with non-normal samples and therefore non-parametric tests were chosen for further data analysis. Subsequently, significant differences between the two samples were identified using the Mann–Whitney *U* test and Spearman's rho and stepwise multiple regression analyses were carried out in order to analyze the following situations:

- Existence or not of significant differences between the inclusion and social exclusion samples in the scores of self-perceived health, psychological well-being, social well-being, social well-being, psychological well-being and social exclusion.
- Relationship between the variables of psychological well-being, social well-being and self-perceived health in the social exclusion sample.
- Predictive models of self-perceived health through the analysis of the factors of psychological well-being and social well-being in socially excluded people.

3. Results

The results showed that people in a situation of social exclusion, in contrast to socially included people, have a higher accumulation of disruptive risk factors, levels of self-perceived health or a high level of psychological distress and fewer psychosocial and cognitive resources.

Firstly, a descriptive analysis of the disruptive risk factors that arise in the life cycle of socially excluded people was carried out (mean = 28.3, median = 28, minimum = 11, maximum = 47 and standard deviation = 7.7). The most recurrent disruptive risk factors in trajectories of social exclusion are difficulties in paying household expenses (94.2%), as more than 84% have to constantly resort to social benefits in order to subsist. Other disruptive risk factors are also recurrent:

- At some point been unemployed (89.3%)
- Having been hired under precarious conditions (88.3%)
- Lack of the right training to get a better job (86.4%)
- Lack of a solid relational network and having suffered a significant emotional break (83.5%)
- A rupture with their relational network (81.6%)
- Having been unemployed in the long-term (79.6%)
- Lost the job at least once (79.1%)

A sequential pattern of the most common disruptive risk factors can be deduced: people in a situation of social exclusion have greater difficulty in satisfying basic needs and resort to a chronification of social assistance, are constantly in a situation of unemployment or precarious employment or in unstable and temporary jobs, have a strong lack of specialized training and have a very weak or scarce relational network.

Secondly, the Mann–Whitney *U*-test was used to check whether there were significant differences between the two samples studied in relation to self-perceived health, psychological and social well-being. In this sense, Table 1 identifies the variation in the levels of self-perceived health in M1 and M2, obtaining a value ($U = 960.50$, $p = 0.000$), which implies the existence of significant differences between the two samples (M1 and M2). The results show that self-perceived health is worse in people in a situation of social exclusion than in people in a situation of social inclusion.

Tables 2, 3 show the variation of the different factors of psychological and social well-being, obtaining significant scores in all values: self-acceptance ($U = 1{,}981.50$, $p = 0.000$), in positive relationships ($U = 1{,}568$, $p = 0.000$), in autonomy ($U = 3{,}100.50$, $p = 0.000$), in mastery of the environment ($U = 1{,}365$, $p = 0.000$), in personal growth ($U = 3{,}323$, $p = 0.000$), in purpose in life ($U = 1{,}976$, $p = 0.000$), in social integration ($U = 3{,}419.50$, $p = 0.000$), in social acceptance ($U = 1{,}038$, $p = 0.000$) and in social contribution ($U = 4{,}297.50$, $p = 0.006$).

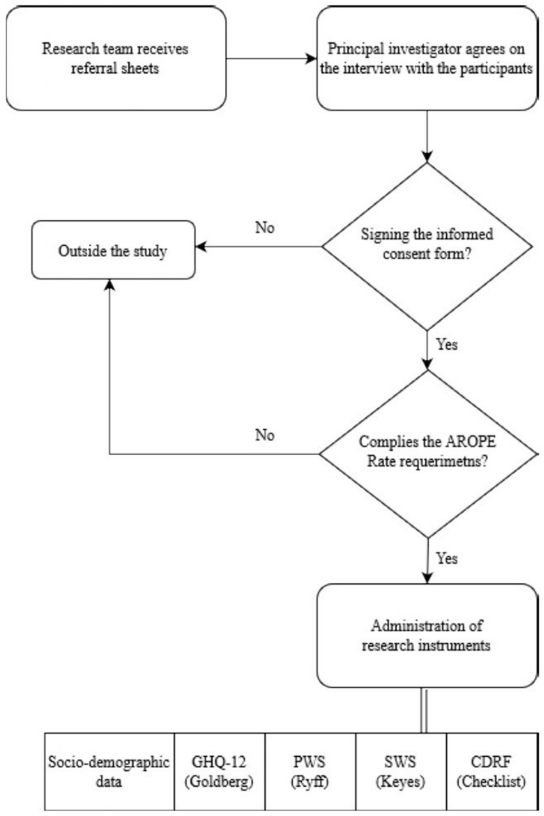

FIGURE 3
Procedure for the exploratory phase of the social exclusion sample.

There are significant differences in all the variables of the psychological well-being scale (Ryff) and social well-being (Keyes). People in a situation of social inclusion (M1) have higher scores of self-acceptances, have a greater capacity to maintain their independence and personal autonomy, show a greater purpose in life and better management of the environment and the potential to grow as a person. People in a situation of social inclusion have more solid and trusting relationships with their social environment. However, people on trajectories of social exclusion (M2) report lower scores in perceived self-acceptance, autonomy, purpose in life, mastery of the environment and capacities for personal growth. In addition, they lack close personal relationships that could enrich their lives. Socially excluded people (M2) have lower levels of trust, acceptance, and positive attitudes toward people in their immediate environment and report feeling like the less active members of the society or community to which they belong.

As can be seen, socially excluded people are characterized by an accumulation of disruptive risk factors, high levels of psychological distress and low scores on psychological and social well-being. To explore, more specifically the relationship between self-perceived health, psychological and social well-being factors and the accumulation of disruptive risk factors in the socially excluded sample, we have calculated Spearman's correlation between all these variables.

Thus, Table 4 shows a positive correlation between the score of the global indicator of self-perceived health and the score of the global indicator of accumulation of disruptive factors ($r_S = 0.234$; $p < 0.05$). There are negative correlations between the overall disruptive risk factor accumulation with three factors of the psychological well-being scale: self-acceptance ($r_S = -0.365$; $p < 0.01$), environmental mastery ($r_S = -0.254$; $p < 0.01$), purpose in life ($r_S = -0.321$; $p < 0.01$) and global psychological well-being scores ($r_S = -0.302$; $p < 0.01$) and with two factors of the social well-being scale: social integration ($r_S = -0.375$; $p < 0.01$) and social acceptance ($r_S = -0.239$; $p < 0.05$).

Therefore, it is concluded that socially excluded people have a higher accumulation of disruptive risk factors and these are related to having fewer psychosocial and cognitive resources to cope with stressful situations: less self-acceptance, less environmental mastery, less purpose in life, lower level of social integration and social acceptance.

Finally, a stepwise multiple regression was carried out to establish a predictive to identify which factors of psychological well-being and social well-being are better predictors of self-perceived health states (Table 5).

The results of the stepwise regression analysis indicate that, in the social exclusion sample, the combination of two factors (low social integration and low purpose in life) implies a higher risk of suffering

TABLE 1 Mann–Whitney *U*-test on self-perceived health in the socially included sample (M1) and in the socially excluded sample (M2).

Sample	*n*	Average range	Range sum	Mann–Whitney's *U*-test	Asymptotic significance (2-tailed)
Self-perceived health					
M1	107	62.98	6,738.50	960.50	0.000
M2	103	149.67	15,416.5		

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TABLE 2 Mann–Whitney's *U*-test on psychological well-being in the socially included sample (M1) and the socially excluded sample (M2).

Sample	*n*	Average range	Range sum	Mann–Whitney's *U*-test	Asymptotic significance (2-tailed)
Self-acceptance					
M1	107	138.48	14,817.50	1981.50	0.000
M2	103	71.24	7,337.59		
Positive relationships with others					
M1	107	142.35	15,231	1,568	0.000
M2	103	67.22	6,924		
Autonomy					
M1	107	128.02	13,698.50	3,100.50	0.000
M2	103	82.10	8,456.50		
Environmental mastery					
M1	107	144.24	15,434	1,365	0.000
M2	103	65.25	6,721		
Personal growth					
M1	107	125.94	13,476	3,323	0.000
M2	103	84.26	8,679		
Purpose in life					
M1	107	138.53	14,823	1,976	0.000
M2	103	71.18	7,332		
General psychological well-being					
M1	107	146.22	15,645.50	1,153.50	0.000
M2	103	63.20	6,509.50		

TABLE 3 Mann–Whitney's *U*-test on social well-being in the socially included sample (M1) and the socially excluded sample (M2).

Sample	*n*	Average range	Range sum	Mann–Whitney's *U*-test	Asymptotic significance (2-tailed)
Social integration					
M1	107	125.04	13,379.50	3,419.50	0.000
M2	103	85.20	8,775.50		
Social acceptance					
M1	107	147.30	15,761	1,038	0.000
M2	103	62.08	6,394		
Social contribution					
M1	107	116.84	12,501.50	4,297.50	0.006
M2	103	93.72	9,653.50		

psychological distress or low self-perceived health, with an explained variance of 18.3%.

4. Discussion

The study aimed to analyze the connection of psychosocial factors (disruptive risk factors, psychological well-being, and social well-being) with self-perceived health. In particular, the research aims to clarify which psychosocial factors influence self-perceived health on the trajectory of social exclusion and being able to recognize buffer factors to reduce social inequalities in health.

Firstly, the high average number of disruptive risk factors in social exclusion trajectories indicates that socially excluded people accumulate disruptive risk factors in different life domains. In fact, the results show that there are axes of inequality and combinations of disruptive risk factors that are more recurrent in the social exclusion sample. These data are in line with the results that showed that the

TABLE 4 Correlation (Spearman's rho) between the accumulation of global disruptive risk factors and self-perceived health, psychological well-being factors, and social well-being factors in people in socially excluded situations.

	Global disruptive risk factors
Self-perceived health (SH)	**0.234***
Psychological well-being factors	
Self-acceptance (SF)	**−0.365****
Positive relationships with others (PR)	−0.070
Autonomy (AU)	−0.183
Environmental mastery (EM)	**−0.254****
Personal growth (PG)	0.003
Purpose in life (PL)	**−0.321****
Global psychological well-being	**−0.302****
Social well-being factors	
Social integration (SI)	**−0.375****
Social acceptance (SA)	**−0.329***
Social contribution (SC)	−0.132

**$p < 0.01$; *$p < 0.05$. $N = 103$.
Bold values indicates the highest values.

TABLE 5 Predictive model of the self-perceived health of people in a situation of social exclusion by analyzing factors of psychological well-being and social well-being.

	Self-perceived health	
	Beta	Beta
Social integration (SI)	−0.381*	−0.266*
ΔR^2 =	0.136	
F (1, 101) =	17.103	
Purpose in life (PL)	–	−0.226*
ΔR^2 =	0.038	
R^2adj.=	0.167	
F (2, 100) =	11.197	

Stepwise multiple regression. *$p < 0.001$. $N = 103$.

main axes to prevent social exclusion should be oriented toward the promotion of occupation insertion, social relations and integration in the community (30–32). This brings us back to the key concepts of community action, social citizenship and governance.

Results also confirmed that the mean psychological health score in the social exclusion trajectories is higher than in the social inclusion sample, with scores higher than 14 points reflecting a low level of self-perceived health. This difference between the two samples is indeed significant. We can corroborate that this sample manifests a very low self-perceived health; therefore, a high level of psychological distress.

Socially excluded people score lower in all the factors of psychological and social well-being, in the same way as Ryff (33) approach: socially excluded people have a lower perception of self-acceptance, less autonomy, less purpose in life, less mastery of their environment and less capacity to develop personal growth. In addition, they do not have close personal relationships that enrich their lives, nor do they feel socially accepted. Similarly, the results obtained show that socially excluded people have less confidence, acceptance and positive attitude toward others and report feeling not very active members of the society or community to which they belong.

No studies have been found that explicitly establish a concrete relationship between the different factors of psychological well-being and the processes of social exclusion as we propose in this study. Even so, in the socio-psychological model of Barrón and Sánchez (16) it is recognized that, just as the social position (influenced by social and environmental factors) influences mental health and depressive states, it also influences psychological well-being. Evidence has been found that people who are socially excluded score low levels of psychological well-being (34). In this way, it is concluded that people in social exclusion trajectories mobilize fewer psychosocial and cognitive resources compared to those in a situation of social inclusion is ratified. As a result, they may have difficulties in maintaining an optimal level of psychological and social well-being.

Secondly, the results have confirmed that the higher the accumulation of disruptive risk factors, the lower the levels of psychological and social well-being and the poorer the self-perceived health. Therefore, it is found that the accumulation of disruptive risk factors is related to levels of self-perceived health. On the other hand, in relation to the psychological and social well-being variables, the accumulation of disruptive risk factors is generally related to the manifestation of less self-acceptance, less mastery of the environment, less purpose in life and lower levels of integration. These results are congruent with those found by Lupien et al. (35) when they argued that the greater the accumulation of life events, the more changes, or readjustments to the stressful situation, and, thus, the greater the impact 0 on psychological adaptive processes and well-being. Along the same lines (36), and Peterson (37) show how residents of disadvantaged areas have lower levels of integration and greater stressful experiences.

Having determined the relationship between self-perceived health scores and psychological and social well-being scores, the last step was to explore whether there were psychological and social well-being factors, as well as axes of inequality, that explain greater variance between self-perceived health in the trajectories of social exclusion and social inclusion.

In the trajectories of social exclusion, it is shown that states of psychological distress are worse when a person is not socially integrated, has no purpose in life and does not have social networks to support them and a sense of social inclusion, states of psychological distress are worse. These findings are consistent with Frankl (38), who stresses that having a strong purpose in life is a very important dimension of human existence to provide people with a sense of vitality, motivation and resilience. Furthermore, Barrón and Sánchez (16) define integration as a positive determinant of health states.

With all these results, a model of psychosocial determinants of health in processes of social exclusion is proposed, highlighting the protective factors of health that can become resilient resources (Figure 4).

Firstly, the set of disruptive risk factors that arise in the life cycle: people in a situation of social exclusion face a greater number of disruptive risk factors, which require different types of response, so they have to mobilize their resources to act effectively in the face of psychosocial stress.

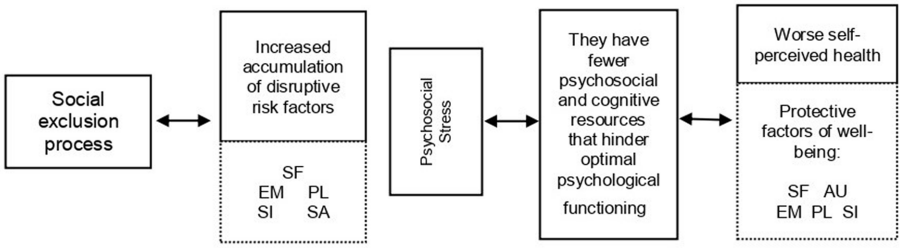

FIGURE 4
Model of psychosocial determinants of health in processes of social exclusion.

Secondly, it is shown that accumulating more risk factors is related to having fewer psychosocial and cognitive resources that hinder good psychological functioning: poor self-acceptance, poor perceived mastery of the environment, lack of direction with life purpose, few or no positive social relationships, and a feeling of non-integration and social acceptance.

The model ends by exposing those factors that should be considered as protective of well-being (self-acceptance, autonomy, mastery of the environment, purpose in life and social integration) and highlights those healthy coping styles (focus on the solution of the problem, positive reappraisal and search for social support), which would favor the improvement of health states, and those that have turned out to be maladaptive (avoidance).

Based on the above, there are elements to affirm that there are psychosocial factors that play a determining role in health states both in trajectories of social inclusion and exclusion. The results of this study modestly add to the incipient line of work that claims the salutogenic approach based on Positive Psychology. This epistemological framework emphasizes the positive aspects of people and those factors that favor adaptation to adverse life events and improve quality of life and well-being (39).

From this, some considerations emerge that should be considered in order to reduce chronic inequalities in the long term:

- Strengthen vocational training and facilitate access to higher education by generating new measures to reconcile work, studies, and family.
- Generate a strong productive fabric to avoid low-skilled and precarious jobs.
- Promote community work to strengthen networks, relationships, and community ties.
- Promote and improve the prevention and promotion of emotional wellbeing.
- Increase and improve care for people with emotional distress and psychosocial risk factors to avoid or minimize the appearance of mental and physical health problems.

It is necessary to break with the economistic view of social exclusion and to axiomatize the relational and salutogenic dimension of social exclusion and well-being in policies and interventions to reduce social inequalities in health (40).

On a practical level, the results indicate the need to enhance the dimensions that have proved to be revealing in the proposed model and have the potential to become good resilient resources for social intervention specialists. Based on these results, the proposal is to design psychoeducational interventions and projects based on health promotion, cognitive restructuring, and acceptance techniques, strengthening of social support and social relationships, which includes and encourages the role of community action and the promotion of emotional well-being.

All these results are consistent with the Social Determinants of Health approach in recognizing the role of social inequalities in health and in finding a close relationship between health status and people's opportunities and resources according to their class, gender, territory or ethnicity (8) and the SEKN model, that best explains the relationship between social inclusion - social exclusion and social inequality in health. This model focuses on the unequal power relations established in the four social dimensions (political, social, cultural and economic) and highlights the dynamics that can generate processes of differential exposure in mental health conditions.

Similarly, the conceptual model of the production of health inequalities by (41) and the socio-psychological model by Barrón and Sánchez (16) show how social position is influenced by social and environmental factors and these, in turn, are related to psychological and psychosocial mediating factors that influence mental health states and well-being.

It is assumed that the sample size (M1 $n = 107$; M2 $n = 103$) is the main limitation of the study. However, the sample size is larger than other studies published with similar characteristics. Studies that analyze the population in social exclusion in general are non-existent, and those with a large sample are very rare. Mostly, studies are based on specific groups and profiles and are usually focused on specific issues.

Moreover, it could be very interesting to propose a longitudinal design or use the method of time series to compare moments and generational cohorts, verify the influence of different environmental contexts, and study evolutionary changes.

Although predictive models do not establish a causal link between psychological and social well-being variables and coping styles, it has been found that there are factors of psychological and social well-being and coping styles, with significant levels of variance, that should be considered as stress-buffering factors in trajectories of social inclusion and exclusion.

In conclusion, the results are intended to guide anticipatory policies and implement reactive policies or strategies with innovative

bases to contribute to achieving the Sustainable Development Goals (SDGs), more specifically; in advocacy to address poverty and social exclusion, work to reduce inequality (SDG10), impact on improving health and well-being, ensure quality education (SDG4), promote gender equality (SDG5) and decent work (SDG8).

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 to participate in this study was provided by the participants' legal guardian/ next of kin.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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.

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References

1. Sigerist H. *Medicine and human welfare*. New Haven: Yale University Press (1941).

2. Dunn HL. High-level wellness for man and society. *Am J Public Health Nations Health*. (1959) 49:786–92. doi: 10.2105/AJPH.49.6.786

3. Borrell C, Benach J. *Les desigualtats en la salut a Catalunya*. Barcelona: Mediterrània (2003).

4. Bouchard L, Albertini M, Batista R, Montigny J. Research on health inequalities: a bibliometric analysis (1966-2014). *Soc Sci Med*. (2015) 141:100–8. doi: 10.1016/j.socscimed.2015.07.022

5. Krieger N. Genders, sexes, and health: what are the connections-and why does it matter? *Int J Epidemiol*. (2003) 32:652–7. doi: 10.1093/ije/dyg156

6. Marmot M, Wilkinson G. Psychosocial and material pathways in the relation between income and health: a response to lynch et al. *Br Med J*. (2001) 322:1233–6. doi: 10.1136/bmj.322.7296.1233

7. Solar O, Irwin A. A conceptual framework for action on the social determinants of health In: WHO (World Health Organization) *Social determinants of health discussion, paper 2 (policy and practice)*. Geneva: World Health Organization (2010)

8. Whitehead M, Dahlgren G. *Conceptos y principios de la lucha contra las desigualdades sociales en salud: Desarrollando el máximo potencial de salud para toda la población*. Madrid: Ministerio de Sanidad y Política Social (2010).

9. Word Health Organization (WHO). *Subsanar las desigualdades en una generación: alcanzar la igualdad sanitaria actuando sobre los determinantes sociales de la salud*. Ginebra: WHO (2008).

10. Chung EK, Siegel BS, Garg A, Conroy K, Gross RS, Long DA, et al. Screening for social determinants of health among children and families living in poverty: a guide for clinicians. *Curr Probl Pediatr Adolesc Health Care*. (2016) 46:135–53. doi: 10.1016/j.cppeds.2016.02.004

11. García-Altés A, Rodríguez-Sanz M, Pérez G, Borell C. Desigualdades en salud y en la utilizacion y el desempeño de los servicios sanitarios en las Comunidades Autonomas. *Cuadernos económicos de ICE*. (2008) 75:115–28. doi: 10.32796/cice.2008.75.5933

12. Synovec CE, Aceituno L. Social justice considerations for occupational therapy: the role of addressing social determinants of health in unstably housed populations. *Work*. (2020) 65:235–46. doi: 10.3233/WOR-203074

13. Zuckerman LA, Oliver JM, Hollingsworth HH, Austrin HR. A comparison of life events scoring methods as predictors of psychological symptomatology. *J Hum Stress*. (1986) 12:64–70. doi: 10.1080/0097840X.1986.9936769

14. Eronen S, Nurmi JE. Life events, predisposing cognitive strategies and well-being. *Eur J Personal*. (1999) 13:129–48. doi: 10.1002/(SICI)1099-0984(199903/04)13:2<129::AID-PER323>3.0.CO;2-9

15. Suh E, Diener E, Fujita F. Events and subjective well-being: only recent events matter. *J Pers Soc Psychol*. (1996) 70:1091–102. doi: 10.1037/0022-3514. 70.5.1091

16. Barrón A, Sánchez E. Estructura social, apoyo social y salud mental. *Psicothema*. (2001) 13:17–23.

17. Word Health Organization (WHO). (2008). Understanding and tackling social exclusion. Available at: https://www.who.int/social_determinants/knowledge_networks/final_reports/sekn_final%20report_042008.pdf (Accessed February 5, 2023).

18. Robitschek C, Keyes C. The structure of Keyes' model of mental health and the role of personal growth initiative as a parsimonious predictor. *JONNPR*. (2009) 5:81–90. doi: 10.19230/jonnpr.3215

19. Dodge R, Daly AP, Huyton J, Sanders LD. The challenge of defining wellbeing. *Int J Wellbeing*. (2012) 2:222–35. doi: 10.5502/ijw.v2i3.4

20. Headey BW, Wearing AJ. Personality, life events and subjective well-being: toward a dynamic equilibrium model. *J Pers Soc Psychol*. (1989) 57:731–9. doi: 10.1037/0022-3514.57.4.731

21. Hendry LB, Kloep M. *Lifespan development: Resources, challenges and risks*. London: Thomson Learning (2002).

22. Cummins R. Subjective wellbeing, homeostatically protected mood and depression: a synthesis. *J Happiness Stud*. (2010) 11:1–17. doi: 10.1007/s10902-009-9167-0

23. Ryff C, Singer B. Know thyself and become what you are: an eudiamonic approach to psychological wellbeing. *J Happiness Stud*. (2008) 9:13–39. doi: 10.1007/s10902-006-9019-0

24. Lyubomirsky S, King L, Diener E. The benefits of frequent positive affect: does happiness lead to success? *Psychol Bull*. (2005) 131:803–55. doi: 10.1037/0033-2909.131.6.803

25. Blanco A, Díaz D. El bienestar social: su concepto y medición. *Psicothema*. (2005) 17:582–9.

26. Bilbao M. (2008). Creencias Sociales y Bienestar: valores, creencias básicas, impacto de los hechos vitales y crecimiento psicológico [Ph.D. thesis]. Universidad del País Vasco.

27. Diputació de Barcelona. *Guia Metodològica Revisada dels Plans Locals d'Inclusió i Cohesió Social. Col·lecció documents de treball. Sèrie Benestar Social*. Barcelona: Diputació de Barcelona (2012).

28. Rocha K, Pérez K, Rodríguez-Sanz M, Borrell C, Obiols JE. Propiedades psicométricas del instrumento de cribado general. Health Questionnaire (GHQ-12) en población general española. *Int J Clin Health Psychol*. (2011) 11:125–39.

29. Díaz D, Rodríguez-Carvajal R, Blanco A, Moreno-Jiménez B, Gallardo I, Valle C, et al. Adaptación española de las escalas de bienestar psicológico de Ryff. *Psichotema*. (2006) 18:572–7.

30. Castel R. *Metamorfosis de la cuestión social. Una crónica del salariado*. Buenos Aires: Paidós (1997).

31. Paugam S. *Las formas elementales de la pobreza*. Madrid: Alianza (2007).

32. Tezanos JF. La exclusión social en España. *Temas para el Debate*. (1998) 49:63–97.

33. Ryff C. Hapiness is everything, or is it? Explorations on the meaning of psycological well-being. *J Pers Soc Psychol*. (1989) 57:1069–81. doi: 10.1037/0022-3514.57.6.1069

34. Escarbajal-Frutos A, Izquierdo-Rus T, López-Martínez O. Análisis del bienestar psicológico en grupos en riesgo de exclusión social. *Anales de Psicología*. (2014) 30:541–8. doi: 10.6018/analesps.30.2.156591

35. Lupien S, King S, Meaney M, Mcewen B. Can poverty get under your skin? Basal cortisol levels and cognitive function in children from low and high socioeconomic status. *Dev Psychopathol*. (2001) 13:653–76. doi: 10.1017/S0954579401003133

36. Gracia E, Herrero J. La comunidad como fuente de apoyo social: evaluación e implicaciones en los ámbitos individual y comunitario. *Revista Latinoamericana de Psicología*. (2006) 38:327–42.

37. Peterson C. *A primer in positive psychology*. New York: Oxford University Press (2006).

38. Frankl V. *El hombre en busca de sentido*. Barcelona: Herder (2005).

39. Seligman MEP, Csikszentmihalyi M. Positive psychology: an introduction. *Am Psychol*. (2000) 55:5–14. doi: 10.1037/0003-066X.55.1.5

40. De La Guardia Gutiérrez MA, Ruvalcaba Ledezma JC. La salud y sus determinantes, promoción de la salud y educación sanitaria. *JONNPR*. (2020) 5:81–90. doi: 10.19230/jonnpr.3215

41. Diderichsen F, Hallqvist J. Social inequalities in health: some methodological considerations for the study of societal position and social context In: B Arve-Parès, editor. *Inequality in health–Swedish perspective*. Stockholm: Swedish Council for Social Research (1998). 25–39.

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Self-objectification and career aspirations among young Chinese women: the roles of self-esteem and career decision-making self-efficacy

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This study explored the relationship between self-objectification and career aspirations among young women from the perspective of objectification theory. A sample of 439 Chinese undergraduate women completed questionnaires on self-objectification, self-esteem, career decision-making self-efficacy, and career aspirations. The results revealed that self-objectification was negatively correlated with self-esteem, career decision-making self-efficacy, and career aspirations. Self-esteem and career decision-making self-efficacy, both independently and serially, mediated the association between self-objectification and career aspirations. These results provide a better understanding of the negative consequences of self-objectification for career aspirations.

KEYWORDS

self-objectification, career aspirations, self-esteem, career decision-making self-efficacy, Chinese women

Introduction

Career aspirations reflect the extent to which an individual aspires to leadership positions and further education in their career (O'Brien et al., 2000). Research has shown that the levels for women's career aspirations are significantly lower than those for men (e.g., Fritz and van Knippenberg, 2017), and low career aspirations hinder women's career development and the realization of gender equality in the workplace (Crompton and Lyonette, 2011; Huang et al., 2021). The external environments, including family and work environments, are factors that influence women's career aspirations (Pas et al., 2008; Fritz and van Knippenberg, 2017; Al-Bahrani et al., 2021). Recent studies have found that a social culture that values appearance also affects women's career aspiration (Wang et al., 2020; Huang et al., 2021). These studies have also provided a new perspective for research in the field of women's career development, suggesting that the sociocultural focus and gaze on women's bodies may subtly affect women's judgment of self-worth and thus affect their career development. Research has found that in this cultural atmosphere of emphasizing appearance, women tend to internalize ideal beauty or values emphasizing appearance, and then they pay more attention to their appearance, measure their value by appearance, and form self-objectification (Fredrickson and Roberts, 1997). Self-objectification causes women to define and evaluate themselves more based on observable physical attributes (e.g., weight) and ignore unobservable traits (e.g., health), which may also affect women's career development (Daniels et al., 2020). Therefore, drawing on this perspective, this study explored the mechanisms through which self-objectification influences the career aspirations of female college students.

Self-objectification and career aspiration

Fredrickson and Roberts (1997) argued that women are objectified when their bodies are perceived to represent them or when their value is equated with their bodies. According to objectification theory, by living in an environment that values appearances, women internalize an observer's view of themselves, treating their bodies as objects based on appearance evaluation; this is called self-objectification (Fredrickson and Roberts, 1997). Studies have shown that a culture of objectifying women that focuses excessively on appearance constructs a negative and unsupportive environment for women's development (Calogero, 2013; Huang et al., 2021) and limits their expectations and career choices (Daniels et al., 2020). For example, girls who played appearance-focused games (e.g., sexy Barbie dolls) reported fewer career choices and more identification with female careers than girls who played appearance-less games (e.g., Mrs. Potato Head) (Sherman and Zurbriggen, 2014; Slater et al., 2017). Similarly, in a sample of Chinese female college students, Huang et al. (2021) found that the more those young women agreed about the importance of physical attractiveness, the lower their reported levels of career aspirations. Self-objectification, as a result of the internalization of culturally driven objectification, may also have a negative impact on women's career aspirations. Studies have found that self-objectifying women are used to constantly monitoring their bodies and paying more attention to their appearance; thus, they are more inclined to focus their time and energy on improving their physical attractiveness, while ignoring their own personality, strengths, and interests (Fredrickson and Roberts, 1997; Cao et al., 2021), which in turn may lower their career aspirations (Huang et al., 2021). An experimental study found that women who were objectified by male interactive partners experienced greater states of self-objectification and diminished career aspirations (Garcia et al., 2016). We therefore proposed that self-objectification would be negatively correlated with career aspirations (Hypothesis 1).

Self-esteem as a potential mediator

Self-esteem is based on self-evaluation, and is a positive or negative attitude towards specific things related to the self (Rosenberg, 1965). A culture of objectification tells women that their body or their appearance is their most important attribute, and that those who are closer to realizing the cultural ideal of beauty are more valuable (Fredrickson and Roberts, 1997). Women engaged in self-objectification are more likely to evaluate themselves negatively through comparison with social standards or ideals; therefore, they tend to experience low self-esteem (Choma et al., 2010; Guo and Wu, 2021). Studies have shown that self-esteem can positively predict career aspirations (Castro and Armitage-Chan, 2016; Khampirat, 2020). Therefore, we proposed that self-objectification may be related to lower career aspirations via decreased self-esteem (Hypothesis 2).

Career decision-making self-efficacy as a potential mediator

Career decision-making self-efficacy refers to an individual's belief in their ability to achieve career results (Taylor and Betz, 1983). Studies have shown that low self-efficacy expectations are an important factor limiting women's career choices (Betz and Hackett, 1981). Generally, women tend to lack a strong expectation of personal efficacy in many career-related behaviors, thus failing to fully realize their abilities and talents in career pursuits (Betz and Hackett, 1981; Beyer, 2014). For example, traditional views on gender roles and early learning experience limit women's expectations of success and reduce their sense of professional self-efficacy, thus narrowing the scope of female career exploration and making them avoid choosing non-traditional female career fields, especially those involving mathematics, science, mechanical operation, and similar fields (Betz and Hackett, 1981; Taveira, 1997). From a cognitive perspective, some scholars believe that self-objectifying girls focus on body monitoring and thus consume their cognitive resources, thereby limiting their cognitive ability for other activities (Fredrickson et al., 1998), reducing their overall sense of self-efficacy. Studies have found that self-objectification is significantly negatively correlated with women's self-efficacy (Gapinski et al., 2003; Adams et al., 2017). An experiment has shown that self-objectification induced by trying on swimsuits reduced women's intrinsic motivation and self-efficacy (Gapinski et al., 2003). Career decision self-efficacy is a kind of self-efficacy, and we speculate that self-objectification may be related to low career decision-making self-efficacy. Research has shown that career decision self-efficacy serves as a positive predictor of career aspirations (Gregor et al., 2020; Al-Bahrani et al., 2021). Accordingly, we proposed that self-objectification may be related to lower career aspirations via decreased career decision-making self-efficacy (Hypothesis 3).

Self-esteem and career decision-making self-efficacy

The above theoretical analysis shows that self-esteem and career decision-making self-efficacy may be the effective mediating variables between self-objectification and career aspirations. There is also a close relationship between self-esteem and career decision-making self-efficacy. A meta-analysis of career decision-making self-efficacy of Chinese college students shows that self-esteem has the highest correlation with career decision-making self-efficacy ($r = 0.63$), and high self-esteem helps to improve individual career decision-making self-efficacy (Li et al., 2016). Studies have shown that self-esteem can positively predict college students' career decision-making self-efficacy (Thompson et al., 2019; Xu et al., 2021). Individuals with high self-esteem are more inclined to consider their own future and believe that they can solve work-related problems, which increases their confidence in career decisions (Xu et al., 2021); thus, they are more likely to have higher career aspirations (Al-Bahrani et al., 2021). Accordingly, we proposed that self-objectification may be related to lower career aspirations via decreased self-esteem and career decision-making self-efficacy (Hypothesis 4).

Methods

Participants and procedures

Our sample consisted of 439 women recruited from two universities in Henan, China. Participants ranged in age from 16 to 21 years ($M = 18.26$, $SD = 0.83$), and 97.49% were of Han ethnicity.

The study and the data collection procedure received approval from the ethics committees of the authors' affiliate institutions. Participants were recruited from various elective psychology courses and received extra credit for their participation. Participants completed an online survey in Mandarin via Wenjuanxing (a Chinese survey website). Informed consent forms were submitted online before filling out the questionnaire.

Measures

Self-objectification via body surveillance

Self-objectification was measured using the body surveillance subscale of the objectified body consciousness scale (OBCS, McKinley and Hyde, 1996). The OBCS includes three factors: body surveillance (habitually monitoring of one's own body and viewing it as an outsider), body shame (feeling shame when the body does not conform to cultural beauty standards), and control beliefs (the belief that individuals can control how they look given enough effort) (McKinley and Hyde, 1996). Within the framework of objectification theory, the phenomenon of self-objectification enhances the perception that appearance is important to women, leading women to habitually monitor their own bodies from an outsider's perspective (Fredrickson and Roberts, 1997). It can be seen that self-objectification is a similar construct to body surveillance proposed by McKinley and Hyde (1996). Therefore, the body surveillance subscale of the objectified body consciousness scale is widely used to measure women's self-objectification and has been proved to have good reliability and validity (Moradi and Huang, 2008; Daniels et al., 2020). This subscale contains eight items that assess the frequency with which participants monitor their physical appearance. Participants responded to each item on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale has satisfactory reliability and validity in Chinese female college students (Jackson and Chen, 2015). In this study, α =0.79.

Self-esteem

Consistent with previous studies (Choma et al., 2010; Guo and Wu, 2021), self-esteem was measured using the 10-item Rosenberg Self-esteem Scale (Rosenberg, 1965). Participants responded to each item on a four-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The Chinese version showed satisfactory reliability and validity in Chinese samples (Wang et al., 1998). In this study, $\alpha = 0.87$.

Career decision-making self-efficacy

Career decision-making self-efficacy was measured using the career decision-making self-efficacy scale-short form (CDSES-SF) (Betz et al., 1996). The scale comprises 25 items, with 5 items in each of 5 dimensions: accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem solving. Participants responded to each item on a five-point Likert scale ranging from 1 (*no confidence at all*) to 5 (*complete confidence*). The Chinese version showed satisfactory reliability and validity in Chinese samples (Kuang et al., 2011). As these five sub-scales were highly correlated with each other ($r = 0.68$ to 0.79, $p < 0.001$), in light of previous studies (Kuang et al., 2011), we combined all the items into a global indicator of career decision-making self-efficacy (α =0.94).

Career aspirations

Career aspirations were measured using the 8-item career aspiration scale (Gray and O'Brien, 2007). Participants responded to each item on a five-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). The Chinese version showed satisfactory reliability and validity in Chinese samples (Huang et al., 2021). In this study, $\alpha = 0.73$.

Data analysis

To test Hypothesis 1, we used SPSS version 20 to analyze the internal consistency, descriptive statistics, and correlations between the variables. To test Hypotheses 2–4, we first used structural equation modeling to test the hypothesized model. Next, we used PROCESS Model 6 (Hayes, 2013) to further test the significance of each mediation effect proposed in Hypotheses 2, 3, and 4. Bootstrapping analyses were used with 5,000 bootstrap samples to compute 95% bias-corrected.

Results

The post-hoc power analysis using G*Power revealed that the large sample ($N = 439$, effect size = 0.3) provided sufficient power (around 100%) to detect key findings, using an alpha level of 0.05.

Table 1 shows the means, standard deviations, and correlations for all variables. Considering Hypothesis 1, the results show that self-objectification was negatively correlated with self-esteem, career decision-making self-efficacy, and career aspiration.

Testing for mediation effect

To further test the validity of our model, some alternative mediation models were also tested: complete mediation model (M1), parallel multiple mediator model (M2), and chain mediation model (M3). The complete mediation model (M1) refers to self-objectification that affects career aspirations through self-esteem and career decision-making self-efficacy; parallel multiple mediator model (M2) is based on (M1), adding a direct impact path of self-objectification on career aspirations; the chain mediation model (M3) is a direct influence path of adding self-esteem to career decision-making self-efficacy on the basis of (M2). Results indicated a poor fit of the data to the three models (M1: $\chi^2/df = 81.93$, CFI = 0.46, GFI = 0.87, TLI = −0.62, SRMR = 0.17, RMSEA = 0.43; M2: $\chi^2/df = 162.57$, CFI = 0.46, GFI = 0.87, TLI = −2.23, SRMR = 0.17, RMSEA =0.61; M3: $\chi^2/df = 0.00$, CFI = 1.00, GFI = 1.00, TLI = 0.00, SRMR = 0.00, RMSEA = 0.34), and the path from self- objectification to career aspirations is not significant (M1: $p = 0.26$; M2: $p = 0.27$). We deleted the non-significant paths and re-analyzed the model 3 (the chain mediation model); the fit statistics indicated a good fit to the data ($\chi^2/df = 1.29$, CFI = 0.99, TLI = 0.99, SRMR = 0.02, RMSEA = 0.03). This finding corroborates the validity of our hypothesis.

The regression results of the sample confirmed that: (1) self-objectification negatively predicted self-esteem ($\beta = -0.27$, $p < 0.001$); (2) self-esteem had a positively prediction on career decision-making self-efficacy ($\beta = 0.55$, $p < 0.001$); and (3) career decision-making

TABLE 1 Descriptive statistics and correlation among study variables (N=439).

Variables	M (SD)	Min	Max	Range	1	2	3	4
1.Self-objectification	4.00 (0.91)	1.00	6.38	1–7	–	–	–	–
2. Self-esteem	2.96 (0.44)	1.60	4.00	1–4	−0.27**	–	–	–
3. Career decision-making self-efficacy	3.13 (0.54)	1.56	5.00	1–5	−0.30**	0.59**	–	–
4. Career aspirations	2.53 (0.53)	0.75	4.00	0–4	−0.17*	0.30**	0.36**	–

*p < 0.05, **p < 0.01, ***p < 0.0001.

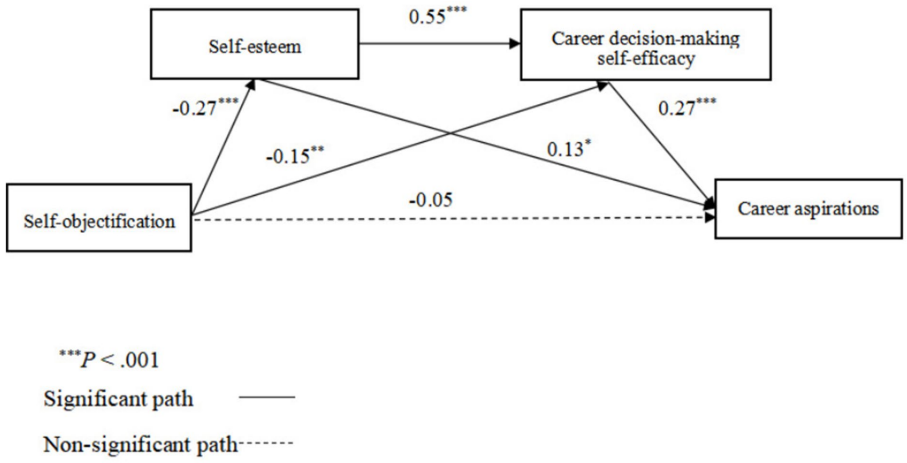

FIGURE 1
Hypothesized and final model with standardized path coefficients.

self-efficacy positively predict career aspirations (β = 0.27, p < 0.001). Then, self-esteem and career decision-making self-efficacy were added in, self-objectification did not predict career aspirations (β = −0.005, p = −1.19).

The mediation analysis showed that self-esteem mediated the association between self-objectification and career aspirations [indirect effect =0.020, SE = 0.010, 95% CI (−0.041, −0.001)] (supporting Hypothesis 2), as did career decision-making self-efficacy [indirect effect =0.023, SE = 0.009, 95% CI (−0.043, −0.009)] (supporting Hypothesis 3). The results also supported the serial mediating roles of self-esteem and career decision-making self-efficacy in the association between self-objectification and career aspirations [indirect effect = −0.024, SE =0.007, 95%CI (−0.038, −0.012)], supporting Hypothesis 4 (see Figure 1).

Discussion

Although previous studies have found that a culture focused on appearance has a negative impact on young women's career aspirations (Wang et al., 2020; Huang et al., 2021), few studies have directly explored the relationship between self-objectification and career aspirations directly, and the mechanism connecting the two remains unclear. This study examined this relationship and found that self-objectification is significantly negatively correlated with career aspirations. This result is consistent with previous studies and with our hypothesis, indicating that women with higher levels of self-objectification are more likely to have lower career aspirations (Garcia et al., 2016). Self-objectifying women pay more attention to their appearance and ignore their inner qualities (Fredrickson and Roberts, 1997; Cao et al., 2021); they may be less likely to explore their interests, values, and careers scope, which can inhibit their career aspirations. A culture of objectification also overstates the value of women's appearance and body (Huang et al., 2021); for example, in the media, a perfect appearance is often associated with personal value and success (Luo, 2012). A women's beautiful body is regarded as a form of capital or competitive advantage to obtain more social resources and opportunities to change one's life (Calogero, 2013; Wang et al., 2020). In such a culture, women tend to experience greater employment pressure and perceive fewer opportunities, reducing their career aspirations (Huang et al., 2021). Women who experience self-objectification are more likely to be affected by this culture (Calogero, 2013), as the unattainably perfect body may make them feel that they lack value or competitiveness, which may also curb their career aspirations.

As predicted, self-esteem mediates the relationship between self-objectification and career aspirations. Self-objectifying women tend to constantly monitor their bodies and are more likely to be compared to society's ideal standards of beauty. The gap between the two leads to negative self-evaluation and thus such women tend to experience low self-esteem (Choma et al., 2010; Guo and Wu, 2021). Low self-esteem in turn may make

women take a less positive view of their learning and skill development, which can prevent them from pursuing leadership roles, thus limiting their career aspirations (Castro and Armitage-Chan, 2016). Although the self-esteem scores of women in this study were not as low ($M = 2.96$, SD = 0.44), they were similar to those found in previous studies. For example, in the study of Tang et al. (2019), the average self-esteem score of Chinese female college students was 2.95 (SD = 0.42), and in the study of Choma et al (2010), the average self-esteem score of Canadian female students was 3.15 (SD = 0.48). The reason why the level of self-esteem is not low enough may be because the personal self-value assessment is complex and may be affected by many factors (Fang et al., 2016). In this study, we pay more attention to the relationship between various variables and self-esteem, especially the negative impact of self-objectification on female self-esteem. Our results demonstrated a negative correlation between self-objectification and self-esteem, while low self-esteem further affects women's career aspirations.

Career decision-making self-efficacy also mediated the relationship between self-objectification and career aspirations. This result extends the negative impact of self-objectification on women's self-efficacy to the career field (Adams et al., 2017). Self-objectifying women's habitual monitoring of their bodies occupies psychological resources, which makes it difficult for them to focus on other things (Fredrickson et al., 1998); this may reduce their self-efficacy. Self-objectification can also lead women to ignore the development of or dramatically underestimate their abilities (Loughnan et al., 2017; Cao et al., 2021). This neglect and underestimation of their abilities may reduce women's confidence in completing certain activities or behaviors, which in turn may lead to low career decision-making self-efficacy. Individuals with low career decision-making self-efficacy tend to show lower career aspirations (Al-Bahrani et al., 2021). Women with self-objectification are thus more likely to show low self-efficacy in career decision-making, which limits their career aspirations.

Finally, our findings add value to the existing literature by suggesting the serial mediation of self-esteem and career decision-making self-efficacy in the relationship between self-objectification and career aspiration. This result provides possible pathways to explain the relationship between self-objectification and career aspiration. Based on objectification theory, self-objectifying women regard their physical appearance as the criterion for judging their own value (Fredrickson and Roberts, 1997). From this perspective, self-objectifying women are more likely to exhibit lower self-esteem and self-worth (Adams et al., 2017; Guo and Wu, 2021), as they are unable to fully and accurately evaluate themselves. They may then have more difficulties and exhibit lack of confidence in career decision-making, which ultimately undermines their career aspirations. This finding helps to deepen our understanding of the negative effects of self-objectification on women's career development.

Implications for practice

First, our results enrich the existing research on objectification theory, indicating that self-objectification has a wide range effects and may affect many aspects of women's lives. Second, this study broadens the horizons for research on women's careers and provides evidence that objectifying women is a form of gender bias that creates a negative environment for women's development (Calogero, 2013; Calogero and Tylka, 2014; Huang et al., 2021). This cultural pressure that encourages women to pursue beauty rather than achievement promotes women viewing themselves from the perspective of self-objectification. This limits women's roles and further consolidates their vulnerable position in the gender hierarchy (Calogero, 2013). Society and the media should thus reduce the objectification of and present more diverse female images to create a healthy environment for female development. Finally, this study provides further evidence that self-esteem and career decision-making self-efficacy mediate how self-objectification affects women's career ambition, which has implications for the career planning education. Female college students could be encouraged, for example, to focus on the development of their inner qualities and abilities to improve their self-esteem and sense of self-worth, thus promoting better career development.

Limitations

The limitations of the current study are as follows. First, this was a cross-sectional study, meaning that we cannot reveal the causal relationship between the variables; experimental and longitudinal studies are therefore needed. Second, our results are based on responses from Chinese female college students, which mean that the results may not be generalizable to women from other countries. Future studies should thus expand the range of their samples to improve the external validity of the results. Finally, this study only discussed the mediating mechanism between self-objectification and career aspirations, without involving individual differences. A study has found a significant positive relationship between body surveillance and career aspirations, which is inconsistent with our findings (Wang et al., 2020). The "beauty as currency" hypothesis holds that beauty can be used as the social currency of women (Calogero et al., 2017). Thus, one possible explanation is that for highly attractive self-objectifying women, beauty may be seen as a useful form of social capital or competitive advantage, and may lead to higher career aspirations. Future research could further explore the whether beauty as currency belief and evaluation of self-attractiveness moderate the effects of self-objectification on women's career aspirations.

Conclusion

This study explored the association between self-objectification and career aspirations, as well as the underlying mechanisms in this relationship, among young Chinese women. The data obtained supported our hypotheses that Chinese female college students with higher self-objectification would be more likely to have lower career aspirations and that this relationship is mediated by self-esteem and career decision-making self-efficacy. These results help us to better understand the mechanisms through which self-objectification affects women's career aspirations.

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 the Ethics Committee of Henan University of Economics and Law. Written informed consent to participate in this study was provided by the participants' legal guardian/ next of kin.

Author contributions

QS carried out the experimental work and the data collection, interpretation, and wrote the manuscript.

Conflict of interest

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

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References

Adams, K. E., Tyler, J. M., Calogero, R. M., and Lee, J. (2017). Exploring the relationship between appearance-contingent self-worth and self-esteem: the roles of self-objectification and appearance anxiety. *Body Image* 23, 176–182. doi: 10.1016/j.bodyim.2017.10.004

Al-Bahrani, M., Abu Shindi, Y., Allawati, S., and Bakkar, B. (2021). A path analysis of effects of the career locus of control dimensions and career decision self-efficacy on career aspiration. *Int. J. Adolesc. Youth* 26, 367–375. doi: 10.1080/02673843.2021.1961831

Betz, N. E., and Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *J. Couns. Psychol.* 28, 399–410. doi: 10.1037/0022-0167.28.5.399

Betz, N. E., Klein, K. L., and Taylor, K. M. (1996). Evaluation of a short form of the career decision-making self-efficacy scale. *J. Career Assess.* 4, 47–57. doi: 10.1177/106907279600400103

Beyer, S. (2014). Why are women underrepresented in computer science? Gender differences in stereotypes, self-efficacy, values, and interests and predictors of future CS course-taking and grades. *Comput. Sci. Educ.* 24, 153–192. doi: 10.1080/08993408.2014.963363

Calogero, R. M. (2013). "On objects and actions: situating self-objectification in a system justification context" in *Objectification and dehumanization*. ed. S. J. Gervais (New York, NY: Springer), 97–126.

Calogero, R. M., and Tylka, T. L. (2014). Sanctioning resistance to sexual objectification: an integrative system justification perspective. *J. Soc. Issues* 70, 763–778. doi: 10.1111/josi.12090

Calogero, R. M., Tylka, T. L., Donnelly, L. C., McGetrick, A., and Leger, A. M. (2017). Trappings of femininity: a test of the "beauty as currency" hypothesis in shaping college women's gender activism. *Body Image* 21, 66–70. doi: 10.1016/j.bodyim.2017.02.008

Cao, Y. P., Yang, C., Wang, J., He, Q., and Tang, R. X. (2021). Self-objectification and importance of women's inner qualities: the mediating role of other-objectification. *Chin. J. Clin. Psychol.* 29, 850–853. doi: 10.16128/j.cnki.1005-3611.2021.04.038

Castro, S. M., and Armitage-Chan, E. (2016). Career aspiration in UK veterinary students: the influences of gender, self-esteem and year of study. *Vet. Rec.* 179:408. doi: 10.1136/vr.103812

Choma, B. L., Visser, B. A., Pozzebon, J. A., Bogaert, A. F., Busseri, M. A., and Sadava, S. W. (2010). Self-objectification, self-esteem, and gender: testing a moderated mediation model. *Sex Roles* 63, 645–656. doi: 10.1007/s11199-010-9829-8

Crompton, R., and Lyonette, C. (2011). Women's career success and work-life adaptations in the accountancy and medical professions in Britain. *Gend. Work Organ.* 18, 231–254. doi: 10.1111/j.1468-0432.2009.00511.x

Daniels, E. A., Zurbriggen, E. L., and Ward, L. M. (2020). Becoming an object: a review of self-objectification in girls. *Body Image* 33, 278–299. doi: 10.1016/j.bodyim.2020.02.016

Fang, P., Ma, Y., Zhu, W. L., and Jiang, Y. (2016). The status and issues of research on self-esteem. *Adv. Psychol. Sci.* 24, 1427–1434. doi: 10.3724/SP.J.1042.2016.01427

Fredrickson, B. L., and Roberts, T.-A. (1997). Objectification theory: toward understanding women's lived experiences and mental health risks. *Psychol. Women Q.* 21, 173–206. doi: 10.1111/j.1471-6402.1997.tb00108.x

Fredrickson, B. L., Roberts, T., Noll, S. M., Quinn, D. M., and Twenge, J. M. (1998). That swimsuit becomes you: sex differences in self-objectification, restrained eating, and math performance. *J. Pers. Soc. Psychol.* 75, 269–284. doi: 10.1037//0022-3514.75.1.269

Fritz, C., and van Knippenberg, D. (2017). Gender and leadership aspiration: interpersonal and collective elements of cooperative climate differentially influence women and men. *J. Appl. Soc. Psychol.* 47, 591–604. doi: 10.1111/jasp.12462

Gapinski, K. D., Brownell, K. D., and LaFrance, M. (2003). Body objectification and "fat talk": effects on emotion, motivation, and cognitive performance. *Sex Roles* 48, 377–388. doi: 10.1023/A:1023516209973

Garcia, R. L., Earnshaw, V. A., and Quinn, D. M. (2016). Objectification in action: self- and other-objectification in mixed-sex interpersonal interactions. *Psychol. Women Q.* 40, 213–228. doi: 10.1177/0361684315614966

Gray, M. P., and O'Brien, K. M. (2007). Advancing the assessment of women's career choices: the career aspiration scale. *J. Career Assess.* 15, 317–337. doi: 10.1177/1069072707301211

Gregor, M. A., Ganginis Del Pino, H. V., Gonzalez, A., Soto, S., and Dunn, M. G. (2020). Understanding the career aspirations of diverse community college students. *J. Career Assess.* 28, 202–218. doi: 10.1177/1069072719849872

Guo, Q., and Wu, M. (2021). The relationship between self-objectification and social avoidance among Chinese middle adolescent girls: the mediating role of appearance comparison and self-esteem. *Curr. Psychol.* 42, 3489–3497. doi: 10.1007/s12144-021-01705-8

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach*. New York: Guildford Press.

Huang, Q., Teng, F., and Yang, W. (2021). Awareness of societal emphasis on appearance decreases women's (but not men's) career aspiration: a serial mediation model. *Scand. J. Psychol.* 62, 564–573. doi: 10.1111/sjop.12740

Jackson, T., and Chen, H. (2015). Predictors of cosmetic surgery consideration among young Chinese women and men. *Sex Roles* 73, 214–230. doi: 10.1007/s11199-015-0514-9

Khampirat, B. (2020). The relationship between paternal education, self-esteem, resilience, future orientation, and career aspirations. *PLoS One* 15:e0243283. doi: 10.1371/journal.pone.0243283

Kuang, L., Zheng, W. W., Lin, C. D., Yang, M., and Liu, L. (2011). The relationship between college students' economic confidence and career decision-making self-efficacy—the moderating role of attribution and proactive personality. *Acta Psychol. Sin.* 43, 1063–1074. doi: 10.3724/SP.J.1041.2011.01063

Li, J., Xin, C. F., and Yu, G. L. (2016). A meta-analysis of career decision-making self-efficacy of college students. *Chin. J. Appl. Psychol.* 22, 48–57. doi: 10.3969/j.issn.1006-6020.2016.01.005

Loughnan, S., Baldissarri, C., Spaccatini, F., and Elder, L. (2017). Internalizing objectification: objectified individuals see themselves as less warm, competent, moral, and human. *Br. J. Soc. Psychol.* 56, 217–232. doi: 10.1111/bjso.12188

Luo, W. (2012). Selling cosmetic surgery and beauty ideals: the female body in the web sites of Chinese hospitals. *Women's Stud. Commun.* 35, 68–95. doi: 10.1080/07491409.2012.667055

McKinley, N. M., and Hyde, J. S. (1996). The objectified body consciousness scale: development and validation. *Psychol. Women Q.* 20, 181–215. doi: 10.1111/j.1471-6402.1996.tb00467.x

Moradi, B., and Huang, Y. (2008). Objectification theory and psychology of women: a decade of advances and future directions. *Psychol. Women Q.* 32, 377–398. doi: 10.1111/j.1471-6402.2008.00452.x

O'Brien, K. M., Friedman, S. M., Tipton, L. C., and Linn, S. G. (2000). Attachment, separation, and women's vocational development: a longitudinal analysis. *J. Couns. Psychol.* 47, 301–315. doi: 10.1037/0022-0167.47.3.301

Pas, B. R., Lagro-Janssen, A. L., Doorewaard, J. A., Eisinga, R. N., and Peters, C. P. (2008). Gender differences in career motivation: female doctors' ambitions benefit from family friendly work environment. *Ned. Tijdschr. Geneeskd.* 152, 2172–2176.

Rosenberg, M. (1965). *Society and adolescent self-image*. Princeton, NJ: Princeton University

Sherman, A. M., and Zurbriggen, E. L. (2014). "Boys can be anything": effect of Barbie play on girls' career cognitions. *Sex Roles* 70, 195–208. doi: 10.1007/s11199-014-0347-y

Slater, A., Halliwell, E., Jarman, H., and Gaskin, E. (2017). More than just child's play?: an experimental investigation of the impact of an appearance-focused internet game on body image and career aspirations of young girls. *J. Youth Adolesc.* 46, 2047–2059. doi: 10.1007/s10964-017-0659-7

Tang, W. Q., Xu, X. X., and Liu, Y. Y. (2019). The mediating effect of self-esteem on self-objectification and appearance anxiety of college students. *Chin. J. Health Psychol.* 27, 1105–1109. doi: 10.13342/j.cnki.cjhp.2019.07.035

Taveira, M. C. D. (1997). Exploration and career development in adolescence: Relation between exploration, identity, and indecision. *Doctoral Dissertation*. University of Minho.

Taylor, K. M., and Betz, N. E. (1983). Applications of self-efficacy theory to the understanding and treatment of career indecision. *J. Vocat. Behav.* 22, 63–81. doi: 10.1016/0001-8791(83)90006-4

Thompson, M. N., Her, P., Fetter, A. K., and Perez-Chavez, J. (2019). College student psychological distress: relationship to self-esteem and career decision self-efficacy beliefs. *Career Dev. Q.* 67, 282–297. doi: 10.1002/cdq.12199

Wang, P., Gao, H., Xu, J. Y., Huang, J. J., and Wang, C. J. (1998). The Rosenberg self-esteem scale: the development and validation in China. *Shangdong Arch. Psychiatry* 11, 31–32.

Wang, W., Zheng, X., Yue, X., and Zhong, N. (2020). The role of beauty as currency belief in acceptance of cosmetic surgery and career aspirations among Chinese young women. *J. Soc. Psychol.* 161, 351–362. doi: 10.1080/00224545.2020.1842314

Xu, B. B., Chen, X. Y., Wang, J. Y., and Li, J. J. (2021). Future time perspective and career decision making self-efficacy: chain mediating effect of perceived social support and self-esteem. *Psychol. Explor.* 41, 276–281.

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A time with e-Natureza (e-Nature): a model of nature-based health interventions as a complex adaptive system

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Discussions surrounding the positive impacts of nature on human health and strategies to enhance our connection with the natural world have been ongoing. However, a limited number of theoretical models are available to guide research and practice in this area. Therefore, there is a pressing need for a systematic framework that outlines clear steps for conducting research implementing nature-based interventions. In this study, we investigate the relationship between health and nature through the lens of Complex Adaptive Systems. This approach involves examining the dynamic interactions between multiple interconnected elements to understand the complex emergent behaviors that arise from such relationships. Our model is designed to support nature-based interventions, considering the essential interdependence between humans and nature. This perspective aims to improve both human health and biodiversity conservation in a mutually beneficial manner. The underlying interactions that drive nature-based health interventions are thoroughly explored, leading us to propose a novel intervention model named "A time with e-Natureza" (e-Nature). This model encompasses four types of experiences, drawing from scientific literature and insights from authors engaged in an interdisciplinary research group: (1) Aesthetic and emotional experience; (2) Multisensory integration experience; (3) Knowledge experience; and (4) Engagement experience. Each experience within the model targets affective, cognitive, and behavioral aspects, with a specific focus on fostering a deeper connection with nature. Distinct activities are incorporated within each experience to promote successful outcomes. The model is grounded in existing theories that address the human-nature relationship and is informed by Nursing theories that support health promotion interventions. By presenting this new model, our aim is to contribute to the effective implementation of nature-based interventions that not only enhance human well-being but also support the conservation of nature. This integrated approach recognizes the mutual benefits of human-nature interaction and offers valuable insights for future research and practical applications in the fields of nature and health.

KEYWORDS

nature-based interventions, health promotion, models, complex adaptative systems, forest bathing, nature relatedness, nature conservation

1. Introduction

The world has been undergoing rapid and threatening changes for humanity. Climate change lies at the heart of various current problems that are likely to increase in number and severity if the relationship between human beings does not return to positive levels of coexistence and interdependence that have permeated their existence on this planet (Pörtner et al., 2022).

The recent report of the Intergovernmental Panel on Climate Change (IPCC) have highlighted the unequivocal role of human activities in driving the process of climate change, leading to significant changes in atmospheric, oceanic, and terrestrial surface warming (Lee et al., 2023). This has significantly affected the foundations of human health and well-being (Romanello et al., 2022). Catastrophic floods and storms have forced over 20 million people to leave their homes each year. Forest fires are burning larger areas than ever before in many regions, and higher temperatures are also facilitating the spread of vector-borne diseases, increasing the likelihood of emerging and re-emerging infectious diseases. Climate change is affecting entire species, ecosystems, and the most vulnerable people (Lee et al., 2023).

Considering the imperative for humanity to pursue a more sustainable path, the United Nations (UN) launched the 2030 Agenda in 2015. This comprehensive action plan encompasses people, the planet, and prosperity, aiming to foster universal peace, heightened freedom, and collaborative partnerships, and guided by the triple bottom line of sustainable development: economic, social, and environmental factors (United Nations, 2015).

Since 2008, there has been a significant shift in global population distribution, with most people now residing in urban areas (United Nations, 2019). This urbanization trend has raised concerns about reduced contact with nature and subsequently weaker connections to the natural world (Soga and Gaston, 2016). While it is important to note that living in urban areas does not necessarily imply a weaker connection with nature, but the limited exposure to natural environments in cities increases the risk of it happening. Pyle (1993) described as the "extinction of experience," 30 years ago. This refers to the decline in opportunities for engaging with and accessing green and blue spaces within urban settings, leading to a diminished connection with nature.

Analyzing data from 14,745 adults in European countries, researchers found that the British have the lowest connection with nature, despite a high number of studies in the UK highlighting the implications for both people and biodiversity (Richardson et al., 2022).

Bearing in mind that what is good for humans is not always good for nature, urbanization has not only driven people away from natural areas but has also affected biological communities (Dornelas et al., 2014) and reduced biodiversity in various habitats (Dirzo et al., 2014), creating an imbalance that can affect human health. A meta-analysis of 61 experimental and observational studies found a strong overall negative correlation between biodiversity and disease risk (Civitello et al., 2015).

In addition, since the post-World War II era, technological change and the emergence of indoor and virtual recreational options have played a role in distancing people from natural environments. Examples of these recreational options include television in the 1950s, videogames in the 1970s, and the advent of the internet, mobile computers, and smartphones from the 2000s onwards. Some data also demonstrate that nature is significantly less present in popular culture today than in the first half of the 20th century, with a steady decline after the 1950s as well (Kesebir and Kesebir, 2017). Technology potentially reduces our connection to nature, at a cost to the well-being of people and the environment that sustains us, and there is growing concern about the potential for smartphone addiction. However, a greater connection with nature can provide a respite from smartphone use, yet it should not simply be framed as an antidote (Richardson et al., 2018).

Considering this context, scientists around the world have been discussing this issue in search of ways to improve human connection with nature, as well as guiding models of thought, action, and behavior towards a more positive human-nature relationship (Lumber et al., 2017; Richardson and Butler, 2022).

Indeed, over the past 50 years, scientists have proposed four different conservation strategies (Mace, 2014): "Nature for itself," in which conservation actions protect nature; "Nature despite people," in which conservation actions restore degraded environments; "Nature for people," which focuses on the importance of nature for human well-being, health, and the economy (as an ecosystem service); and "People and nature." It is argued that focusing on the dual relationship, which is beneficial for both, can result in human-nature in a two-way path that can improve sustainability, but has been neglected in health and conservation policies (Barragan-Jason et al., 2023). One reason for this may be related to the lack of dialogue between these two areas of knowledge in effective collaborative projects. Additionally, there are still difficulties in systematizing strategies from the perspective of "People and Nature."

With this in mind, in 2020, our interdisciplinary research group at the Hospital Israelita Albert Einstein in Brazil, focused on nature connection, health, and well-being, launched a series of initiatives. These included communication and awareness-raising strategies targeting the general population, educational programs designed for health and natural sciences professionals, programs for students, and a project called "Um tempo com e-Natureza" ("A time with e-Nature") aimed at evaluating the impact of nature-based interventions on health and well-being.

The complexity theory that we adopt as a backdrop for supporting complex adaptive systems seeks to explain the complex behavior that emerges from the non-linear dynamics of systems (Chaffee and McNeill, 2007). A system is comprised of interconnected components, but simply having these components does not make it "complex." A complex system exhibits dynamic behavior, with its actions and

patterns evolving over time. These emergent behavioral patterns arise from the interactions among the system's components within a larger whole, and cannot be reduced to the functions of individual elements within the system. Complex systems cannot be completely understood, controlled, or predicted (Meadows, 2008).

Evaluation of public health interventions from complex systems has been carried out and still lacks methodological development (McGill et al., 2021). On the other hand, natural ecosystems are complex adaptive systems that exhibit multiple alternative states and can be changed mainly in the face of the current climate crisis (Solé and Levin, 2022). Both nature and health are complex systems composed of interconnected elements. These systems exhibit dynamic and nonlinear interactions among their components, influencing each other. Understanding this complexity helps develop more effective approaches to promoting human health and nature conservation.

Considering these two systems, some aspects have been emphasized in the literature that contribute to the beneficial effects of nature for human health and well-being: the aesthetic appreciation and the apprehension of nature through the senses. Other aspects relate more directly to conservation. Integrating these experiences can be useful in a multi-component model. In view of this, the proposed model is based on four pillars: (1) Aesthetic and emotional experience; (2) Multisensory integration experience; (3) Knowledge experience; and (4) Engagement experience.

We understand that these pillars, when integrated with equal importance attributed to each, can meet the needs and benefit both humans and nature alike. The rationale for the development and the foundation of each pillar are presented in this article.

1.1. Health and conservation of biodiversity: a two-way road

Complex Adaptive Systems (CAS) are systems composed of multiple interconnected elements that exhibit complex emergent behaviors resulting from dynamic interactions among their components. These systems are characterized by their ability to adapt and evolve in response to changes in the environment or internal conditions. Any system can be understood as an intricate network of relationships and interactions, where the whole is more than the mere sum of its parts. Any change in any part, even in a single element, can generate reactions and modifications in the interconnected elements and in the surrounding environment. Therefore, the system is a dynamic organism that constantly adapts to internal and external changes. However, by making many small-scale changes and selecting those that produce the desired effects, individuals and groups can bring about improvements to the system (Morin, 2010). Health has been considered a CAS. The Meikirch Model of Health advocates that: "*Health is a state of well-being emerging from favorable interactions between individuals' potentials, life demands and social and environmental determinants*" (Bircher and Kuruvilla, 2014).

Nature is often seen as a CAS because it is composed of multiple interconnected elements that adapt and evolve in response to changes in the environment. Biodiversity is an example of an emergent property of a CAS in nature. Biodiversity results from the dynamic interaction between different species, and changes in one species can have significant effects on other species and the ecosystem as a whole (Levin, 1998). It's important to note that although humans are part of this complex system, they are also agents. The elements (or agents) that make up complex adaptive systems are independent but interconnected to other agents. As agents, their reactions, often unpredictable and underestimated, influence the entire system since interconnection is present (Plsek and Greenhalgh, 2001). Thus, both health and biodiversity are evolving and need to be considered in interventions that seek to articulate these two universes.

Complex adaptive systems is an approach adopted as the background of our rational model. Our rationale is that different types of experiences and related activities integrated, considering two complex universes, add to this double objective that can be considered a single one if we consider the concept of One Health of the World Health Organization: "*is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent*" (Adisasmito et al., 2022).

1.2. Nature connection – concept

The concept of connection with nature has been interpreted in various ways. Schultz defined it as "the extent to which an individual includes nature within his/her cognitive representation of self." Its construction consists of three components: (1) Cognitive – the core of nature connection and refers to how someone feels integrated with nature; (2) Affective – the individual's sense of care for nature; and (3) Behavioral – the individual's commitment to protecting the natural environment (Schultz, 2002).

On the other hand, Mayer and Frantz (2004) approached connectedness from a different perspective, defining it as an individual's affective and experiential connection to the natural world, rather than a cognitive one. Other researchers (Perrin and Benassi, 2009) proposed that connectedness with nature encompasses an individual's beliefs and attitudes about their connection to nature, extending beyond mere affective connection.

From these concepts Geng et al. (2015) presented the concept of connection with nature, to bring together all these aspects as "the feelings of an individual not only emotionally, but also cognitively in relation to connections with nature and belonging ". It presupposes in addition to an affective sense of identity with nature, pro-environmental attitudes and behavior, that is also indicated in a meta-analysis study (Mackay and Schmitt, 2019). This is a proposal that resonates with our model, as we have listed important characteristics that we seek to include in the levels of experience and activities to be developed. They are: the feeling of belonging; awe and reverence for the beauty, complexity, and diversity of nature; appreciation and respect; understanding and knowledge (a cognitive understanding of ecological processes, species diversity and conservation issues); and environmental awareness. Although the literature presents varied results regarding the magnitude and different levels of connection between people and nature, mediated by cultural, political, social, age, and other factors, the aspects that determine these variations remain unknown (Soga and Gaston, 2023). This knowledge gap is particularly evident in the Southern Hemisphere, where climatic and natural characteristics differ from those of the Northern Hemisphere, posing challenges in establishing parameters to prevent and reverse the disconnection from nature.

Despite the increasing number of studies on the benefits of contact with nature on health (Frumkin et al., 2017), it is important to emphasize that contact with nature differs from connection with nature.

Contact with nature refers to the interaction between an individual and any element of the natural world or being in the presence of a natural environment (Garza-Terán et al., 2022). Human contact with nature can be classified as: (1) Indirect: involving contemplation of a photograph, a painting or even a real scene through a window, for example. Physical presence is not necessary; (2) Incidental: there is physical presence, but contact happens unintentionally, such as having a plant in a room; (3) Intentional: there is physical presence and the intention of contact with nature, such as choosing to hike or walk in a park (Keniger et al., 2013).

Therefore, our model is based on connection with nature, which has been shown to be more relevant to health and well-being than just contact with nature (Martin et al., 2020). It is more important to be with nature than just in nature.

A critical analysis of activities aimed at improving connection with nature suggests that activities based solely on knowledge, simple contact with green spaces such as parks, or a patio with vegetation, do not always lead to short-term improvements in nature connectivity (passive contact). There is evidence that active engagement with nature depends on the activity performed, as traditional outdoor adventure programs have not led to increased connection with nature, likely because the focus is on the challenge or adventure in nature, rather than a deeper relationship with nature itself (Richardson et al., 2020).

Indeed, studies have shown that activities that involve emotional attachment, meaningful experiences, and a compassionate relationship with nature are essential for increasing connection with nature (Lumber et al., 2017; Barragan-Jason et al., 2023). These types of activities may include things like gardening, nature walks, bird watching, and other activities that involve a deeper and more personal engagement with the natural world. Such activities can help individuals develop a greater sense of awe, wonder, and reverence for the natural world, leading to a more profound and meaningful connection with nature.

It is considered contact the act of engaging with nature through the senses for pleasure, for example: listening to bird songs, smelling wildflowers, watching the sunset. Beauty presupposes involvement with the aesthetic qualities of nature, such as appreciation of natural landscapes or artistic expression of nature. On the other hand, meaning implies using nature or its symbolism (e.g., language and metaphors) to represent an idea, thinking about the meaning of nature and its signs (Lumber et al., 2017; Pocock et al., 2023).

Emotion is represented by the emotional bond and love for nature, such as talking and reflecting on one's feelings about it, which can contribute to its conservation. Lastly, Compassion seeks to extend the self to include nature, leading to a moral and ethical concern for nature, for example: making ethical choices of products, caring for plants and animal welfare (Lumber et al., 2017; Choque, 2021; Prato-Previde et al., 2022).

Additionally, it is important to emphasize that the pathway that operates in this dimension deserves to be explored not only during activities in nature, but permeating individuals' lives even when they are not in a natural environment, like small doses, so that the experience lived in nature is not forgotten amidst the daily urban chaos for a significant portion of the population. However, promoting such integration is complex and challenging.

It is also worth noting that, beyond predictors of connection with nature, paths of connection, and recommended activities, two other aspects may be extremely relevant and have been little addressed or integrated in the literature. The first concerns natural characteristics that may affect the connection with nature differently when considering Kellert's values (Kellert, 1993), such as fear that may accompany certain natural environments due to factual or imaginary risks. The second aspect is the diversity of nature-based health interventions that are labeled as forest bathing but, in fact, are not completely described, discussed or adapted for different contexts.

We have been reflecting a lot on forest bathing, a practice widely described in the literature that has also become popular in non-scientific circles. It is an activity originating from Japan that consists of experiencing the atmosphere of nature through the senses, associated or not with other integrative techniques such as meditation, Yoga, etc. (Li, 2019). Unlike Japan where it is mainly done in temperate forests or in Europe in coniferous forests, Brazil has a greater diversity of biomes, whether forest (Amazon rainforest or Atlantic Forest), cerrado, pampa, coastal strip, among others, that offer an experience that can vary due to the landscapes and faunistic and floristic biodiversity that compose them. Different aspects of the natural environment deserve future investigations and their relationship with the connection with nature. In countries with these characteristics, even though inspired by Japanese forest bathing, it might be more appropriate to use the term "nature bathing."

On the other hand, the research protocols for nature-based health interventions are not well-defined in the literature, and there are few training programs available for conducting such interventions. These programs vary in terms of duration, theoretical framework, and program content. This highlights the need for creativity in designing intervention protocols, which should be aligned with the theoretical assumptions of interdisciplinary teams, their existing or developing skills and competencies, and be compatible with the reality in which they will be implemented.

2. The nature-based intervention model "A time with e-Natureza (e-Nature)"

This model arises from the perspective that health and nature are complex adaptive systems and is rooted in scientific literature, as well as the training and experience of researchers engaged in field activities within nature. These activities encompass various domains such as birdwatching, environmental education, nature photography and wildlife observation, appreciative gaze, and other techniques for contemplation of the natural world. Furthermore, despite the existence of theories that seek to explain the relationship between human beings and nature, this knowledge scattered in the literature needed to be articulated in a new perspective not only to benefit humans but also non-humans in the development of nature-based health interventions.

In this study, we have adopted the term "A time with e-Natureza (e-Nature)" for the model, as it derives from our "e-Natureza" interdisciplinary research group and directly reflects the core idea of spending time with nature. This term encapsulates the key concept we seek to explore. The proposed model addresses the various ways

people engage with nature, encompassing both individual and autonomous activities, as well as collective and guided interventions that aim to enhance the connection with nature. Our investigation encompasses a wide range of research in this area to provide a comprehensive understanding of the subject.

The intervention model "A time with e-Natureza (e-Nature)" consists of a set of activities congruent with four pillars of support: (1) Aesthetic and emotional experience, (2) Multisensory integration experience, (3) Knowledge experience, and (4) Engagement experience, it represents a fundamental component of a nature-based intervention aimed at human health and well-being and nature conservation. It also draws significant inspiration from the Japanese practice of forest bathing, particularly in the activities outlined in pillars 1 and 2. However, two additional levels of experience have been integrated, recognizing their essential role in fostering not only human well-being but also biodiversity conservation. Considering the dynamic interaction among the elements involved in the intervention, including people, plants, animals, the natural environment, and the local culture, this model can be recognized as a Complex Adaptive System (CAS). Furthermore, this nature-based health intervention can involve multiple interactions and feedback loops among the elements, and these interactions can change over time in response to different stimuli and events. For instance, the natural environments where the intervention is carried out may be affected over time by factors such as climate change, resource availability and community demand. Additionally, any nature-based intervention may also have an impact on the natural environment, even if efforts are made to mitigate any potential harm.

Understanding this intervention (like any other that is proposed to be carried out in natural environments) as a CAS can help identify and anticipate potential impacts and improve its long-term effectiveness and sustainability. Figure 1 represents our model. As illustrated in the Figure, the model presents two expected outcomes for a nature-based intervention: improved health and well-being, and biodiversity conservation. The four types of experiences that make up the model are described in the subsequent circle. These experiences are: Aesthetic and emotional experience, Multisensory integration experience, Knowledge experience, and Engagement experience. The dark green circular arrow indicates the starting point of the model (Aesthetic and emotional experience) and the following arrows indicate the feedback loop that is created as the experiences interact with each other. The outer circle represents the connection with nature, which is developed through the integration of the four experiences. The Figure also depicts the three pillars of the connection with nature: the affective component, the cognitive component, and the behavioral component. The affective component is linked to the Aesthetic and emotional experience and Multisensory integration experience. The cognitive component is linked to the Knowledge experience. The behavioral component is linked to the Engagement experience.

2.1. The aesthetic and emotional experience – beauty/emotions/feelings

An aesthetic experience is a perceptual experience focused on the beauty of an object such as a work of art or an aspect of nature, but it is also possible to experience it not through perception, but through an emotional experience configured in sensations of pleasure with a positive hedonic tone (Peacocke, 2023). Aesthetic perception involves emotions and feelings. Emotions accompany and inform our experiences of art, literature, music, nature, or attractive visions, sounds, and lines of thought in general. Emotions such as being touched by something, beauty, fascination, captivation, reverence, transcendence, enchantment, and admiration (and also inspiration) are indicated in the literature as a state of appreciation that reveals dimensions of aesthetic appeal (Schindler et al., 2017). Visual stimuli of natural elements (not only landscapes) trigger different aesthetic reactions and levels of relaxation. Images of the sea, colorful birds, and pale birds have high valence, while images of flowers and the sky tend to be more relaxing (Dal Fabbro et al., 2021).

In the proposed model, this is of particular importance, as birdwatching during a nature-based health intervention has been one of the key tools to arouse interest, attention, but above all, to cause enchantment, generate empathy, and provide knowledge about nature, either literal or metaphorical. It is important to note that although didactically separated, the elements that make up the experiences are interchangeable.

Aesthetic experiences present different qualities: (a) they can reflect on the aesthetic value of an entity (i.e., resulting from engaging in aesthetic contemplation); (b) they can come to a decision about it (i.e., making an aesthetic judgment); or (c) they can involuntarily shift our attention to the aesthetic processing of a stimulus (i.e., experience of aesthetic distraction). However, some researchers have pointed out that there are experiences that operate in an "aesthetic mode," which involves a disinterested interest, focusing attention on the stimulus, integrating context, memory, and sensory qualities, and neglecting self-referential concerns or perceptions of everyday life (Weigand and Jacobsen, 2021).

This aesthetic mode is related to Kaplan and Kaplan's Attention Restoration Theory (Kaplan, 1995). This theory suggests that individuals require constant effort to avoid losing their focus on something more interesting. However, this daily effort to maintain concentration eventually leads to fatigue, which triggers a series of stress-related symptoms (Wang and Zhao, 2020). This theory is composed of four elements: fascination, being away, extent, and compatibility. Fascination is directly related to the aesthetic experience, as it presupposes the entry into esthetically pleasing stimuli that allow for the opportunity for reflection, promoting more efficient attention restoration (Kaplan, 1995). Researchers have shown that the more mentally fatigued a person is, the more likely he or she would choose a restorative walk in a natural environment over an urban. Study on preferences for four of the restorative components of natural environments proposed by Attention Restoration Theory found that these qualities are highly correlated with the aspects of an environment that independently make it a "favorite place" for individuals (Korpela et al., 2001). Indeed, a place that evokes pleasant sensations contributes to the creation of a sense of identity and connection, which, in turn, also results in restorative effects (Ratcliffe and Korpela, 2016). Exposure to the beauty of nature can increase the frequency and intensity of aesthetic experiences, which contributes to improved emotional abilities and greater life satisfaction by activating the brain's reward system (dopaminergic activity – dopamine is a neurotransmitter responsible for relaying information to various parts of the body and when released, it triggers feelings of pleasure and increases motivation).

Aesthetic experiences are immediate, experiences of physically and visually (or multisensorially) pleasant environments that can help reduce stress, as they trigger positive emotions, maintain a

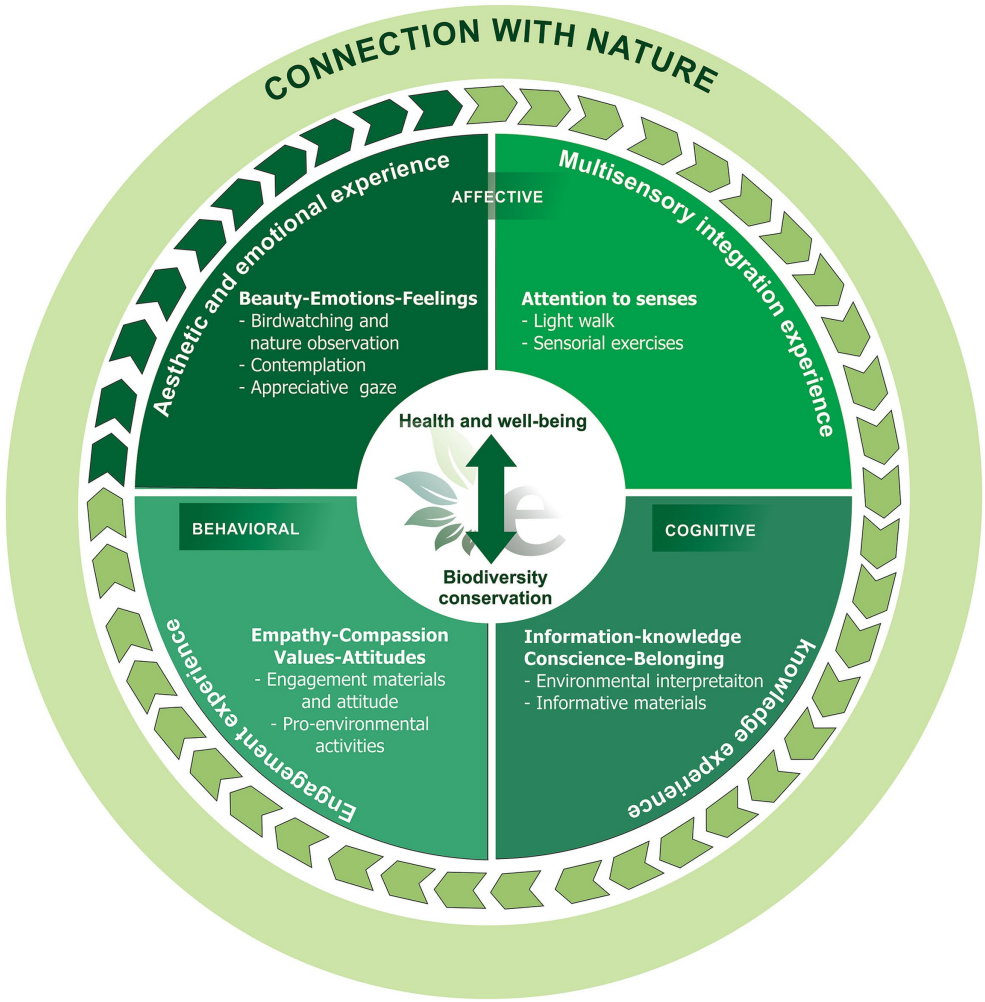

FIGURE 1
Diagram representing "A time with e-Natureza (e-Nature)."

non-vigilant state of attention, decrease negative thoughts, and allow for the return of physiological arousal to more moderate levels, as advocated by the Psychophysiological Recovery Theory to Stress (Ulrich, 1983).

Despite the fascination element being the one most directly related to the aesthetic experience, the other components of this theory (Kaplan and Kaplan, 1989) create the necessary conditions for this aesthetic experience to occur more easily. By moving away from everyday life (being away), being in contact with nature, feeling affinity with the natural environment (compatibility) and perhaps experiencing the feeling of belonging to something much greater (extent), it gives greater quality to the aesthetic experience, as well as increases the possibility of encountering various elements that provide the fascination, emotions and feelings associated.

2.1.1. Proposed activities for the aesthetic and emotional experience

Engaging in various activities in nature can lead to aesthetic-emotional experiences. These experiences arise when individuals are captivated by the beauty, tranquility, and awe-inspiring elements of the natural environment.

2.1.1.1. Birdwatching and nature observation

Birdwatching, also known as birding, is the activity of identifying and observing birds in their natural habitat. It can be carried out by anyone and can be done virtually anywhere in the world, from the densest forest to urban parks, and has been found to be effective in providing enchantment to observers. Thus, birdwatching can be combined with other outdoor activities such as hiking, camping, and nature photography, and in this study, it is considered an essential activity for intervention. Moreover, it is also recognized as a conservation tool, contributing to the monitoring of biodiversity and the protection of birds and their habitats.

In a study involving 26 European countries, the authors established a relationship between the diversity of bird species in a region and the self-evaluation of life satisfaction by residents of those regions (Stobbe et al., 2022). It was observed that a 10% increase in bird species diversity increases life satisfaction approximately 1.53 times more than a proportional increase in income (Methorst et al., 2021). If this occurs considering the regular presence of 540 species in Europe, differences in the experience can be expected in a natural environment such as Brazil, where 1,825 species occur, according to the Brazilian Committee of Ornithological Records, or in Colombia,

the world record holder in bird species with 1,924 identified species, with its richness of sounds and colors.

In an online randomized experiment, 295 participants were exposed to different sounds for 6 min: low traffic noise, high traffic noise, low bird song, and high diversity bird song soundscapes. The results showed that the soundscapes of traffic noise were related to a significant increase in depression. Regarding bird song, depression decreased exclusively after exposure to the high diversity bird song soundscape (small effect size). In addition, both anxiety and paranoia decreased significantly in both bird song conditions (medium effect size). Therefore, the results suggest that listening to bird songs, regardless of diversity, improves anxiety, while traffic noise is related to greater depression (Ratcliffe et al., 2013).

2.1.1.2. Contemplation and appreciative gaze

Nature contemplation is the practice of appreciating and observing the natural world, often in search of a deeper and more meaningful connection with the environment around us. This can involve observing landscapes, animals, plants, water and sky, or simply sitting quietly and paying attention to what is around us. Nature contemplation has been valued by many cultures throughout history as a way to promote inner peace, relieve stress, inspire creativity and reflection, and even improve mental and physical health.

Some scholars believe that contemplation of nature can be an important practice to help people reconnect with the environment and develop a sense of responsibility and care for the planet. Rachel Carson, a writer, and marine biologist who is famous for her book "Silent Spring," which warned about the negative effects of pesticides on the environment, believed that contemplation of nature was essential to understanding the interconnectedness of all living beings and to developing an environmental ethic. Contemplative attention to the natural world is not only a spiritually significant act in itself, but can also generate ethical actions (Eggemeier, 2014).

The prevalence of colors such as green, brown, and blue in any forest environment, along with the contemplation of fractal patterns and shapes (such as branching trees, bushes, rivers), can convey specific visual stimuli to the central nervous system that humans have a habit of perceiving as "familiar" since ancient times (Antonelli et al., 2021). Additionally, the act of contemplation is often associated with aesthetic judgment (Di Dio et al., 2016).

Another possibility is engaging in nighttime activities, such as stargazing. A study demonstrated the concept of "Dark Nature," which encompasses both the nocturnal environment and the nature-interaction activities available in it. The results indicated that participants with more years of stargazing experience and those who reported noticing wildlife during stargazing had higher levels of nature connectedness. The responses from participants suggest that stargazing can be considered a Dark Nature activity, as it involves interacting with the nocturnal environment, rather than simply taking place in the dark, and may offer similar benefits to those experienced by individuals participating in daytime activities in natural environments (Bell et al., 2014).

On the other hand, stargazing is an activity that can help mitigate the detrimental effects of light pollution, such as disruptions to biological rhythms and overall behavior of animals and plants, significant economic and energy losses (Mizon, 2002). The loss of dark skies influences not only our perception of the nighttime environment and physical health but also our overall well-being (Bjelajac et al., 2021).

2.2. The multisensory integration experience – attention to senses

Multisensory integration is the brain's ability to combine sensory information from different sensory channels, such as vision, hearing, touch, smell, and taste, to form a more complete and accurate perception of the environment. In other words, it is the capacity to integrate sensory information from multiple sources to form a more complete and more accurate picture of the world. Multisensory integration not only exerts bottom-up control, but also top-down control over attention. This ability is essential for many cognitive tasks, such as object recognition, spatial orientation, decision-making, and social interaction. In the intervention "A time with e-Natureza (e-Nature), multisensory integration arises both from endogenous attention, also called voluntary or goal-directed attention, when the facilitator conducting the activity draws attention to some element of the natural world, such as a flower or bird observed nearby, involving a more purposeful and effort-intensive process of orientation (Macaluso and Maravita, 2010). But it also makes use of exogenous attention, also called involuntary or stimulus-driven attention, which can be reflexively triggered by a salient sensory event in the external world (Hopfinger and West, 2006), such as the participant having their attention drawn to a bird landing on a tree, even if the facilitator did not draw attention to it.

Integrated multisensory events can efficiently capture attention even in complex circumstances, due to their greater relevance compared to unimodal events, and therefore can enhance the experience. Moreover, within a multisensory experience, endogenous attention can spread from one modality to another in an exogenous manner.

2.2.1. Proposed activities for the multisensory integration experience

Proposed activities for the multisensory integration experience aim to engage multiple senses and enhance our connection with nature. These activities involve immersing ourselves in the sights, sounds, smells, textures, and even tastes of the natural environment.

2.2.1.1. Light walk

Engaging in physical activity is often associated with physical and mental health, and exercise performed in natural environments has been considered more effective and enjoyable. Researchers have demonstrated that a gentle 10-min walk covering approximately 400 meters in a natural environment is sufficient to influence cognitive test outcomes (Bailey and Kang, 2022). In this context, connection with nature leads individuals to experience more mindfulness during the outdoor intervention, as well as reducing rumination as evidenced by a lower frontal beta wave during the experience. This reinforces the Attention Restoration Theory and the effectiveness of short outdoor interventions incorporating physical activity as a method of restoring mental attention (Bratman et al., 2015).

Regular physical activity contributes to the primary and secondary prevention of various chronic diseases and is associated with a reduced risk of premature death (Warburton et al., 2006). The proposed model

includes a short and light walk to emphasize the relationship with the natural environment, but it is still a fact that exercise is present and can be intensified if the participant perceives benefits to their health, making it a regular practice (Lahart et al., 2019). A study with almost 30,000 participants demonstrated that promoting any type of walking can be a way to help adults avoid inactivity and encourage an active lifestyle for the prevention and treatment of cardiovascular diseases (Omura et al., 2019).

2.2.1.2. Sensorial exercises and appreciative gaze

The appreciative gaze is understood as a mindfulness practice in which, through an integrated multisensory approach, the individual consciously connects with elements of their own reality, resulting in a sense of well-being (Isanta, 2018). The practice of the appreciative gaze involves the integration of all senses in the search and recognition of elements available in the present moment that can be a source of appreciation, satisfaction or enchantment when rescued from their pseudo-invisibility, a state in which they would remain if not consciously perceived and valued (Fingerhut and Prinz, 2018).

It is a trainable and reproducible mental attitude (Kolb and Whishaw, 1998). With regular repetition of small appreciative gaze practices distributed throughout the day, elements in the environment can be found and processed as sources of enchantment. The awakening of enchantment, in turn, has the potential to trigger the endogenous release of substances responsible for the feeling of well-being (Creswell, 2017).

The perception of reality results from subjective and intransferable filters, involving genetic, sociocultural, environmental, and emotional components, among others. However, the appreciative gaze, with its sensorial exercises, generates a personal satisfaction response that transcends differences and contributes to the feeling of well-being (Lyubomirsky et al., 2005; Seligman, 2011), potentially representing an accessible tool for stress management (Menardo et al., 2022).

2.3. Knowledge experience

A knowledge-based experience in nature is one in which a person gains access to a range of information about the natural world. During this experience, participants can observe, explore, and learn about different aspects of nature, including biodiversity, ecosystems, natural processes, and the challenges faced in environmental conservation. The aim of a knowledge-based experience in nature is to deepen understanding and connection with the natural world, fostering a sense of appreciation, awe, and responsibility towards the conservation and preservation of nature.

2.3.1. Information/knowledge

When discussing knowledge, it extends beyond merely providing information about the natural environment where nature-based interventions occur. Knowledge also relates to Aesthetic experience. It is important to keep in mind the "stop for knowledge" hypothesis, which refers to learning something new. Aesthetic experiences cannot be reduced to a mere decorative aspect of life; they must be considered a fundamental part of our knowledge acquisition process. This requires working memory resources, and research evidence and neuroimaging show that beauty is associated with motor inhibition as well as increased attentional focus on sensory stimulation. This concentration of processing resources on the object of aesthetic appreciation is crucial for learning. The presence of aesthetic experiences keeps observers focused on the constantly changing present moment and intensifies the sensations and emotions provoked by the beauty of what is being observed. This allows observers to direct their attention to the perceptual activity, i.e., the experience of knowledge, which is also related to the multisensory integrated experience, resulting in sensory amplification. There is evidence suggesting a connection between aesthetics, pleasure, and perceptual learning, which aims to update the predictive mental environment (Sarasso et al., 2020).

The process of adaptation is crucial for optimal learning, enabling better interaction with the external world and modulation of our behavior. In simple terms, the beauty of nature arouses in us a curiosity for novelty, as even though it is made up of recognizable patterns, it never repeats itself. Depending on the time of day, the lighting, and other factors, nature constantly presents itself to our perception as renewed (Sarasso et al., 2020).

Activities related to education and environmental interpretation as a way of enhancing aesthetic experiences can provide knowledge that leads to behaviors more connected with nature. This knowledge is fundamental for Engagement experience to be effective. It is important to highlight that lifelong education is built upon four fundamental pillars: learning to know, learning to do, learning to live together, and learning to be. These pillars enable us to embrace the wisdom shared by African conservationist Baba Dioum, who emphasized that ultimately, we will preserve only what we love, love only what we understand, and understand only what we are taught.

2.3.2. Conscience and belonging

The sense of belonging brought to consciousness can also be achieved by promoting connection with nature and consequent pro-environmental behaviors (Stern, 2002). According to a meta-analysis, there is a strong association between connection with nature and pro-environmental behaviors, such that the more an individual feels connected and part of nature, the more they promote conservation actions. A brief artificial exposure to elements of nature, using images and videos, may not be strong enough to enable such a sense of unity and connection (Mackay and Schmitt, 2019).

The sense of belonging can be extrapolated to other forms of connection. Connection with humanity, understood as the link with people outside of family and friend's groups, and the transformation of this bond into a sense of familiarity with other inhabitants of the world, generates the concept of global belonging, altruistic and conservationist attitudes (Buchan et al., 2011; Der-Karabetian et al., 2014). However, making this sense of belonging conscious seems to be a current challenge. One of the factors is the constant reduction in the time children spend outdoors and exposed to nature, to the detriment of more screen time (Kellert et al., 2017), which can lead to the phenomenon called "Nature Deficit Disorder" by Louv (2008).

As a strategy to change this scenario of children's relationship with nature, Social Emotional Learning (SEL) of children has been valued. SEL is defined by the Collaborative for Academic, Social, and Emotional Learning (CASEL) as the process that enables the acquisition and application of competencies directed towards social awareness and interpersonal relationships (Collaborative for Academic, Social, and Emotional Learning, 2022). Recently, a relationship has been demonstrated between nature connection and

such competencies, such that the development of nature-based SEL interventions can facilitate and strengthen children's psychological connection with nature (Lanza et al., 2023).

The role of belongingness and awareness in this model's Knowledge Experience is therefore to drive connection and provide experiences with content and natural environments, breaking a cycle of lack of knowledge – reduced experiences in natural environments – negative emotions and behaviors directed towards nature (Soga and Gaston, 2016).

Hence, the creation of spaces and activities, such as the one presented here, becomes crucial in fostering a deeper connection between individuals and nature. These endeavors aim not only to offer insights into the health and well-being benefits supported by scientific literature but also to provide information and knowledge about the natural world. By doing so, they contribute to strengthening environmental awareness and nurturing a sense of belonging. It is our belief that these efforts will foster shifts in attitudes and transformative changes that hold significance in the lives of every individual involved, ultimately enhancing the well-being of all, and promoting planetary health. Studies show that the sense of kinship, egalitarianism, incorporation, and belonging associated with a strong connection with nature promotes high levels of well-being (Mayer and Frantz, 2004). In addition, the innate emotional affinity that humans have for nature and other forms of life, such as pets, often translates into positive emotions when they are in the natural environment (Nisbet et al., 2011; Zelenski and Nisbet, 2014). Other authors (Mayer et al., 2009) argue that experiential feelings of belonging to nature facilitate people's ability to have purpose and meaning in their lives. In other words, the connection with nature can be a key factor that favors positive psychological functioning, as pointed out in an excellent current meta-analysis that investigated the relationship between nature connection and eudaimonic well-being (Pritchard et al., 2020).

2.3.3. Proposed activities for knowledge experience

Engaging in knowledge experiences in nature involves actively seeking and acquiring knowledge about the natural world. By immersing ourselves in these knowledge-based activities, we can deepen our understanding of the natural world, appreciate its complexity, and develop a stronger sense of connection and appreciation for the environment. These experiences not only expand our knowledge but also foster a deeper sense of wonder and respect for the intricate web of life that surrounds us.

2.3.3.1. Environmental interpretation

Environmental interpretation is the practice of communicating information about the natural and cultural environment of a specific area to the general public, with the aim of increasing awareness, understanding, and appreciation of the environment and its importance to society. It can be considered an important tool for environmental education (Ham, 1992). Environmental interpretation usually involves presenting information about the ecology, history, geology, culture, and other aspects of the natural and cultural environment, using a variety of methods including interpretive trails, informative signs, etc. Based on Tilden's principles, environmental interpretation should be enjoyable, meaningful, organized, thought-provoking, distinctive, and thematic (Tilden, 2009).

The goal is to engage and inspire the public to become more involved and responsible for the conservation of the environment. The proposed intervention adheres to the methodological recommendation of Environmental Interpretation, which advocates for a prior preparation in the field regarding the physical and discursive environment to be explored, with the goal of making it an event capable of capturing the individual's attention and reflection during the visit. This is necessary because the degree of influence of Environmental Interpretation depends on how the messages are formulated and presented to the audience. Increasing the degree of attention on the environment, favors of the state of presence, which fosters an appreciative gaze and pro-environmental behavior by strengthening the sense of belonging (Ham, 2007).

2.3.3.2. Informative materials

In addition to the knowledge shared during the execution of the intervention, structured materials can offer qualified information that helps in the expansion of this knowledge by the participants, as well as can help in the engagement after carrying out the nature-based intervention, contributing to an active experience.

2.4. Engagement experience

An experience for engaging with nature is one in which a person actively participates in physical, sensory, and intellectual activities that involve direct or even indirect interaction with the natural environment. By actively engaging with nature, individuals can develop a greater appreciation for biodiversity, understand ecosystems, and become active advocates for environmental conservation. To achieve this, it is essential to reflect on the intrinsic value of nature, beyond the ecosystem services it provides.

2.4.1. Empathy/compassion/values/attitudes

Engagement experience is based on the relationship between beings permeated by empathy, compassion, and values. Empathy is a concept that has been widely explored but without absolute consensus. In this model, empathy is conceptualized as comprising three pillars: (1) affective, wherein individuals can experience and understand the emotions and perceptions of others; (2) cognitive, involving the comprehension of another person's situation; and (3) behavioral, encompassing the expression of one's understanding and perceptions to assist and support others (Eklund and Meranius, 2021).

In this perspective, empathy extends beyond mere perspective-taking and involves a comprehensive understanding of another person's situation. It also emphasizes the importance of communicating this understanding to the individual, thus creating awareness, and subsequently, motivating helpful actions. In other words, empathy is a step that precedes compassion. Not by coincidence, the same three pillars compose the Connection with Nature. It is possible to intersect them to apply the concept of empathy not only to human beings, but to all living beings and nature itself.

In the US, there is already research on criteria for green areas to evoke empathy in their visitors. One of the American examples that stands out is the Hillside Environmental Education Park (HEEP), located on University of Connecticut (165 acres of conservation area located on the North Campus of UConn). HEEP is publicly owned and focuses on nature; is one of the few designs in the United States

that integrates human interactivity, processes, and interpretive learning —a practical hotbed for affective empathy. HEEP results found that green infrastructure projects can facilitate empathy with nature in their users. If projects allow (or even facilitate) the experience of empathy with nature, they can result in promoting a slow change in attitude that can lead to a change in behavior in the way people interact with nature. People would begin to see nature as a meaningful and validated other that they can understand and feel compassion for (Matthias, 2020).

Another example of the application of an affective method of environmental education, applied to third grade students from an education unit, in the city of El Alto, La Paz-Bolivia, is directly related to the four levels of the proposed model, not directly citing the aesthetic experience that seems to be implied, as it is an experience with ornamental plants. This method, developed under the focus of environmental psychology and environmental education, aims to promote affective bonds with nature. The affective method consists of three phases: the cognitive, affective, and active phases. The first is to spread the theory about the importance of care for nature, the ecosystem and plant care guideline ornamental. The affective and active phase begins with the adoption of ornamental plants, and with the execution of activities such as the elaboration of a newspaper, shower of plants, letter to the plant, among others; with the aim of developing a relationship affective relationship between students and their plant as a tool for learning and developing pro-environmental behaviors (Choque, 2021).

Indeed, research suggests that emotions are crucial for ecological knowledge to translate into pro-environmental behavior. Empathy seems to be the initial stimulus to generate such emotions, in conjunction with the provision of information and knowledge (Myers et al., 2009).

This cycle of empathy-emotion-knowledge–behavior is used in our model, even though empathy is didactically located in the Engagement experience, it permeates the other Experiences as a potential trigger. The directed empathy behavior towards situations of suffering, both for humans and animals, has shown to influence pro-environmental arguments, so that incentivized empathy can evoke arguments and, consequently, conservation-related behaviors (Berenguer, 2010).

Therefore, empathy can be a tool for promoting and expanding the connection with nature, culminating in environmental preservation behaviors. Such conservation-oriented attitudes can be seen as the result of compassionate behavior towards other non-human living beings, so that for some authors, compassion is the next step after empathy, as it presupposes, by definition, an action aimed at alleviating the suffering of others (Goetz et al., 2010). Therefore, compassion has been considered a path to conservation, based on the Moralistic value of Biophilia (Lumber et al., 2017). In the context of our model, we recognize that empathy is a prerequisite for compassion. We believe that for a compassionate attitude to be fully realized, it must be preceded by the practice of empathy.

Values are the set of characteristics of a particular person (or organization) that determine how they behave and interact with other individuals and the environment. In the contemporary world, nature has been conceived as a set of objects that are recognized or valued based on people's perceptions. Values are provided by humans, and their most common expressions are, for example, the attribution of economic value to some natural resources or the attribution of property rights over green spaces (anthropocentric view). On the other hand, since the 1960s, another perspective recognizes that Nature has certain values that are inherent to it (non-anthropocentric view), regardless of its usefulness or potential benefit to humans (Gudynas, 2010).

The values can also be classified as self-transcendence or self-improvement (Steg et al., 2014), as presented in Figure 2.

The anthropocentric view can be instrumental or relational. In the instrumental view, the focus of value lies in the contributions that nature has to offer for people (creation of habitats, food, energy, ecosystem services, materials). In the relational view, in which nature-based health interventions fit, the focus of value lies on the good quality of life (physical and experiential interactions in nature, symbolic meaning, inspiration, physical, mental, and emotional health, cultural identity, social cohesion). In the intrinsic (non-anthropocentric) view, the focus of value is entirely directed towards nature, remembering that humans are also part of it (but without dichotomy), and there is a possibility of well-being that includes all beings, with respect to the Earth, evolutionary and ecological processes (DeVille et al., 2021), and the conservation of biodiversity, on which all depend on the planet.

Our aim is to highlight this concern in the outermost circle of the model, underscoring the inseparable connection between nature, health, well-being, and nature conservation. We firmly believe that these elements should be integrated into any nature-based health intervention.

2.4.2. Proposed activities for engagement experience

These activities encompass a diverse range of options, including informative materials, engagement actions utilizing digital resources, and artistic practices. These activities are designed to actively engage individuals with the natural world, fostering a deeper connection and understanding of its intricacies. Informative materials, such as educational resources and guides, provide valuable knowledge about the environment, ecosystems, and wildlife, empowering individuals to make informed decisions and take responsible actions. Additionally, engagement actions utilizing digital resources, such as interactive apps, virtual reality experiences, or citizen science platforms, offer innovative ways to explore and contribute to environmental research and conservation efforts.

2.4.2.1. Engagement materials and attitude and pro-environmental activities

In the proposed model, a series of activities with nature or activities that direct individuals' attention to nature are adopted as possibilities for engagement actions. These activities are compiled in the Inspiration Guide on Nature-Related Activities[1], organized by a multi-professional team, including mental health (Leão et al., 2023a), and in the Eco-Challenges Guide (see footnote 1) created by some of the authors of this article (Leão et al., 2023b), to maintain attention on pro-environmental actions. Both guides are available in electronic format and aim to sensitize and/or strengthen the connection with nature for moments when participants in nature-based interventions have returned to their daily lives. Among them, there are indications to explore the relationship between nature and art, nature sounds and images, and activities related to the proposed themes.

1 This material is available upon request from the corresponding author.

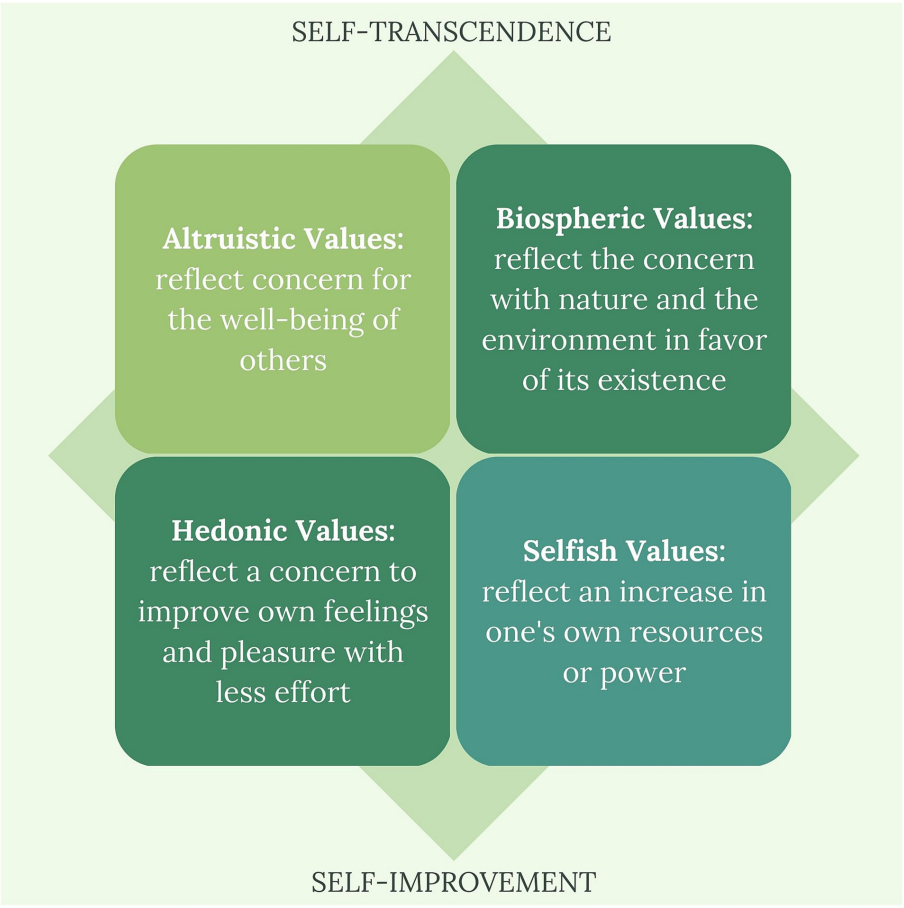

FIGURE 2
The values of self-transcendence and self-improvement that influence the relationship between humans and nature.

Digital technologies can also contribute to arousing people's interest in nature and, consequently, stimulating this contact, which is why they are included in the inspiration guide. Some of the resources presented in this material that deserve special mention in this area include the iNaturalist platform, which can be accessed through the website https://www.inaturalist.org or through the iNaturalist application, for Android or iOS (California Academy of Science, National Geographic Society, 2023) and the Wiki Aves platform, which can be accessed through the website www.wikiaves.com.br/ (WikiAves, 2023).

The iNaturalist platform combines technology with nature, allowing users to record, learn, and share their nature discoveries with the community during a walk in the park, for example. On the other hand, the Wiki Aves platform provides a literal Wikipedia about various bird species, making bird watching a more natural and approachable activity for people's daily lives.

In general, the digital technologies that dominate our daily lives, especially those that keep us connected to screens for long periods of time, are associated with factors that distance us from nature. However, currently, there are digital resources whose purpose is to stimulate and promote our contact with nature and contribute to scientific research through Citizen Science.

In addition, to strengthen the educational content (considered a key element for engagement), these materials direct users to other resources for sensitization and qualified information, such as the social media account @umtempocomenatureza, which presents posts about nature and health in Portuguese and English. On this platform, the sharing of experiences in nature, photos, and experiences with the hashtag #umtempocomenatureza are encouraged, considering that photography has become a great resource for sensitization and also for contemplation, and nature images have the potential to promote positive emotions when in non-natural environments (Dal Fabbro et al., 2021). A website that gathers information, commented scientific articles, book tips, music, etc. (Um tempo com e-Natureza, 2022) is also recommended as educational material to favor engagement actions.

While some people seek to learn about the nature that surrounds them, others seek to understand and even measure the benefits that connection with nature brings to health through digital resources. In the United States, the Nature Quant platform (NatureQuant, 2023) measures users' exposure to nature during exercise, and based on their diet, sleep quality, physical activity, and exposure to nature, it can create a personalized nature prescription for the user. This increases the individual's autonomy in seeking new ways to increase exposure to natural environments and thus promote connection with nature.

Lastly, artistic practices, such as nature-inspired photography, painting, or poetry, allow individuals to express their personal experiences and emotions, creating a bridge between art and nature. By embracing these proposed activities, individuals can actively immerse themselves in the beauty and importance of the natural

world, can take care of your health and well-being and promote a deeper connection and inspire a sense of responsibility for the preservation of nature.

The arts and creative expressions have been used to enhance educational programs that seek to promote connection with nature (Bruni et al., 2015), just as our model encourages participants to seek to photograph, draw, write, among other possibilities to anchor their experiences in nature. Social prescriptions can be encouraged after the intervention has taken place and can include arts-based activities that operationalize pathways that continue to promote participants' connection to the natural world (Richardson et al., 2020).

3. Discussion

In this study, we approach our proposal for a health intervention model based on nature, anchored in the concept of CAS, consisting of four types of experience that start from the interdependence of human health and well-being with the conservation of biodiversity to achieve a greater degree of connection with nature.

The activities that may compose a nature-based intervention for health and well-being can explore one or more paths that have been presented for each of the experiences that comprise the model. Even with better-established protocols, considering again that it is executed in CAS complex adaptive systems, which are open and self-organized, it is likely that one level of experience or another will be more predominant. This dependency relies on the characteristics of each individual who is participating or conducting the intervention, as well as the characteristics of the natural environment where it develops. Additionally, dynamic, emergent, and unpredictable factors further contribute to this complexity. Even with better-established protocols, considering again that it is executed in CAS complex adaptive systems, which are open and self-organized, it is likely that one level of experience or another will be more predominant, as it depends on the characteristics of each individual who is participating or conducting the intervention, as well as the characteristics of the natural environment where it develops and dynamic, emergent, and unpredictable factors. However, these four dimensions of experience should be integrated because the more the intervention is directed towards addressing them, the results may be more effective and long-lasting, which we are investigating.

The potential of nature to impact various aspects of human life is widely recognized. Nature provides us with essential resources such as food and raw materials, but it also profoundly influences our physical and psychological well-being through human interaction with the natural environment. In this model, human health and well-being are regarded as inseparable components of nature conservation.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is a consortium of various countries (including Brazil) and organizations, headquartered in Europe and supported by the United Nations Environment Programme (UNEP). Its objective is to strengthen the interface between scientific policies and ecosystems for the conservation of global biodiversity, considering human well-being and sustainable development. The IPBES coined the term "Nature's Contributions to People" (NCP) to exclusively describe such influences and benefits of nature to us (Díaz et al., 2018).

In the proposed model, environmental interpretation focused on key elements present in various natural environments was considered, as biodiversity plays a significant role in individuals' experiences. For example, bird watching was not only based on the authors' experiences, mostly bird watchers (including one ornithologist), but also its potential to evoke empathy and admiration (for beauty), provide the possibility to explore naturalist knowledge about birds, which goes beyond the aesthetic experience.

In addition, researchers (Methorst et al., 2021) have used indicators capable of quantifying natural aspects with ecological measures of species diversity as influential factors for human well-being, still, it seems that the abundance of bird species is as beneficial to the perception of satisfaction as financial abundance. This is another argument for reflecting on values that really matter. Interestingly, the same research' results did not show a correlation between mammal diversity and satisfaction, despite the well-known positive emotional response aroused by large mammals that always seem so charismatic. The explanation for this seems to be in the low encounter rate of city dwellers with these mammals, which tend to avoid urban environments, while small mammals are nocturnal and difficult to see in general. Birds, on the other hand, are perceived by humans even if they do not see them, since their songs are easily picked up by our hearing, in addition to being diurnal and often very active, even in urban areas. The other surprise revealed by this research is the absence of correlation between tree diversity and the perception of satisfaction and well-being. This result seems to suggest that it is the overall structure of the vegetation, and not the trees themselves, that can indicate natural diversity and result in the well-known positive relationship with well-being.

A recent study that explored the inner and outer values on the conservation attitudes of farmers from an Amazonia deforestation frontier (Mikołajczak et al., 2023) evidenced that inner motivations are capable of nurture pro-environment behaviors, based on self-transcendence and self-improvement values. Although extern factors, like poverty, material and health insecurity and less years of formal education may support economic development over nature conservation. In this way, we reinforce the need for a joint development among different areas like economic, social, health and environmental to achieve a common goal.

Lastly, but not less importantly, it is worth noting that the proposed intervention model is related to the main theories that have underpinned the human-nature relationship. Some theories seek to explain how nature-based interventions impact human physiology, pathophysiology, and influence various systems, such as the immune, endocrine, cardiovascular, and nervous systems, as well as explain these effects, such as the Theory of Physiological Recovery from Stress (Ulrich, 1983) and the Theory of Attention Restoration (Kaplan, 1995). To classify an intervention as healthcare, it requires articulation with other theoretical assumptions that extend beyond explaining its potential mechanisms. In this regard, Nursing is an inspirational model since it is a science centered around human care and encompasses the prescription of interventions for health promotion. By incorporating the principles and practices of Nursing, our aim is to ensure a comprehensive and holistic approach to health within the proposed model.

Florence Nightingale was the precursor of modern nursing and developed the Environmental Theory, dated from 1859, which is still considered current and relevant. According to her, any external environment to human beings (including nature) is capable of interfering in the health-disease process, that is, the promotion and/or recovery of health are directly influenced by the environment in which an individual is inserted (Medeiros et al., 2015).

Therefore, it is a fundamental part of care to consider that human beings are part of nature and, therefore, when the environment is unhealthy, human beings are also unhealthy. In practice, Florence left a legacy about the role of a caregiver as the one responsible for maintaining the external environment as balanced as possible so that the internal environment (human being) can regenerate. Thus, keeping well-ventilated, clean, and well-lit areas, and offering a greater sense of well-being through connection with nature can contribute decisively to achieving greater health (Medeiros et al., 2015; Riegel et al., 2021).

Another theorist is Margaret Jean Watson, who in 1979 completed her first theoretical reflection and still today continues to refine and teach her way of understanding the role of nursing in care, called the Theory of Human Caring (Tonin et al., 2017). Its application is based on the premise of offering transpersonal care that is capable of surpassing the punctual moment of encounter between caregiver and cared for, with a focus on a common goal: the promotion of regeneration through the Clinical Caritas Process, which contains 10 fundamental elements that must be considered at the time of interaction and are based on the permanent belief that any being in need of care is a member of the universe and deserving of respect (Savieto and Leão, 2016; Watson Caring Science Institute, 2023), which includes the planet itself. Among them are the formation of a humanistic-altruistic value system, the cultivation of sensitivity to oneself and others, the systematic use of the scientific method of problem-solving to make decisions, the provision of a mental, physical, sociocultural, and spiritual supportive, protective, and/or corrective environment, and the acceptance of existential and phenomenological forces, considering that the care environment is the one that offers potential development while allowing the person to choose the best action for themselves at a given moment.

From the perspective of complex adaptive systems, Martha Elisabeth Rogers' Humanistic and Humanitarian Theory can be adopted as the background for the prescription of "A Time with e-Natureza (e-Nature)." For her, nursing is understood as the science and art of promoting interaction between human beings and nature, aiming at maintaining their integrity and directing standardization. This theory is based on the principles of integrality, resonance, and helicity, as well as the concepts of energy fields, such as open systems (in constant exchange). Therefore, it is not possible to separate the understanding of the human being from their environment. The focus of this theory is the relationship between the human being and their environment, and the professional will have their action guided by this exchange, seeking an adequate therapy to provide conditions for pattern reorganization, intervening both in the environment and in the human being. Rogers' theory reinforces the assumption that the human being, contrary to what is often observed, is not an isolated entity. Building upon this concept, she establishes her interventions, recognizing that the human being is a dynamic process of mutual interaction between the individual and the environment, considering various variables involved. It also considers that the identification of individuals and the reflection of their totality are life patterns that allow self-regulation, rhythm, and dynamism, providing unity to the diversity that reflects a creative and dynamic universe (Rogers, 1970). The very idea of biophilia originates from an understanding of evolution, whereby for over 99% of our species' history, biological development occurred in adaptive response to natural forces that were non-artificial or human-created, and thus within complex adaptive systems.

To assess the practical applicability of this model in healthcare, for example, we can consider the NANDA International (NANDA-I) classification systems for nursing diagnoses, the Nursing Interventions Classification (NIC), and the Nursing Outcomes Classification (NOC) (Fennelly et al., 2021).

For this nursing taxonomy, the proposed model can be useful for nursing diagnosis (Herdman et al., 2021) such as stress overload, characterized by excessive amounts and types of demands that require action, or anxiety, characterized by a vague and uncomfortable feeling of discomfort or fear, accompanied by an autonomic response whose source is often non-specific or unknown to the individual. It can also be useful for other nursing diagnosis: health promotion, characterized by clinical judgment regarding motivation and the desire to increase well-being and achieve human potential for health. Health promotion responses can exist in individuals, families, groups, or communities. The intervention can also be applied to the diagnosis of Improved Self-Care Capacity, which involves engaging in activities for oneself to achieve health goals and can be strengthened (Herdman et al., 2021). Regarding intervention, the model can be framed within the NIC in the Environmental Management intervention, which assumes the optimal use of the environment for therapeutic benefit, sensory appeal, and psychological well-being, or in Health Education, which involves developing and providing individual or group instruction and learning experiences to facilitate voluntary adaptation of health-related behavior in individuals, families, groups, or communities, such as the materials that make up the proposed engagement experience in the model (Butcher et al., 2020).

However, it is necessary to recognize the effectiveness of the proposed intervention. The systematic use of outcomes to evaluate healthcare began when Florence Nightingale recorded and analyzed healthcare conditions and patient outcomes during Crimean War in the 19th century. Efforts to evaluate medical practice began in the early 20th century when Codman, a surgeon from Boston, proposed using outcome-based measures as indicators of the quality of medical care (Riegel et al., 2021).

Therefore, for outcome evaluation, the NOC taxonomy provides for the use of scales, such as the measurement of personal well-being, which are related to diagnoses of health promotion and well-being. The lexical and taxonomic development that provides standardized terms in a constructed classification stimulates the formulation of an inductive theory and the empirical testing of deductive theories. And through the accumulation of research results supporting the effects of interventions on patient outcomes for specific diagnoses, among other patient characteristics, evidence-based practice protocols can be developed, therefore these taxonomies were considered in this study (Moorhead et al., 2020).

Indeed, the establishment of diagnoses and the evaluation of outcomes encompass a wide range of validated scales for health outcomes, extending beyond the NANDA-I classification system. However, it serves as a backdrop to indicate that this rationale should be considered in the implementation not only of the model presented in this article but also of others proposing diverse nature-based interventions.

Looking to the future, interest in forms of indirect contact with nature in three-dimensional, immersive, and non-immersive virtual environments is growing. A project carried out with sounds of nature for recovery from intentional acute stress using a virtual tool called TSST, in which autonomic and endocrine stress responses were explored along with subjective assessments. The participants were submitted to such an

experience and later to virtual reality (VR) with digital natural environments. The volunteers were divided into three groups, one with virtual forest and sound, one with virtual forest without sound and a control without virtual forest or sounds. Natural sounds of birds and water were used due to their beneficial properties mentioned in the literature. The study demonstrated that sounds of nature facilitate recovery from stress when used in green virtual environments indicated by the recovery of cardiac regulation, contributing to the increase of parasympathetic activity (Annerstedt et al., 2013).

Although our model was primarily designed to support interventions involving direct contact with nature, it is possible to develop interventions based on the model that utilize indirect contact through immersive reality. However, it is important to be aware that such interventions may have limitations compared to direct contact, as there are inherent differences and unique benefits associated with direct contact with nature. It is worth noting, however, that virtual experiences should not replace real experiences, but can be useful in contexts where they are not possible, as for hospitalized patients. Activities proposed in the model can be recorded, such as a birding-watching activity in a natural environment, environmental education content can be inserted, and technologies can be developed that will expand the multisensory and interactivity experience, beyond hearing and vision that a 3D experience normally allows in which some device of odor in the environment can be associated. It is, however, an intervention that will have to be tested in relation, mainly, to the Engagement experience that the model proposes, which already configures the biggest challenge even in the perspective of direct contact.

Nature-based interventions in virtual reality following this model would have been useful during the COVID-19 pandemic that led to a global lockdown to contain the spread of the virus and "flatten the curve" of the pandemic, which resulted in far-reaching effects in different strata of life including the increase in mental health, well-being, and quality of life challenges, among others (Onyeaka et al., 2021). Nature-based 2D and 3D experiences with forests, beach and water were helpful in managing stress during the pandemic (Beverly et al., 2022; Riches et al., 2023). This situation made people to reflect on how much direct or even indirect contact with nature could be useful for mental health. It is possible to infer that in the absence of urgent measures to mitigate climate change, the likelihood of future pandemics may increase. However, by reflecting on the lessons learned from the current pandemic, society can better prepare to confront such challenges. Nature-based interventions can play a crucial role in this preparation, enabling effective responses and mitigating the impact of future pandemics. Recognizing the importance of nature-based interventions bolsters resilience and fosters well-being in the face of adversity. These interventions harness the healing power of nature, offering a valuable tool to support individuals and communities in times of crisis.

Currently, there are some virtual reality simulators and apps that allow users to explore and interact with beautiful natural landscapes, including forests, beaches, and mountains. Others can offer an immersive experience in the underwater world, allowing users to interact with different marine species and ecosystems. Submarines or virtual encounters with wild animals in their natural habitat. These technologies can also produce well-being (Frewen et al., 2020; Gerçeker et al., 2020; Adhyaru and Kemp, 2022). Although such experiences can help in the levels of connection with nature, their reach both for human health and for the conservation of biodiversity are still not well established and also were not built considering the four proposed levels of experiences. New applications can be developed in the light of this model so that educational and active experiences are incorporated, which enables the expected results that it proposes to achieve. It is noteworthy that the current model needs to be tested to validate its effectiveness in the real world. To this end, a randomized controlled clinical trial is underway that has already included more than 400 participants in five natural units (urban, peri-urban, and rural) (ClinicalTrials.gov ID NCT05486156). This clinical trial aims to assess the mean change in the World Health Organization Wellness Index, changes in self-perceived happiness, vitality, connectedness, and engagement with nature at pre-intervention, post-intervention, and 30-day follow-up moments. In the intervention group (based on the proposed model) in addition to including walking in nature with attention to the senses (which was carried out by the control group) the researchers associate other elements of a cognitive-behavioral nature, aiming at human and non-human well-being. Thus, in this nature-based health intervention, activities related to four types of experience are proposed (1- Aesthetic and Emotional; 2- Multisensory integration; 3 - Knowledge; 4- Engagement) according to the activities proposed in this model.

Understanding the relationship of interdependence between all beings, facilitated by the four levels of experience of the proposed model, from corresponding activities can configure a relationship between human beings and nature in the future in the medium and long term.

Data availability statement

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

Author contributions

EL wrote the first draft of the manuscript. EL, EH-Z, and RS contributed to conception and design of the study. KP, LL, and GB revised the manuscript critically. All authors wrote sections of the manuscript and approved the submitted version.

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Conflict of interest

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

Publisher's note

References

Adhyaru, J. S., and Kemp, C. (2022). Virtual reality as a tool to promote wellbeing in the workplace. *Digit. Health.* 8:205520762210844. doi: 10.1177/20552076221084473

Adisasmito, W. B., Almuhairi, S., Behravesh, C. B., Bilivogui, P., Bukachi, S. A., Casas, N., et al. (2022). One health: a new definition for a sustainable and healthy future. One health high-level expert panel (OHHLEP). *PLoS Pathog.* 18:e1010537. doi: 10.1371/journal.ppat.1010537

Annerstedt, M., Jönsson, P., Wallergård, M., Johansson, G., Karlson, B., Grahn, P., et al. (2013). Inducing physiological stress recovery with sounds of nature in a virtual reality forest-results from a pilot study. *Physiol. Behav.* 118, 240–250. doi: 10.1016/j.physbeh.2013.05.023

Antonelli, M., Donelli, D., Carlone, L., Maggini, V., Firenzuoli, F., and Bedeschi, E. (2021). Effects of forest bathing (shinrin-yoku) on individual wellbeing: an umbrella review. *Int. J. Environ. Health Res.* 32, 1842–1867. doi: 10.1080/09603123.2021.1919293

Bailey, A. W., and Kang, H. K. (2022). Walking and sitting outdoors: which is better for cognitive performance and mental states? *Int. J. Environ. Res. Public Health* 19:16638. doi: 10.3390/ijerph192416638

Barragan-Jason, G., Loreau, M., Mazancourt, C., Singer, M. C., and Parmesan, C. (2023). Psychological and physical connections with nature improve both human well-being and nature conservation: a systematic review of meta-analyses. *Biol. Conserv.* 277:109842. doi: 10.1016/j.biocon.2022.109842

Bell, R., Irvine, K. N., Wilson, C., and Warber, S. L. (2014). Dark nature: exploring potential benefits of nocturnal nature-based interaction for human and environmental health. *Eur J Ecopsychol.* 5, 1–15.

Berenguer, J. (2010). The effect of empathy in environmental moral reasoning. *Environ. Behav.* 42, 110–134. doi: 10.1177/0013916508325892

Beverly, E., Hommema, L., Coates, K., Duncan, G., Gable, B., Gutman, T., et al. (2022). A tranquil virtual reality experience to reduce subjective stress among COVID-19 frontline healthcare workers. *PLoS One* 17:e0262703. doi: 10.1371/journal.pone.0262703

Bircher, J., and Kuruvilla, S. (2014). Defining health by addressing individual, social, and environmental determinants: new opportunities for health care and public health. *J. Public Health Policy* 35, 363–386. doi: 10.1057/jphp.2014.19

Bjelajac, D., Đerčan, B., and Kovačić, S. (2021). Dark skies and dark screens as a precondition for astronomy tourism and general well-being. *Inf Technol Tourism.* 23, 19–43. doi: 10.1007/s40558-020-00189-9

Bratman, G. N., Hamilton, J. P., Hahn, K. S., Daily, G. C., and Gross, J. J. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proc Nat Acad Sci.* 112, 8567–8572. doi: 10.1073/pnas.1510459112

Bruni, C. M., Winter, P. L., Schultz, P. W., Omoto, A., and Tabanico, J. J. (2015). Getting to know nature: evaluating the effects of the get to know program on children's connectedness with nature. *Environ Edu Res.* 23, 43–62. doi: 10.1080/13504622.2015.1074659

Buchan, N. R., Brewer, M. B., Grimalda, G., Wilson, R. K., Fatas, E., and Foddy, M. (2011). Global social identity and global cooperation. *Psychol. Sci.* 22, 821–828. doi: 10.1177/0956797611409590

Butcher, H.K., Dochterman, J.M., Bulechek, G.M., and Wagner, C.M. (2020). *Classificação das Intervenções de Enfermagem*. Barueri, São Paulo: Guanabara Koogan.

California Academy of Science, National Geographic Society. (2023). iNaturalist. Available at: https://www.inaturalist.org/ (Accessed May 17, 2023).

Chaffee, M. W., and McNeill, M. M. (2007). A model of nursing as a complex adaptive system. *Nurs. Outlook* 55, 232–241.e3. doi: 10.1016/j.outlook.2007.04.003

Choque, J. T. P. (2021). The role affectivity in environmental education. *Rev. Investig. Psicol.* 25, 101–112.

Civitello, D. J., Cohen, J., Fatima, H., Halstead, N. T., Liriano, J., McMahon, T. A., et al. (2015). Biodiversity inhibits parasites: broad evidence for the dilution effect. *Proc. Natl. Acad. Sci. U. S. A.* 112, 8667–8671. doi: 10.1073/pnas.1506279112

Collaborative for Academic, Social, and Emotional Learning. (2022). Fundamentals of SEL. Available at: https://casel.org/fundamentals-of-sel/what-is-the-casel-framework/ (Accessed March 4, 2023).

Creswell, J. D. (2017). Mindfulness interventions. *Annu. Rev. Psychol.* 68, 491–516. doi: 10.1146/annurev-psych-042716-051139

Dal Fabbro, D., Catissi, G., Borba, G., Lima, L., Hingst-Zaher, E., Rosa, J., et al. (2021). E-Nature positive emotions photography database (e-NatPOEM): affectively rated nature images promoting positive emotions. *Sci. Rep.* 11:11696. doi: 10.1038/s41598-021-91013-9

Der-Karabetian, A., Cao, Y., and Alfaro, M. (2014). Sustainable behavior, perceived globalization impact, world-mindedness, identity and perceived risk in college samples from the United States, China, and Taiwan. *Ecopsyc.* 6, 218–233. doi: 10.1089/eco.2014.0035

DeVille, N. V., Tomasso, L. P., Stoddard, O. P., Wilt, G. E., Horton, T. H., Wolf, K. L., et al. (2021). Time spent in nature is associated with increased pro-environmental attitudes and behaviors. *Int. J. Environ. Res. Public Health* 18:14. doi: 10.3390/ijerph18147498

Di Dio, C., Ardizzi, M., Massato, D., Cesare, G., Gilli, G., Marchetti, A., et al. (2016). Human, nature, dynamism: the effects of content and movement perception on brain activations during the aesthetic judgment of representational paintings. *Front. Hum. Neurosci.* 9:705. doi: 10.3389/fnhum.2015.00705

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R., Molnár, Z., et al. (2018). Assessing nature's contributions to people. *Science* 359, 270–272. doi: 10.1126/science.aap8826

Dirzo, R., Young, H. S., Galetti, M., Ceballos, G., Isaac, N. J., and Collen, B. (2014). Defaunation in the Anthropocene. *Science* 345, 401–406. doi: 10.1126/science.1251817

Dornelas, M., Gotelli, N. J., McGill, B., Shimadzu, H., Moyes, F., Sievers, C., et al. (2014). Assemblage time series reveal biodiversity change but not systematic loss. *Science* 344, 296–299. doi: 10.1126/science.1248484

Eggemeier, M. T. (2014). Ecology and vision: contemplation as environmental practice. *Worldviews* 18:1. doi: 10.1163/15685357-01801001

Eklund, J. H., and Meranius, M. S. (2021). Toward a consensus on the nature of empathy: a review of reviews. *Patient Educ. Couns.* 104, 300–307. doi: 10.1016/j.pec.2020.08.022

Fennelly, O., Grogan, L., Reed, A., and Hardiker, N. R. (2021). Use of standardized terminologies in clinical practice: a scoping review. *Int. J. Med. Inform.* 149:104431. doi: 10.1016/j.ijmedinf.2021.104431

Fingerhut, J., and Prinz, J. (2018). Wonder, appreciation and the value of art. *Prog. Brain Res.* 237, 107–128. doi: 10.1016/bs.pbr.2018.03.004

Frewen, P., Mistry, D., Zhu, J., Kielt, T., Wekerle, C., Lanius, R. A., et al. (2020). Proof of concept of an eclectic, integrative therapeutic approach to mental health and well-being through virtual reality technology. *Front. Psychol.* 11:858. doi: 10.3389/fpsyg.2020.00858

Frumkin, H., Bratman, G. N., Breslow, S. J., Cochran, B., Kahn, P. H. Jr., Lawler, J. J., et al. (2017). Nature contact and human health: a research agenda. *Environ. Health Perspect.* 125:075001. doi: 10.1289/EHP1663

Garza-Terán, G., Tapia-Fonllem, C., Fraijo-Sing, B., Borbón-Mendívil, D., and Poggio, L. (2022). Impact of contact with nature on the wellbeing and nature connectedness indicators after a desertic outdoor experience on Isla Del Tiburon. *Front. Psychol.* 13:864836. doi: 10.3389/fpsyg.2022.864836

Geng, L., Xu, J., Ye, L., Zhou, W., and Zhou, K. (2015). Connections with nature and environmental behaviors. *PLoS One* 10:1. doi: 10.1371/journal.pone.0127247

Gerçeker, G. Ö., Ayar, D., Özdemir, E. Z., and Bektaş, M. (2020). Effects of virtual reality on pain, fear and anxiety during blood draw in children aged 5-12 years old: a randomised controlled study. *J. Clin. Nurs.* 29, 1151–1161. doi: 10.1111/jocn.15173

Goetz, J. L., Keltner, D., and Simon-Thomas, E. (2010). Compassion: an evolutionary analysis and empirical review. *Psychol. Bull.* 136, 351–374. doi: 10.1037/a0018807

Gudynas, E. (2010). The biocentric path: intrinsic values, nature rights and ecological justice. *Tab. Rasa.* 13, 45–71.

Ham, S.H. (1992). *Environmental interpretation. A practical guide for people with big ideas*. Golden, CO: North American Press.

Ham, S. (2007). Can interpretation really make a difference? Answers to four questions in cognitive and behavioral psychology, In National Association for interpretation: Proceedings of the interpreting world heritage conference (Fort Collins, Colorado, USA)

Herdman, T.H., Kamitsuru, S., and Lopes, C.T. (2021). *Diagnósticos de Enfermagem da NANDA-I: Definições e Classificação - 2021-2023*. Porto Alegre: Artmed.

Hopfinger, J. B., and West, V. M. (2006). Interactions between endogenous and exogenous attention on cortical visual processing. *NeuroImage* 31, 774–789. doi: 10.1016/j.neuroimage.2005.12.049

Isanta, L. (2018). *La Apreciatividad: El arte de percibir lo valioso*. Buenos Aires: Ediciones Granica.

Kaplan, S. (1995). The restorative benefits of nature: toward an integrative framework. *J. Environ. Psychol.* 15, 169–182. doi: 10.1016/0272-4944(95)90001-2

Kaplan, R., and Kaplan, S. (1989). *The experience of nature: a psychological perspective*. New York: Cambridge University Press.

Kellert, S. H. (1993). "The biological basis for human values of nature" in *The biophilia hypothesis*. eds. S. R. Kellert and E. O. Wilson (Washington, DC: Island Press), 42–69.

Kellert, S. R., Case, D. J., Escher, D., Witter, D. J., Mikels-Carrasco, J., and Seng, P. T. (2017). Data from: the nature of Americans: disconnection and recommendations for reconnection. *Natl Rep.*

Keniger, L., Gaston, K., Irvine, K., and Fuller, R. (2013). What are the benefits of interacting with nature? *Int. J. Environ. Res. Public Health* 10, 913–935. doi: 10.3390/ijerph10030913

Kesebir, S., and Kesebir, P. (2017). A growing disconnection from nature is evident in cultural products. *Perspect. Psychol. Sci.* 12, 258–269. doi: 10.1177/1745691616662473

Kolb, B., and Whishaw, I. (1998). Brain plasticity and behavior. *Annu. Rev. Psychol.* 49, 43–64. doi: 10.1146/annurev.psych.49.1.43

Korpela, K. M., Hartig, T., Kaiser, F. G., and Fuhrer, U. (2001). Restorative experience and self-regulation in favorite places. *Environ. Behav.* 33, 572–589. doi: 10.1177/0013916601219731

Lahart, I., Darcy, P., Gidlow, C., and Calogiuri, G. (2019). The effects of Green exercise on physical and mental wellbeing: a systematic review. *Int. J. Environ. Res. Public Health* 16:1352. doi: 10.3390/ijerph16081352

Lanza, K., Alcazar, M., Chen, B., and Kohl, H. W. (2023). Connection to nature is associated with social-emotional learning of children. *Cur. Res. Ecol. Soc. Psychol.* 4:100083. doi: 10.1016/j.cresp.2022.100083

Leão, E.R., Bernardes, L., Lima, L., Tiemi, D., Brito, D., Zoldan, L., et al. (2023a). *Um tempo com e-Natureza: inspiration guide on nature-related activities*. São Paulo: Albert Einstein Education and Research Center.

Leão, E.R., Bernardes, L., Lima, L., Tiemi, D., Brito, D., Zoldan, L., et al (2023b). *Um tempo com e-Natureza: eco-challenges guide*. São Paulo: Albert Einstein Education and Research Center.

Lee, H., Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P., et al. (2023) Synthesis report of the Ipcc sixth assessment report (AR6). Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_LongerReport.pdf

Levin, S. (1998). Ecosystems and the biosphere as complex adaptive systems. *Ecosystems* 1, 431–436. doi: 10.1007/s100219900037

Li, Q. (2019). Effect of forest bathing (shinrin-yoku) on human health: a review of the literature. *Sante Publique* S1, 135–143. doi: 10.3917/spub.190.0135

Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algoquin Books of Chapel Hill.

Lumber, R., Richardson, M., and Sheffield, D. (2017). Beyond knowing nature: contact, emotion, compassion, meaning, and beauty are pathways to nature connection. *PLoS One* 12:e0177186. doi: 10.1371/journal.pone.017718

Lyubomirsky, S., King, L., and Diener, E. (2005). The benefits of frequent positive affect: does happiness lead to success? *Psychol. Bull.* 131, 803–855. doi: 10.1037/0033-2909.131.6.803

Macaluso, E., and Maravita, A. (2010). The representation of space near the body through touch and vision. *Neuropsych.* 48, 782–795. doi: 10.1016/j.neuropsychologia.2009.10.010

Mace, G. M. (2014). Whose conservation? *Science* 345, 1558–1560. doi: 10.1126/science.1254704

Mackay, C. M. L., and Schmitt, M. T. (2019). Do people who feel connected to nature do more to protect it? A meta-analysis. *J. Environ. Psychol.* 65:101323. doi: 10.1016/j.jenvp.2019.101323

Martin, L., White, M. P., Hunt, A., Richardson, M., Pahl, S., and Burt, J. (2020). Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviors. *J. Environ. Psychol.* 68:101389. doi: 10.1016/j.jenvp.2020.101389

Matthias, M.Y. (2020) Evaluating the capacity of green infrastructure projects to facilitate empathy with nature in their users. Honor Thesis. Boulder (CO): University of Colorado Boulder

Mayer, F. S., and Frantz, C. M. P. (2004). The connectedness to nature scale: a measure of individuals' feeling in community with nature. *J. Environ. Psychol.* 24, 503–515. doi: 10.1016/j.jenvp.2004.10.001

Myers, F. S., Frantz, C. M. P., Bruehlman-Senecal, E., and Dolliver, K. (2009). Why is nature beneficial? The role of connectedness to nature. *Environ. Behav.* 41, 607–643. doi: 10.1177/0013916508319745

McGill, E., Er, V., Penney, T., Egan, M., White, M., Meier, P., et al. (2021). Evaluation of public health interventions from a complex systems perspective: a research methods review. *Soc. Sci. Med.* 272:113697. doi: 10.1016/j.socscimed.2021.113697

Meadows, D. H. (2008). *Thinking in systems: a primer*. Vermont, USA: Chelsea Green Publishing.

Medeiros, A. B., Enders, B. C., and Lira, A. L. (2015). The Florence Nightingale's environmental theory: a critical analysis. *Esc Anna Nery.* 74:3. doi: 10.1590/0034-7167-2020-0139

Menardo, E., Di Marco, D., Ramos, S., Brondino, M., Arenas, A., Costa, P., et al. (2022). Nature and mindfulness to cope with work-related stress: a narrative review. *Int. J. Environ. Res. Public Health* 19:10. doi: 10.3390/ijerph19105948

Methorst, J., Rehdanz, K., Mueller, T., Hansjürgens, B., Bonn, A., and Böhning-Gaese, K. (2021). The importance of species diversity for human well-being in Europe. *Ecol. Econ.* 181:106917. doi: 10.1016/j.ecolecon.2020.106917

Mikołajczak, K. M., Barlow, J., Lees, A. C., Ives, C. D., Strack, M., Almeida, O. T., et al. (2023). Evaluating the influence of nature connection and values on conservation attitudes at a tropical deforestation frontier. *Conserv. Biol.* 37:e14067. doi: 10.1111/cobi.14067

Mizon, B. (2002). *Light pollution: Responses and remedies (the Patrick Moore practical astronomy series)*. London: Springer

Moorhead, S., Swanson, E., Johnson, M., and Maas, M. (2020). *NOC-Classificação dos Resultados de Enfermagem*. Barueri, São Paulo: Guanabara Koogan.

Morin, E. (2010). *Ciência com Consciência*. Rio de Janeiro: Bertrand Brasil.

Myers, O. E. Jr., Saunders, C. D., and Bexell, S. (2009). "Fostering empathy with wildlife: factors affecting free-choice learning for conservation concern and behavior" in *Free-choice learning and the environment*. eds. J. Falk, J. Heimlich and S. Foutz (Lanham, Maryland: AltaMira Press), 39–55.

NatureQuant. (2023). NatureDose app. Available at: https://www.naturequant.com/naturedose/ (Accessed May 17, 2023)

Nisbet, E. K., Zelenski, J. M., and Murphy, S. A. (2011). Happiness is in our nature: exploring nature relatedness as a contributor to subjective well-being. *J. Happiness Stud.* 12, 303–322. doi: 10.1007/s10902-010-9197-7

Omura, J. D., Ussery, E. N., Loustalot, F., Fulton, J. E., and Carlson, S. A. (2019). Walking as an opportunity for cardiovascular disease prevention. *Prev. Chronic Dis.* 16:16. doi: 10.5888/pcd16.180690

Onyeaka, H., Anumudu, C. K., Al-Sharify, Z. T., Egele-Godswill, E., and Mbaegbu, P. (2021). COVID-19 pandemic: a review of the global lockdown and its far-reaching effects. *Sci. Prog.* 104:368504211019854. doi: 10.1177/00368504211019854

Peacocke, A. (2023). "Aesthetic experience" in *The Stanford encyclopedia of philosophy*. eds. E. N. Zalta and U. Nodelman (Palo Alto, CA: Stanford University)

Perrin, J. L., and Benassi, V. A. (2009). The connectedness to nature scale: a measure of emotional connection to nature? *J. Environ. Psychol.* 29, 434–440. doi: 10.1016/j.jenvp.2009.03.003

Plsek, P. E., and Greenhalgh, T. (2001). Complexity science: the challenge of complexity in health care. *BMJ* 323, 625–628. doi: 10.1136/bmj.323.7313.625

Pocock, M. J. O., Hamlin, I., Christelow, J., Passmore, H. A., and Richardson, M. (2023). The benefits of citizen science and nature-noticing activities for well-being, nature connectedness and pro-nature conservation behaviours. *People Nature* 5, 591–606. doi: 10.1002/pan3.10432

Pörtner, H.O., Roberts, D.C., Tignor, M., Poloczanska, E.S., Mintenbeck, K., Alegría, A., et al. (2022). Data from: Intergovernmental Panell on climate change 2022: Impacts, adaptation, and vulnerability. Cambridge, UK: Cambridge University. Available at: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FrontMatter.pdf

Prato-Previde, E., Ricci, E. B., and Colombo, E. S. (2022). The complexity of the human-animal bond: empathy, attachment and anthropomorphism in human-animal relationships and animal hoarding. *Animals* 12:2835. doi: 10.3390/ani12202835

Pritchard, A., Richardson, M., Sheffield, D., and McEwan, K. (2020). The relationship between nature connectedness and eudaimonic well-being: a meta-analysis. *J. Happiness Stud.* 21, 1145–1167. doi: 10.1007/s10902-019-00118-6

Pyle, R.M. (1993). *The thunder tree: Lessons from an urban wildland*. Boston: Houghton Mifflin.

Ratcliffe, E., Gatersleben, B., and Sowden, P. T. (2013). Bird sounds and their contributions to perceived attention restoration and stress recovery. *J. Environ. Psychol.* 36, 221–228. doi: 10.1016/j.jenvp.2013.08.004

Ratcliffe, E., and Korpela, K. M. (2016). Memory and place attachment as predictors of imagined restorative perceptions of favourite places. *J. Environ. Psychol.* 48, 120–130. doi: 10.1016/j.jenvp.2016.09.005

Richardson, M., and Butler, C. W. (2022). *The nature connection handbook: A guide for increasing people's connection with nature*. Derby, United Kingdom.

Richardson, M., Dobson, J., Abson, D. J., Lumber, R., Hunt, A., Young, R., et al. (2020). Applying the pathways to nature connectedness at a societal scale: a leverage points perspective. *Ecosyst. People.* 16, 387–401. doi: 10.1080/26395916.2020.1844296

Richardson, M., Hamlin, I., Elliott, L. R., and White, M. P. (2022). Country-level factors in a failing relationship with nature: nature connectedness as a key metric for a sustainable future. *Ambio* 51, 2201–2213. doi: 10.1007/s13280-022-01744-w

Richardson, M., Hussain, Z., and Griffiths, M. D. (2018). Problematic smartphone use, nature connectedness, and anxiety. *J. Behav. Addict.* 7, 109–116. doi: 10.1556/2006.7.2018.10

Riches, S., Taylor, L., Jeyarajaguru, P., Veling, W., and Valmaggia, L. (2023). Virtual reality and immersive technologies to promote workplace wellbeing: a systematic review. *J. Ment. Health* 1, 1–21. doi: 10.1080/09638237.2023.2182428

Riegel, F., Crossetti, M., Martini, J., and Nes, A. (2021). Florence Nightingale's theory and her contributions to holistic critical thinking in nursing. *Rev. Bras. Enferm.* 74:e20200139. doi: 10.1590/0034-7167-2020-0139

Rogers, M.E. (1970). *An introduction to the theoretical basis of nursing*. Philadelphia: F. A. Davis Co, *19*, 541

Romanello, M., Di Napoli, C., Drummond, P., Green, C., Kennard, H., Lampard, P., et al. (2022). The 2022 report of the lancet countdown on health and climate change: health at the mercy of fossil fuels. *Lancet* 400, 1619–1654. doi: 10.1016/S0140-6736(22)01540-9

Sarasso, P., Neppi-Modona, M., Sacco, K., and Ronga, I. (2020). Stopping for knowledge: the sense of beauty in the perception-action cycle. *Neurosci. Biobehav. Rev.* 118, 723–738. doi: 10.1016/j.neubiorev.2020.09.004

Savieto, R. M., and Leão, E. R. (2016). Nursing assistance and Jean Watson: a reflection on empathy. *Esc. Anna Nery.* 20:1. doi: 10.5935/1414-8145.20160026

Schindler, I., Hosoya, G., Menninghaus, W., Beermann, U., Wagner, V., Eid, M., et al. (2017). Measuring aesthetic emotions: a review of the literature and a new assessment tool. *PLoS One* 12:e0178899. doi: 10.1371/journal.pone.0178899

Schultz, P. W. (2002). "Inclusion with nature: the psychology of human-nature relations" in *Psychology of sustainable development*. eds. P. Schmuck and W. P. Schultz (Norwell, MA: Kluwe Academic), 62–78.

Seligman, M.E.P. (2011). *Flourishing: A visionary and new understanding of happiness and well-being*. New York: Free Press.

Soga, M., and Gaston, K. J. (2016). Extinction of experience: the loss of human-nature interactions. *Front. Ecol. Environ.* 14, 94–101. doi: 10.1002/fee.1225

Soga, M., and Gaston, K. J. (2023). Global synthesis reveals heterogeneous changes in connection of humans to nature. *One Earth.* 6, 131–138. doi: 10.1016/j.oneear.2023.01.007

Solé, R., and Levin, S. (2022). Ecological complexity and the biosphere: the next 30 years. *Philos. Trans. R. Soc. Lond. Ser. B Biol. Sci.* 377:20210376. doi: 10.1098/rstb.2021.0376

Steg, L., Perlaviciute, G., van der Werff, E., and Lurvink, J. (2014). The significance of hedonic values for environmentally relevant attitudes, preferences and actions. *Environ. Behav.* 46, 163–192. doi: 10.1177/0013916512454730

Stern, P. C. (2002). New environmental theories: toward a coherent theory of environmentally significant behavior. *J. Soc. Issues* 56, 407–424. doi: 10.1111/0022-4537.00175

Stobbe, E., Sundermann, J., Ascone, L., and Kühn, S. (2022). Birdsongs alleviate anxiety and paranoia in healthy participants. *Sci. Rep.* 12:16414. doi: 10.1038/s41598-022-20841-0

Tilden, F. (2009). *Interpreting our heritage*. Chapel Hill, NC: The University of North Carolina Press.

Tonin, L., Nascimento, J., Lacerda, J., Favero, L., Gomes, I., and Denipote, A. (2017). Guide to deliver the elements of the clinical caritas process. *Esc. Anna Nery.* 21:e20170034. doi: 10.1590/2177-9465-EAN-2017-0034

Ulrich, R. (1983). Aesthetic and affective response to natural environment. *Beh Nat Environ.* 6:85. doi: 10.1007/978-1-4613-3539-9_4

Um tempo com e-Natureza. (2022). e-Natureza. Available at: (English versionhttps://www.enatureza.com/en) and https://www.enatureza.com/ (Portuguese version) (Accessed May 17, 2023)

United Nations. (2015) Transforming our world: the 2030 agenda for sustainable development. Available at: https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf (Accessed February 10, 2023)

United Nations. (2019). Department of Economic and Social Affairs, population division. World urbanization prospects, the 2018 revision. Available at: https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf (Accessed February 10, 2023)

Wang, R., and Zhao, J. (2020). Effects of evergreen trees on landscape preference and perceived restorativeness across seasons. *Landsc. Res.* 45, 649–661. doi: 10.1080/01426397.2019.1699507

Warburton, D. E., Nicol, C. W., and Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *CMAJ* 174, 801–809. doi: 10.1503/cmaj.051351

Watson Caring Science Institute. (2023). Watson, J. caring science institute. Florida, USA. Available at: https://www.watsoncaringscience.org/jean-bio/caring-science-theory/ (Accessed May 17, 2023).

Weigand, R., and Jacobsen, T. (2021). Beauty and the busy mind: occupied working memory resources impair aesthetic experiences in everyday life. *PLoS One* 16:e0248529. doi: 10.1371/journal.pone.0248529

WikiAves. (2023). Enciclopédia das Aves do Brasil. Available at: http://www.wikiaves.com.br/ (Accessed May 17, 2023).

Zelenski, J. M., and Nisbet, E. K. (2014). Happiness and feeling connected: the distinct role of nature relatedness. *Environ. Behav.* 46, 3–23. doi: 10.1177/0013916512451901

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What makes a school a happy school? Portuguese students' perspectives

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Introduction: UNESCO has sparked interest in the study of happy schools and, through its Happy Schools Project (HSP) framework, provides tools that enable the teaching and learning community to work towards making "happy schools" a reality. Since the understanding of happiness is culturally influenced (HSP studied Asian countries), we sought to identify parallels between the HSP framework and Portuguese schools through the eyes of students.

Methods: We asked a group of Portuguese students to rate their happiness at school and answer three open questions: What makes you happy at school? What makes you unhappy at school? What is a happy school? Using an online survey, 2708 students participated in this study. We coded the answers with variables derived from the HSP framework, aiming to understand what characteristics students value most when referring to their happiness or unhappiness at school and what features a happy school should have.

Results: Findings show that most Portuguese students consider themselves to be reasonably happy. No relevant difference exists between boys' and girls' self-reported happiness levels, and their happiness decreases as age increases. Children emphasized relationships with friends and teachers and teachers' attitudes, competencies, and capacities as elements of a happy school. We found that school unhappiness is related to excessive workload and bullying.

Discussion: Even though there are cultural differences between countries, when we identified the characteristics of a happy school from the perspective of Portuguese students, we found similarities with the HSP framework guidelines.

KEYWORDS

education, students, students' happiness, happy school, happy school framework

1. Introduction

The study of school happiness has gained momentum driven by UNESCO guidelines that foster peace through education and fundamental pillars of learning such as learning to live together and learning to be. These guidelines include qualities based on relationships, including empathy, tolerance, respect for diversity, communication, and teamwork (UNESCO, 2014, 2016).

Indeed, happiness is one of the aspects that the OECD studies consider by analyzing subjective well-being (OECD, 2021), a term associated with happiness (Lyubomirsky et al., 2005; Alexander et al., 2021). Despite this association, it is not agreed upon that the two terms reflect the same thing, as well-being could be interpreted as "a conglomerate of many aspects of life and

one's physical and mental being, while happiness [is] more mental and more fleeting" (Jongbloed and Andres, 2015).

Interest in happiness has increased significantly in the last decade (Dantas, 2018). Its importance led to the World Happiness Report (Helliwell et al., 2012), which described the state of happiness worldwide, the causes of happiness and misery, and the political implications highlighted by case studies. According to the report, happiness differs from society to society, and over time, for identifiable reasons, and can even be alterable through public policies. Concerning adults, professionals' and companies' happiness has been studied (e.g., Dutschke, 2013), with conclusions indicating that the organizational environment influences workers' performance. These studies identified the dimensions and variables contributing to individuals' organizational happiness, informing the design of the Job Design Happiness Scale (Dutschke et al., 2019). This scale makes it possible to identify workers' happiness levels and what makes them happy in the company where they are employed. Because teachers are also workers, the organizational happiness of teachers in Portugal was studied (Gramaxo, 2013), with the conclusions indicating that they are happier in their job than in the organization where they work, and that they are happy because of the students and the way they do their job. They are also happy because they achieve their goals and have autonomy and responsibility, and because they can be creative and enterprising, which are important aspects of organizational happiness. On the other hand, they are unhappy because they do not share the vision of the organization, and because there is no job rotation; having little time to share opinions and make decisions and being underpaid also makes them unhappy, as does the existence of too much bureaucracy. Colleagues can be a cause of happiness, but also of unhappiness (Gramaxo, 2013).

Regarding children, what contributes to their happiness is a set of different dimensions, as found in the literature: health, family, friends, and school (Giacomoni and Hutz, 2008; Holder and Coleman, 2009; Lavalle et al., 2012; Giacomoni et al., 2014; Badri et al., 2018; Mínguez, 2020; Gómez-Baya et al., 2021). When constructing and validating a multidimensional life satisfaction scale for children, Giacomoni and Hutz (2008) found that family, friends, school, and non-violence were dimensions that should be integrated into a scale measuring children's life satisfaction.

Health-protective behaviors such as participation in sports, eating fruit and vegetables, and not smoking were associated with happiness in adolescents (Booker et al., 2014). In line with this finding are those reported by a Portuguese study of adolescents, which found that 25% of happiness is explained by practicing healthy behaviors (sports and good nutrition) (Ferreira, 2018).

Regarding family, the amount of fun they have with their family, how family members get along, and how much time parents spend with their children impacts children's happiness (Badri et al., 2018). Adolescents' perceptions about the involvement and support they receive from their parents are associated with their performance and well-being (OECD, 2017b).

School is also crucial to children's happiness (Giacomoni and Hutz, 2008; Badri et al., 2018; Gómez-Baya et al., 2021). Children are happy at school because of their classroom colleagues, the things they learn, and their relationships with teachers; inversely, bullying is significantly negatively associated with happiness at school (Aunampai et al., 2022). Positive (or unfavorable) social interactions with friends explain variance in children's happiness (Holder and Coleman, 2009; O'Rourke and Cooper, 2010; Ince et al., 2022). Children spend most of their time at school; therefore, studying what makes children happy at school and what makes a school happy is relevant to inform policy and practice.

The individual gains of education are transposed into better and better-paid jobs, work, skills valuation, personal independence and social relations, reduced risk of unemployment, and increased well-being. Learning acquired at school also generate better decisions on a health level, encourage civic participation, and reduce the probability of developing risky or delinquent behaviors (Oreopoulos and Salvanes, 2011).

Schooling is vital because it prepares students for life both in the labor market and at a personal level; those who spend more years in school tend to be happier than those who spend less time there (Veenhoven, 2012). A synergy exists between happiness and learning (Seligman et al., 2009). Happy students achieve more (Gilman and Huebner, 2006; OECD, 2017a; Ferreira, 2018), so happiness should be one of the goals of education, and a good education should contribute significantly to personal and collective happiness (Noddings, 2003).

1.1. Studying happiness at the school level

The school became an object of study despite a trend of study advocating "schools do not matter" (Coleman et al., 1966), which assigned successful learning to the socioeconomic context. We follow the trend clarifying that "school makes a difference" (Bolívar, 2012). But how? From the seventies onwards, several researchers aimed to study "school effectiveness." The characteristics of an "effective school" started to be analyzed to investigate the school-related facts that directly or indirectly explain students' results (Bolívar, 2012). To sum up the main conclusions of what contributes to an effective school, the research uncovered: strong leadership, an orderly and conducive environment for learning, an emphasis and focus on learning, high expectations for students, student performance monitoring, student success valuing, shared goals and values, and parent involvement (Gaziel, 1997; Engels et al., 2008; Dumay, 2009). Socioeconomic background and family structure have also been identified as determinants of successful learning (Björklund and Salvanes, 2010; Parey et al., 2013).

Another perspective is anchored in "school climate," which identifies the social, emotional, ethical, academic, and environmental dimensions of school life (Cohen and Michelli, 2009). This area of study underlines the importance of affective and cognitive perceptions regarding social interactions, relationships, values, and beliefs held by students, teachers, administrators, and staff within a school (Rudasill et al., 2018), while concurrently guaranteeing safety in a social and physical sense (Zullig et al., 2010). This school climate approach is associated with happy schools (Talebzadeh and Samkan, 2011; Huebner et al., 2014).

We stand before a critical paradigm driven by UNESCO's study of a happy school (UNESCO, 2016). Creating school rankings from a simplistic analysis of best or worst results is an ineffective way to analyze education. Instead, we should add more complex layers from the understanding of happiness characterized by how each individual feels at school, and how school organizations can improve individual happiness levels. The decision maker should focus on more than pressure, academic results, tests, and competition. Areas such as the joy in learning, friendships and relationships, a sense of belonging,

and recognizing the relevance of values should be strengthened, as they help enhance happiness and well-being.

Regarding children's perspectives, López-Pérez and Fernández-Castilla (2018) found that from children's point of view, happiness at school means having free time, helping and being helped in their difficulties, being with their friends, and being praised. López-Pérez et al. (2022) compared English and Spanish pupils' views on happiness at school and found that English children defined happiness at school as experiencing autonomy, non-violence, and having a positive relationship with teachers, while Spanish children privileged harmony and having leisure time. Finally, compared to boys, girls mentioned emotional support, positive relationships with teachers, and experiencing competence more frequently in their definitions of happiness.

For children to feel happy at school, they must spend time with their friends, have fun, have self-esteem, and feel safe. On the other hand, tiredness, confusion, nervousness (Mertoğlu, 2020), and bullying contribute to their unhappiness (Calp, 2020; Mínguez, 2020; Aunampai et al., 2022).

1.2. A happy school

All students appreciate a school environment where bullying is rare, making friends is relatively easy, and establishing genuine and respectful relationships with teachers is the norm (OECD, 2019). A happy school is one where management, teachers, and students are open to innovation; students learn content necessary for life, and acquire self-related skills; students highly value teachers because they are knowledgeable, attentive, helpful, sufficiently demanding, and able to explain their subject well (Kuurme and Heinla, 2020). A happy school is also a school where students, teachers, administrators, and staff feel happy (Calp, 2020), and one that offers students a happy learning environment, enabling them to feel happy and excited about going to school and learning from their teachers (Giản et al., 2021).

Other variables associated with a happy school are: praising students for their success and progress; active teaching methods; group thinking and work; teacher happiness and interaction with students; course content; training facilities; and school organizational climate (Talebzadeh and Samkan, 2011). By promoting a favorable climate, schools can ensure more equality in educational opportunities, diminish socioeconomic inequalities, and enable social mobility (Berkowitz et al., 2017). Understanding what makes children happy at school might be relevant to achieving Sustainable Development Goal 4 - Quality of Education as defined by the United Nations Resolution 2022. This goal aims to ensure inclusive and equitable quality education, and promote lifelong opportunities for all. However, there are gaps in terms of what socioeconomic background is concerned; therefore, to improve the performance of all students, countries must become high-performers and achieve SDG 4 and its targets (OECD, 2017a).

1.3. Happy school framework

The goal of a happy school is to improve learning experiences. Seeking to achieve this goal, UNESCO (2016) conducted a study named the Happy School Project (HSP). The authors reviewed the literature on happiness and well-being and gathered data through an online survey of students attending private and public schools and adults with responsibilities or who work in those schools: students, teachers, school support staff, parents, the general public, and school principals. The findings allowed for the design of a framework that considers three dimensions contributing to a happy school: people (referring to social relationships), process (referring to teaching and learning methods), and place (referring to contextual factors).

According to the project, these dimensions rely on 22 variables (Table 1).

These findings are consistent with those of other studies: one claims that the dimensions contributing to a happy school are (1) individual, (2) social/emotional (people), (3) instructional (process), and (4) physical (place) (Talebzadeh and Samkan, 2011). Another revealed that the dimensions contributing to school environment are (1) quality of interactions with teachers and peers (people), (2) instructional practices in the classroom and students' perceived and actual academic performance, as well as opportunities to participate in extracurricular activities (process), (3) students' perceptions of safety (place), and (4) parental involvement in schooling (Huebner et al., 2014). Another study, conducted by the Philippines Department of Education in 2021 (integrated into the national project Happy Schools Movement), focused on three interrelated dimensions: (1) relationship, (2) teaching-learning experiences, and (3) physical environment and atmosphere, similar to the HSP framework. We can conclude that aspects such as the relationships between people, the

TABLE 1 Dimensions and variables of the HSP framework.

People	Process	Place
1. Friendship and relationships in the school community	7. Reasonable and fair workload	16. Warm and friendly learning environment
2. Positive teacher attitudes and attributes	8. Teamwork and collaborative spirit	17. Secure environment free from bullying
3. Respect for diversity and differences	9. Fun and engaging teaching and learning approaches	18. Open and green learning and playing spaces
4. Positive and collaborative values and practices	10. Learner freedom, creativity, and engagement	19. School vision and leadership
5. Teacher working conditions and well-being	11. Sense of achievement and accomplishment	20. Positive discipline
6. Teacher skills and competencies	12. Extracurricular activities and school events	21. Good health, sanitation, and nutrition
	13. Learning as a team between students and teachers	22. Democratic school management
	14. Useful, relevant, and engaging learning content	
	15. Mental well-being and stress-management	

processes through which teaching/learning takes place, and the spaces where learning takes place together, are the basis of a happy school.

1.4. An unhappy school

The HSP framework study (UNESCO, 2016) clarifies what makes students unhappy at school: (1) an unsafe environment prone to bullying, (2) high student workload and stress provoked by exams and grades, (3) a hostile environment and school atmosphere, (4) negative teacher attitudes and attributes, and (5) bad relationships.

Characterizing the variables associated with happy and unhappy schools informs policymakers about measures to be implemented or avoided to reduce unhappiness and adverse feelings.

1.5. Objectives

HSP was developed mainly in Asian countries, which are culturally very different from the Portuguese reality. There can be cultural differences involved in determining what is valued for a happy school. Our global objective is to understand the concept of a happy school from the Portuguese students' perspective. We have already studied the concept from the parents' perspective (Gramaxo et al., 2023). Our goal with this present study was to uncover Portuguese students´ perspectives concerning a happy school. The following research questions were investigated:

1. What is the level of happiness at school reported by students? Are there differences according to age and gender?
2. What makes Portuguese students happy at school?
3. What makes Portuguese students unhappy at school?
4. What are the characteristics of a happy school from the perspective of Portuguese students?

2. Materials and methods

We have conducted a descriptive and correlational exploratory study, given the absence of previous studies about happy schools in Portugal. We have first proceeded with a qualitative approach through content analysis of the questionnaires, aiming to categorize and quantify the concepts and items identified. Then, with the finding data, we proceeded with a quantitative analysis. The questionnaire was first sent to school directors for their approval. After that, the questionnaire was formally disseminated by the school, involving the directors, teachers, and parents. Parents and students were informed about the study's objectives and that data would be used only for research purposes. Their collaboration was voluntary, and they could drop out of the study at any time. The questionnaires were anonymous. Ethical concerns were, therefore, present in the research process (AERA 2011). Ethical and methodological review and authorization to apply this questionnaire in the school context were obtained from the Portuguese General Directorate of Education (protocol number 0694400004) and the Ethics Committee of the Laboratory of Distance Learning and eLearning (CE-Doc. 23–03).

We collected 2,858 responses. Among these, 2,708 responses were validated (94,7%), while 150 participants were excluded from the research because their forms were incomplete. In the study reported in this paper, the sample consisted of 2,708 Portuguese students (1,460 girls and 1,248 boys), aged between 6 and 20 years old, attending 32 public schools concentrated in the central region of Portugal, but representing a variety of contexts. All the students were enrolled in mandatory education.

We have segmented the students' ages into clusters, corresponding to the expected ages for each of the cycles and levels of education: 6–10 (First Cycle of Basic Education), 11–12 (Second Cycle of Basic Education), 13–15 (Third Cycle of Basic Education), and 16-above (Secondary Education). The resulting characterization of the participants, according to their age and gender, is presented in Table 2.

Students were asked to rate their happiness at school on a Likert scale from 1 (very unhappy) to 5 (very happy). They also answered three open questions: (a) What makes you happy at school? (b) What makes you unhappy at school? (c) What are the characteristics of a happy school? The questionnaire was filled out online and is presented in Appendix A.

The resulting data were primarily qualitative. For the answers on happiness (personal and school level), an *a priori* category scheme was constructed based on the 22 variables of the HSP framework (Mayring, 2014; UNESCO, 2016; Gizzi and Rädiker, 2021). The response regarding what makes students unhappy was coded according to five variables: Too many classes, Bullying, Negative attitudes from teachers, Bad learning environment, and Bad relations with peers or teachers, which are negative counterparts of some of the variables directly derived from the HSF. The 2,708 responses were coded using MaxQda 11.2.5 (software for qualitative data analysis in academic research) (Kuckartz and Rädiker, 2019). The responses were coded through keywords/expressions, and a nominal scale was used to quantify the variables (0 = not evident or not valued in the answer;

TABLE 2 Participants' characterization.

		Sex					
		Female			Male		
		Mean	%	Count	Mean	%	Count
Age		13,5	53,9		13,4	46,1	
Age Clusters	6 to 10		8,6	233		7,5	203
	11 to 12		10,7	289		8,7	236
	13 to 15		19,4	526		17,5	475
	16 to 20		15,2	412		12,3	334

1 = valued in the answer). The research team was involved in the creation of the coding grid and the data codification. This analysis was used to validate (or not) the 22 variables of the HSP framework (UNESCO, 2016) as they apply to Portuguese students (see Table 3).

The resulting quantitative data were analyzed through descriptive and inferential statistics, including hypothesis testing (*t*-tests, ANOVA, Sheffé test, Cohen's d. Effect size was calculated by partial eta squared [ηp2], considering 0.02 as a small effect, 0.13 as a medium effect, and 0.26 as a large effect). Data were analyzed using IBM SPSS v.29.

3. Results

3.1. Portuguese students' level of happiness at school

The global happiness level in our sample is 3,67 (0,95), showing that the students are moderately happy. The mode of happiness is four (4), with 12% of students declaring level one (very unhappy) and two (unhappy). In total, 88% of students are on the positive spectrum, with 41% declaring level 4. Differences between the age clusters proved to be significant, with a medium effect size ($F = 172.15$, $p < 0.001$, $\eta p2 = 0.16$). A posthoc Sheffé test revealed significant differences among all four age groups considered ($p < 0.001$).

Age differences are evident, as the students declare themselves unhappier as they grow older. Six- and seven-year-olds report being very happy at school, while 16-year-olds and above report only slightly above 3.

No significant differences between female and male students were found ($t = -88$, $p > 0.05$) (see Figure 1).

3.2. What makes Portuguese students happy at school?

When we asked "What makes you happy in school" as an open question and then codified the answers against the HSP framework's 3 dimensions and 22 variables (Table 4), the pattern that emerged was obvious: The dimension "people" was referred to by 83.8% of students, with a relevant emphasis on friendship, and relationship with peers, clearly the most important aspect for students feeling happy at school (80.4%), as can be seen in Table 4. There is an association between feeling happier and reporting friends as an aspect of feeling happy at school ($t = 5.53$, $p < 0.001$, Cohen's $d = 0.294$). The t-test shows a significant difference with a small effect size. We remark, however, that the importance attributed to friends seems to decrease as age increases (as determined by an ANOVA: $F = 5.5$, $p < 0.001$, $\eta p2 = 0.001$), although the effect size is small.

Teachers emerge as the second most crucial variable in the "people" dimension, with attitudes being referred to by 15% of students, and 13% referring to their competencies and teaching capacities. Relations with teachers are also significantly correlated with the self-reported level of happiness ($t = 8.55$, $p < 0.001$, Cohen's

TABLE 3 Description of the variables' scheme applied to questions 1 and 3

Dimensions	Variables	Examples
People	1. Friendship and relationships in the school community	Being with my friends.
	2. Positive teacher attitudes and attributes	Teachers who help me learn about the planet.
	3. Respect for diversity and differences	Sensitivity about personal differences.
	4. Positive and collaborative values and practices	The collaborative environment.
	5. Teacher working conditions and well-being	Teachers' happiness.
	6. Teacher skills and competencies	Having good teachers who help me to learn well.
Process	7. Reasonable and fair workload	Having free afternoons.
	8. Teamwork and collaborative spirit	The sharing environment between students and teachers.
	9. Fun and engaging teaching and learning approaches	Practical classes, such as Physical Education classes.
	10. Learner freedom, creativity, and engagement	Activities that promote our autonomy. Activities where we can express our feelings.
	11. Sense of achievement and accomplishment	Understanding that my efforts were worth it because I got good grades.
	12. Extracurricular activities and school events	Sports.
	13. Learning as a team between students and teachers	The sharing environment between students and teachers.
	14. Useful, relevant, and engaging learning content	Learning to read and write. I love doing maths!
	15. Mental well-being and stress-management	This school is welcoming and differentiates learning.
Place	16. Warm and friendly learning environment	Good learning environment.
	17. Secure environment free from bullying	It's a safe school where we can trust the teachers.
	18. Open and green learning and playing spaces	My school has green spaces and several areas where we can play.
	19. School vision and leadership	Organized school.
	20. Positive discipline	None of the students' answers were categorized as such.
	21. Good health, sanitation, and nutrition	Eating my soup.
	22. Democratic school management	None of the students' answers were categorized as such.

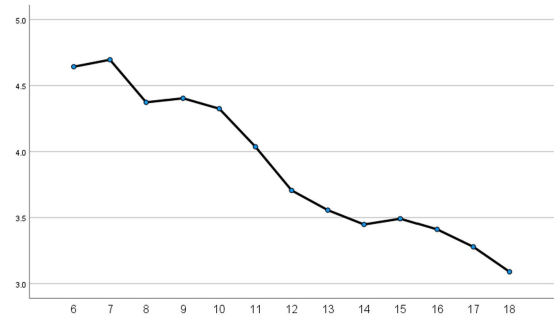

FIGURE 1
Happiness average per student's age.

d = 0.41) as well as teacher competence ($t = -7.34$, $p < 0.001$, Cohen's $d = 0.42$).

The "process" dimension was referred to by 21.9% of students with particular highlights of the learning process: creativity (7.2%) and fun learning activities (6.0%), as well as relevant content (6.6%). All the other variables were seldom referred to, or not referred to at all.

Finally, "places" was referred to by 7.6% of students, particularly with regard to the quality of outdoor spaces and health and nutrition.

Age has a significant impact on the dimension "people" (ANOVA, $F = 15.12$, $p < 0.001$, $\eta p2 = 0.02$) with a decreasing level of importance, and "process" (ANOVA, $F = 30.98$, $p < 0.001$, $\eta p2 = 0.03$) as younger respondents, in the first three cohorts, value this aspect more than secondary-age students.

3.3. What makes Portuguese students unhappy at school?

When students were asked about what makes them unhappy, their responses highlighted excessive workload (24.9%) and bullying (21.7%) as the primary sources of discomfort at school (Table 5).

Four of these five variables show significant differences with age group: bullying ($F = 74.67$, $p < 0.001$, $\eta p2 = 0.08$), workload ($F = 39.09$, $p < 0.001$, $\eta p2 = 0.04$), classroom environment ($F = 5.77$, $p < 0.001$, $\eta p2 = 0.01$), and teachers' attitudes ($F = 9.92$, $p < 0.001$, $\eta p2 = 0.01$), with the most relevant impacts pointing to a decrease in bullying with age, and an increase in concern with the workload.

In total, 50.5% of students mentioned at least one aspect that contributed to their unhappiness.

Mentioning bullying as something that makes them unhappy negatively affects the overall happiness reported ($t = 5.35$, $p < 0.001$, Cohen's $d = 0.25$). Being concerned about an excessive workload ($t = -5.33$, $p < 0.001$, Cohen's $d = -0.24$) and teachers with negative attributes ($t = -2.22$, $p < 0.05$, Cohen's $d = -0.16$), on the other hand, seem to go hand in hand with higher levels of overall happiness.

3.4. What are the characteristics of a happy school?

62.3% of the surveyed students referred to "people," with friends taking the lead (55.4%), followed by teachers concerning both their relation capability (16.1%) and competence (15.0%).

"Process" is equally valued at the school level (21.9%) and the individual level, with particular emphasis on fun teaching approaches (10.3%), fair workload (9.6%), creativity (6.4%), and extracurricular activities (5.6%). At the school level, 4.2% of students also refer to a school that is concerned with stress-management.

Finally, 16.2% of students referred to the context level ("place"), highlighting food and health concerns (8.6%) and outdoor spaces (4.5%). These results, depicted in Table 6 and particularly in Figure 2, highlight the similarities between their appraisal of what contributes to their personal happiness, and what constitutes a happy school.

Age showed significant effects ($p < 0.001$) on how much the students valued some of these variables, including friendships (ANOVA, $F = 8.67$, $p < 0.001$, $\eta p2 = 0.01$), teacher attitudes and attributes (ANOVA, $F = 15.77$, $p < 0.001$, $\eta p2 = 0.02$), collaborative practices (ANOVA, $F = 7.64$, $p < 0.001$, $\eta p2 = 0.01$), teachers' skills (ANOVA, $F = 17.59$, $p < 0.001$, $\eta p2 = 0.02$), learning as a team (ANOVA, $F = 2.02$, $p < 0.001$, $\eta p2 = 0.002$), extracurricular activities (ANOVA, $F = 2.02$, $p < 0.001$, $\eta p2 = 0.01$), mental well-being (ANOVA, $F = 8.80$, $p < 0.001$, $\eta p2 = 0.01$), open and green spaces (ANOVA, $F = 9.83$, $p < 0.001$, $\eta p2 = 0.01$), and health and nutrition (ANOVA, $F = 5.59$, $p < 0.001$, $\eta p2 = 0.01$), although with small effect sizes.

4. Discussion

One of the goals of our study was to identify students´ happiness levels at school. We found that the students in our sample were moderately happy, although happiness decreases with age. This finding aligns with others' (Giacomoni and Hutz, 2008; Huebner et al., 2014; Uusitalo-Malmivaara, 2014; Badri et al., 2018; Mertoğlu, 2020). We found no differences between the levels of happiness reported by girls and boys, which others pointed out (Gómez-Baya et al., 2021). For our population, happiness at school is independent of gender.

We organized data analysis by a category scheme based on the framework established by the HSP framework (UNESCO, 2016). We found that not all the variables that the HSP identifies as characteristics of a happy school are valued by Portuguese students.

4.1. People

Our findings show that friendships and relationships in the school community are the most fundamental reason for students to feel happy in school, which is consistent with other studies claiming the central importance of interpersonal relationships in school in determining the subjective well-being of students (Huebner et al., 2014; Mertoğlu, 2020; Gómez-Baya et al., 2021). Our findings are closer to Díaz (2019), which found that variables making children happy at school are mainly friends and classmates, activities that include games and recreation, learning (specifically when it does not involve feelings of frustration), and achievement and good performance. A happy school is where students have friends, fun and engaging activities, learning opportunities, achievement and good performance, largely because of teachers´ characteristics.

Portuguese students valued having teachers with positive attitudes and attributes. Having this kind of teachers makes students happy because they directly affect the way students learn, what they learn, and the way they interact with each other (Badri et al., 2018; Stronge,

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TABLE 4 What makes students happy at school.

		Age									
		6 to 10		11 to 12		13 to 15		16 to 20		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
PEOPLE	Friendships and relationships in the school community	364	83.5	428	81.5	822	82.1	563	75.5	2,177	80.4
	Positive teacher attitudes and attributes	103	23.6	91	17.3	119	11.9	91	12.2	404	14.9
	Respect for diversity and differences	0	0.0	1	0.2	4	0.4	4	0.5	9	0.3
	Positive and collaborative values and practices	0	0.0	0	0.0	0	0.0	1	0.1	1	0.0
	Teacher conditions and well-being	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0
	Teacher skills and competencies	91	20.9	85	16.2	99	9.9	79	10.6	354	13.1
PROCESS	Reasonable and fair workload	2	0.5	14	2.7	11	1.1	13	1.7	40	1.5
	Teamwork and collaborative spirit	1	0.2	3	0.6	6	0.6	0	0.0	10	0.4
	Fun and engaging teaching and learning approaches	27	6.2	28	5.3	54	5.4	53	7.1	162	6.0
	Learner freedom, creativity, and engagement	114	26.1	30	5.7	32	3.2	20	2.7	196	7.2
	Sense of achievement and accomplishment	3	0.7	2	0.4	7	0.7	5	0.7	17	0.6
	Extracurricular activities and school events	7	1.6	5	1.0	18	1.8	17	2.3	47	1.7
	Learning as a team between students and teachers	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0
	Useful, relevant, and engaging learning content	35	8.0	41	7.8	64	6.4	36	4.8	176	6.5
	Mental well-being and stress-management	1	0.2	0	0.0	0	0.0	0	0.0	1	0.0
PLACE	Warm and friendly learning environment	0	0.0	2	0.4	11	1.1	19	2.5	32	1.2
	Secure environment free from bullying	3	0.7	3	0.6	5	0.5	3	0.4	14	0.5
	Open and green learning and playing spaces	8	1.8	21	4.0	27	2.7	11	1.5	67	2.5
	School vision and leadership	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Positive discipline	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Good health, sanitation, and nutrition	15	3.4	30	5.7	36	3.6	22	2.9	103	3.8
	Democratic school management	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

2018; OECD, 2019; Calp, 2020; Gómez-Baya et al., 2021). Having teachers who listen to them and are fair makes them happier, which has also been pointed out as a relevant aspect of happy schools (Mínguez, 2020). This has direct implications for teacher training and lifelong learning, preparing them to promote the inclusion of all students (Inês et al., 2022) and ensuring supervision processes that contribute to reflection about their practices and collaboration among teachers directed to pedagogical improvement (Foong et al., 2018; Wright et al., 2019; Seabra et al., 2021). To be a happy school is to ensure there are teachers like this teaching at school.

TABLE 5 What makes students unhappy at school.

	Age									
	6 to 10		11 to 12		13 to 15		16 to 20		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Environment prone to bullying	200	45.9	131	25.0	164	16.4	93	12.5	588	21.7
Excessive workload and stress due to evaluation	34	7.8	113	21.5	266	26.6	260	34.9	673	24.9
School and classroom environments unsuitable for learning	4	0.9	8	1.5	1	0.1	1	0.1	14	0.5
Teachers with negative attributes or attitudes	60	13.8	29	5.5	88	8.8	43	5.8	220	8.1
Bad relationships with teachers or peers	0	0.0	1	0.2	2	0.2	1	0.1	4	0.1

In our study, the variable of respect for diversity and difference was rarely pointed out; this might be due to the low "diversity" of students in schools, or the fact that the children consider their friends as equals and do not identify "differences" in them. Nevertheless, this is somewhat contradictory because students responded that bullying is the leading cause of unhappiness at school, i.e., diversity and difference are not fully respected because there are cases of bullying at school (Calp, 2020; Aunampai et al., 2022).

The respondents identified positive and collaborative values and practices as relevant, although infrequently. Therefore, the results of this study do not fully support the results reported by the HSP and others (Talebzadeh and Samkan, 2011). The students' discourse also failed to identify a concern for teachers' working conditions and well-being; teacher happiness influences their interactions with students (Talebzadeh and Samkan, 2011). These aspects are essential in combating teacher burnout (Capone et al., 2019). However, it appears that the students are unaware of variables relating more directly to teachers. Future studies considering teachers' perspectives might further illuminate this aspect. Just as the HSP values teacher skills and competencies, so do the respondents in this study: teachers' characteristics impact the teaching process (Talebzadeh and Samkan, 2011). Parents agree corroborate this feeling (Feraco et al., 2023).

4.2. Process

Students did not value a reasonable and fair workload, which could mean that it does not make them happy at school. However, it could also mean that they have an unfair workload and that this aspect would be necessary for their happiness in school, which would match the findings of the HSP framework (UNESCO, 2016). Further research into this dimension, potentially including in-depth interviews, is necessary to discriminate between these possibilities.

Also, teamwork and collaborative spirit were not highly valued, although group activities with colleagues contribute to students´ happiness (Lee and Yoo, 2014). This might mean that working in a group or collaboratively in Portuguese schools is not common.

Learning through fun and engaging teaching and learning approaches makes students feel happy in school, which agrees with the findings of HSP (UNESCO, 2016). Students assigned importance to learning freedom, creativity, and engagement – one of the characteristics of a happy school found in other studies (Soleimani and Tebyanian, 2011). This means that, for the youngest, a happy school encourages students to engage in interesting teaching practices, and also allows them to be creative.

The HSP pointed out that one of the variables contributing to a happy school is having a sense of achievement and accomplishment, which matches others´ findings (Talebzadeh and Samkan, 2011); our study confirms this variable, although in a tenuous way. This may mean that, although Portuguese legislation allows for the recognition of students, not all schools do so.

The existence of extracurricular activities and school events is reported as being relevant for students to feel happy at school (Huebner et al., 2014), in line with parents 'perspectives (Feraco et al., 2023; Gramaxo et al., 2023). Participating in extracurricular activities relates to students´ life satisfaction (Feraco et al., 2023) and it's a characteristic of a happy school (UNESCO, 2016). In Portugal, schools attended by students up to the age of 12 often have extracurricular activities.

Portuguese students did not consider learning as a team between students and teachers essential to feeling happy at school. Although it was not valued by the respondents of this study, the HSP points out that learning as a team between students and teachers is a variable that contributes to a happy school (UNESCO, 2016). This may mean that it is not usual for Portuguese students to work together with their teachers.

The current study found that useful, relevant, and engaging learning content is important for happiness in school; students feel happy with what they learn (Gómez-Baya et al., 2021), which draws attention to curricular issues involved in promoting happy schools (Pacheco and Seabra, 2013). Portuguese students say that what they learn at school should be useful in their daily lives.

The respondents did not refer to mental well-being and stress-management in relevant numbers, although the HSP values this dimension (UNESCO, 2016). We might think that students do not realize the difficulties that teachers might have in terms of stress and well-being.

4.3. Place

A warm and friendly learning environment was reported as necessary for students to feel happy at school, consistent with those who argue that students with better results on standard tests attend

TABLE 6 What makes a school a happy school.

		Age									
		6 to 10		11 to 12		13 to 15		16 to 20		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
PEOPLE	Friendships and relationships in the school community	276	63.3	318	60.6	527	52.6	380	509	1,501	55.4
	Positive teacher attitudes and attributes	64	14.7	130	24.8	164	16.4	79	10.6	437	16.1
	Respect for diversity and differences	8	1.8	2	0.4	11	1.1	9	1.2	30	1.1
	Positive and collaborative values and practices	3	0.7	6	1.1	19	1.9	32	4.3	60	2.2
	Teacher conditions and well-being	0	0.0	0	0.0	0	0.0	1	0.1	1	0.0
	Teacher skills and competencies	43	9.9	124	23.6	161	16.1	79	10.6	407	15.0
PROCESS	Reasonable and fair workload	28	6.4	40	7.6	111	11.1	82	11.0	261	9.6
	Teamwork and collaborative spirit	0	0.0	10	1.9	11	1.1	4	0.5	25	0.9
	Fun and Engaging teaching and learning approaches	30	6.9	52	9.9	115	11.5	83	11.1	280	10.3
	Learner freedom, creativity, and engagement	37	8.5	24	4.6	62	6.2	49	6.6	172	6.4
	Sense of achievement and accomplishment	2	0.5	3	0.6	3	0.3	6	0.8	14	0.5
	Extracurricular activities and school events	6	1.4	23	4.4	66	6.6	58	7.8	153	5.6
	Learning as a team between students and teachers	0	0.0	1	0.2	3	0.3	6	0.8	10	0.4
	Useful, relevant, and engaging learning content	13	3.0	3	0.6	14	1.4	25	3.4	55	2.0
	Mental well-being and stress-management	2	0.5	17	3.2	47	4.7	48	6.4	114	4.2
PLACE	Warm and friendly learning environment	2	0.5	9	1.7	18	1.8	5	0.7	34	1.3
	Secure environment free from bullying	5	1.1	8	1.5	24	2.4	10	1.3	47	1.7
	Open and green learning and playing spaces	40	9.2	21	4.0	28	2.8	33	4.4	122	4.5
	School vision and leadership	1	0.2	10	1.9	25	2.5	19	2.5	55	2.0
	Positive discipline	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Good health, sanitation, and nutrition	25	5.7	53	10.1	107	10.7	47	6.3	232	8.6
	Democratic school management	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

schools with a learning-friendly environment (Leithwood and Jantzi, 2006; Macneil et al., 2009; UNESCO, 2021). A happy school has an orderly environment, conducive to learning.

Our study has identified a weak appreciation of a secure environment free from bullying, although it is considered necessary when we analyze a happy school (Huebner et al., 2014; Calp, 2020; Mertoğlu, 2020). Children are more likely to reach their social, emotional, and academic potential in a safe, supportive, and collaborative school environment (OECD, 2019). Children who perceive their school environment as safe and supportive are likelier

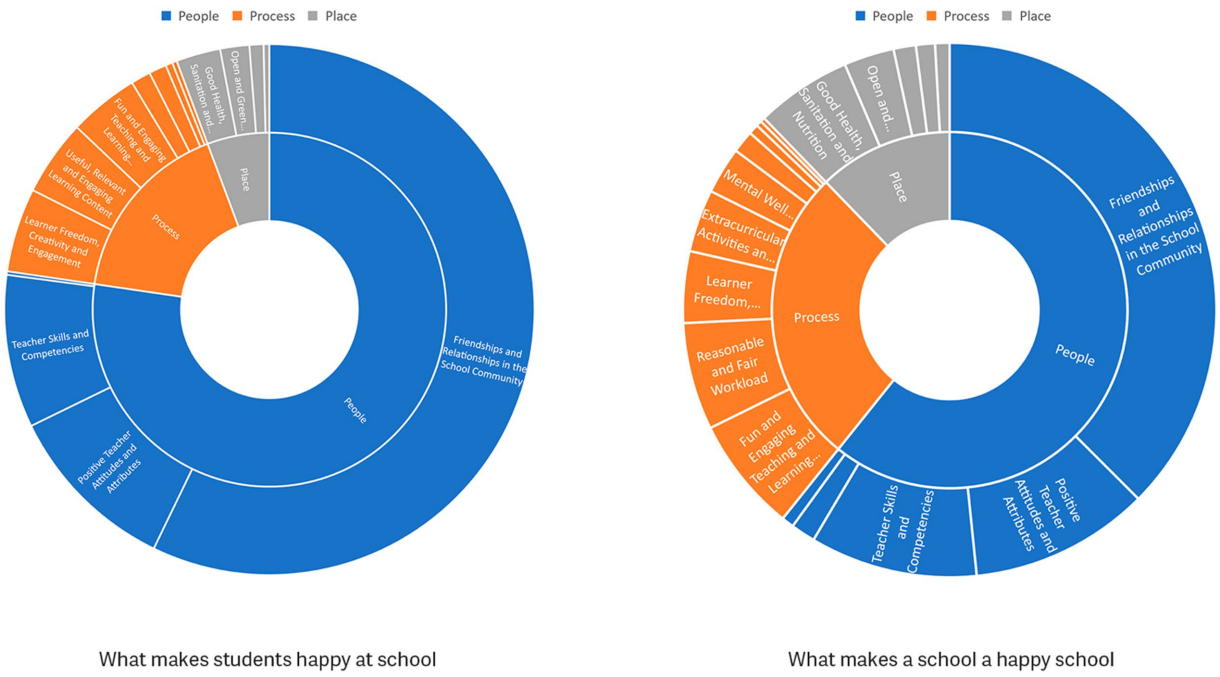

FIGURE 2
Comparison between factors identified as contributing to personal happiness vs. happiness at the school level, % of answers per category.

to achieve expected academic and social outcomes (Huebner et al., 2014). This can mean that respondents know that, in a happy school, there's no room for bullying, and a happy school is a safe place.

Our respondents valued the existence of open and green learning and playing spaces, consistent with the HSP and others, who claimed that, during the pandemic, the fact of having or not having an outside area was noted (Quay et al., 2020). Physical space is essential, and in a dream school, it should be large (Ince et al., 2022). In a happy school, students learn outdoors, making the playground and nature their classroom.

Despite being less valued by the students in our sample, school vision and leadership is a variable that contributes to a happy school from the HSP perspective (UNESCO, 2016). School vision and leadership promote good learning conditions (Leithwood and Jantzi, 2006; Dumay, 2009; Heck and Hallinger, 2010; Bolívar, 2012); hopefully, this variable will emerge with a bolder emphasis when the teachers´ opinion is taken into account.

Our respondents do not refer to positive discipline, despite the HSP considering this a variable contributing to a happy school; it could mean that Portuguese students are used to a more traditional form of discipline.

Respondents consider good health, sanitation, and nutrition relevant, in line with the HSP (UNESCO, 2016). For them, a happy school has good food and clean areas. Students do not value the existence of democratic school management, unlike the HSP (UNESCO, 2016). This can mean that Portuguese school do not involve students in school management decisions.

5. Conclusion

We can conclude that most children in the sampled Portuguese public schools feel at least moderately happy at school, although the level of happiness at school decreases with age, and some children report feeling unhappy or very unhappy, stressing the need for adequate intervention to help schools effectively be happy for all students.

The main results of our analysis, which involved 2,708 students from different educational levels, show that happiness is linked to friends and people, with students amply referring to this dimension. Happiness positively correlates to creativity, friends, learning strategies, and teachers' attitudes, competencies, and capacities. These findings are in line with parents' perspectives (Gramaxo et al., 2023), which reinforces our conclusions. On the other hand, negative attitudes from teachers or bullying can put happiness at risk. When students refer to unhappiness, they also state that "people" are what can make them unhappy through bullying. A relevant aspect that was referred to was the excessive number of classes, which keeps children inside a classroom for long hours.

In summary, we found parallels between HSP and Portuguese students on what a happy school should look like. We have not validated "Teacher Conditions and Well-Being", which means we validated 5 out of 6 variables in the "people" dimension: (1) Friendships and Relationships in the School Community; (2) Teacher Skills and Competencies; (3) Positive Teacher Attitudes and Attributes; (4) Respect for Diversity and Differences; (5) Positive and Collaborative Values and Practices.

We have validated 9 out of 9 variables in the "process" dimension. We have also validated 5 out of 7 variables in the "place" dimension: (1) Good Health, Sanitation, and Nutrition; (2) Open and Green Learning and Playing Spaces; (3) School Vision and Leadership; (4) Secure Environment Free from Bullying; (5) Warm and Friendly Learning Environment. In this dimension, we have not validated "Positive Discipline" and "Democratic School Management."

When we build the bridge between the individual and the institutions, i.e., schools, we realize that "people" is the most relevant

aspect on both levels. However, when answering the question of "what makes a happy school," students were more pragmatic. They focused on the external elements susceptible to policymakers' intervention: better teaching strategies, more organized timetables, and creative and extracurricular activities. Context-level variables such as food and outdoor spaces were also referred to at the school level. These aspects should, therefore, be priority targets of policymakers' and practitioners' efforts for school improvement.

Our study has some limitations. We acknowledge that the fact that we have studied a non-probabilistic sample limits the possibility of generalizing the results to the national population. Therefore, our conclusions apply only to the studied sample.

Despite these limitations, this study was pioneering in addressing the happy schools construct in Portugal. We gathered data from students of all levels of mandatory education and multiple regional contexts, representing a variety of student realities. Also, despite collecting data from a large number of participants, we gathered qualitative data in children's own words, which allowed us to develop a more naturalistic and unprompted understanding of what children value in their school experience. The framework was built upon a study conducted in a very different cultural reality, impacting how aspects of happy schools are valued (Stearns, 2019). Therefore, assessing what features are relevant to Portuguese children and youth is valuable.

This study obtained original knowledge to understand the happiness dimension of the Portuguese student population, while providing clues on how to foster happier schools and avoid unhappiness.

Further research is needed, questioning teachers, school staff, and principals. Only by considering the perspectives of all those involved will we fully understand happiness at school and clearly define which HSP (UNESCO, 2016) variables are relevant to the Portuguese reality.

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 study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of the LE@D, Open University (CE-Doc. 23–03), and the General Directorate of Education (Portugal), under the number 0694400004. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

PG: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. IF: Data curation, Formal analysis, Methodology, Software, Visualization, Writing – original draft, Writing – review & editing. GD: Conceptualization, Validation, Visualization, Writing – original draft, Writing – review & editing. FS: Data curation, Formal analysis, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing.

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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.

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References

Alexander, R., Aragón, O. R., Bookwala, J., Cherbuin, N., Gatt, J. M., Kahrilas, I. J., et al. (2021). The neuroscience of positive emotions and affect: implications for cultivating happiness and wellbeing. *Neurosci. Biobehav. Rev.* 121, 220–249. doi: 10.1016/J.Neubiorev.2020.12.002

Aunampai, A., Widyastari, D. A., Chuanwan, S., and Katewongsa, P. (2022). Association of bullying on happiness at school: evidence from Thailand's National School-Based Survey. *Int. J. Adolesc. Youth* 27, 72–84. doi: 10.1080/02673843.2021.2025117

Badri, M., Al Nuaimi, A., Guang, Y., Al Sheryani, Y., and Al Rashedi, A. (2018). The effects of home And school on Children's happiness: a structural equation model. *Int. J. Child Care Educ. Policy* 12:17. doi: 10.1186/S40723-018-0056-Z

Berkowitz, R., Moore, H., Astor, R., and Benbenishty, R. (2017). A research synthesis of the associations between socioeconomic background, inequality, school climate, And academic achievement. *Rev. Educ. Res.* 87, 425–469. doi: 10.3102/0034654316669821

Björklund, A., and Salvanes, K. (2010). "Education And family background: mechanisms and policies" in *Handbook of the economics of education*. eds. E. A. Hanushek, S. Machin and L. Woessmann (The Netherlands: Elsevier), 201–247.

Bolívar, A. (2012). *Melhorar Os Processos E Os Resultados Educativos: O Que Nos Ensina A Investigação*. Translated By Mónica Franco. Vila Nova De Gaia: Fundação Manuel Leão.

Booker, C. L., Skew, A. J., Sacker, A., and Kelly, Y. J. (2014). Well-being in adolescence - an association with health-related behaviors: findings from understanding society, the UK household longitudinal study. *J. Early Adolesc.* 34, 518–538. doi: 10.1177/0272431613501082

Calp, Ş. (2020). Peaceful and happy schools: how to build positive learning environments. *Int. Electron. J. Elem. Educ.* 12, 311–320. doi: 10.26822/Iejee.2020459460

Capone, V., Joshanloo, M., and Park, M. S.-A. (2019). Burnout, depression, efficacy beliefs, and work-related variables among school teachers. *Int. J. Educ. Res.* 95, 97–108. doi: 10.1016/J.Ijer.2019.02.001

Cohen, J., and Michelli, N. M. (2009). School climate: research, policy, practice, and teacher education. *Teach. Coll. Rec.* 111, 180–213. doi: 10.1177/016146810911100108

Coleman, J. S., Campbell, E. Q., Hobson, C. J., Mcpartland, J., Mood, A. M., Weinfeld, F. D., et al. (1966). *Equality of educational opportunity*. Washington: National Center for Educational Statistics.

Dantas, A. R. (2018). Life is what we make of it: Uma Abordagem Sociológica Aos Significados De Felicidade. *Sociol. Line* 18, 13–34. doi: 10.30553/Sociologiaonline.2018.18.1

Díaz, A. S. L. (2019). Happiness at school ¿what do the children say? *Dilemas Contemp. Educ. Política Y Valore Vi* 2:17.

Dumay, X. (2009). Origins and consequences of schools' organizational culture for student achievement. *Educ. Adm. Q.* 45, 523–555. doi: 10.1177/0013161x09335873

Dutschke, G. (2013). Factores Condicionantes De Felicidade Organizacional: Estudio Exploratorio De La Realidad En Portugal. *Rev. De Estud. Empresariales* 1, 21–43.

Dutschke, G., Jacobsohn, L., Dias, Á., and Combadão, J. (2019). The job design happiness scale (Jdhs). *J. Organ. Chang. Manag.* 32, 709–724. doi: 10.1108/Jocm-01-2018-0035

Engels, N., Hotton, G., Devos, G., Bouckenooghe, D., and Aelterman, A. (2008). Principals in schools with a positive school culture. *Educ. Stud.* 34, 159–174. doi: 10.1080/03055690701811263

Feraco, T., Resnati, D., Fregonese, D., Spoto, A., and Meneghetti, C. (2023). An integrated model of school students' academic achievement And life satisfaction: linking soft skills, extracurricular activities, self-regulated learning, motivation, And emotions. *Eur. J. Psychol. Educ.* 38, 109–130. doi: 10.1007/S10212-022-00601-4

Ferreira, A. R. (2018). "Comportamentos De Saúde E Felicidade Em Adolescentes: Um Estudo Exploratório." Dissertação De Mestrado, Departamento De Psicologia E Educação, Universidade Da Beira Interior - Faculdade De Ciências Sociais E Humanas.

Foong, L. Y., Yean, M. B., Nor, M., and Nolan, A. (2018). The influence of practicum supervisors' facilitation styles on student teachers' reflective thinking during collective reflection. *Reflective Pract.* 19, 225–242. doi: 10.1080/14623943.2018.1437406

Gaziel, H. H. (1997). Impact of school culture on effectiveness of secondary schools with disadvantaged students. *J. Educ. Res.* 90, 310–318. doi: 10.1080/00220671.1997.10544587

Giacomoni, C., and Hutz, C. (2008). Escala Multidimensional De Satisfação De Vida Para Crianças: Estudos De Construção E Validação. *Estud. Psicol.* 25, 25–35. doi: 10.1590/S0103-166x2008000100003

Giacomoni, C., Souza, L., and Hutz, C. (2014). O Conceito De Felicidade Em Crianças. *Psico-Usf* 19, 143–153. doi: 10.1590/S1413-82712014000100014

Giản, P., Bảo, Đ., Tâm, T., and Tặc, P. (2021). Happy schools: perspectives and matters of organization-pedagogy in School's building And development. *Int. Educ. Stud.* 14, 92–102. doi: 10.5539/Ies.V14n6p92

Gilman, R., and Huebner, E. S. (2006). Characteristics of adolescents who report very high life satisfaction. *J. Youth Adolesc.* 35, 293–301. doi: 10.1007/S10964-006-9036-7

Gizzi, M. C., and Rädiker, S. (2021). *The practice of qualitative data analysis: research examples using Maxqda. 1st*. Berlin: Maxqda Press.

Gómez-Baya, D., García-Moro, F. J., Muñoz-Silva, A., and Martín-Romero, N. (2021). School satisfaction and happiness in 10-year-old children from seven European countries. *Children* 8:370. doi: 10.3390/Children8050370

Gramaxo, P. (2013). *A Felicidade Organizacional Dos Docentes: Mais Felizes Na Função Que Desempenham Do Que Na Organização Onde Trabalham* Dissertação De Mestrado Tese De Mestrado Em Ciências Da Educação Não Editada, Universidade Nova De Lisboa - Faculdade De Ciências Sociais E Humanas.

Gramaxo, P., Seabra, F., Abelha, M., and Dutschke, G. (2023). What makes a school a happy school? Parents' perspectives. *Educ. Sci.* 13:375. doi: 10.3390/Educsci13040375

Heck, R. H., and Hallinger, P. (2010). Testing a longitudinal model of distributed leadership effects on school improvement. *Leadersh. Q.* 21, 867–885. doi: 10.1016/J.Leaqua.2010.07.013

Helliwell, J., Layard, R., and Sachs, J. (2012). *World happiness report*. New York: UN Sustainable Development Solutions Net-Work.

Holder, M., and Coleman, B. (2009). The contribution of social relationships to Children's happiness. *J. Happiness Stud.* 10, 329–349. doi: 10.1007/S10902-007-9083-0

Huebner, E. S., Hills, K. J., Xu, J., Long, R. F., Kelly, R., and Lyons, M. D. (2014). "Schooling and Children's subjective well-being" in *Handbook of child well-being: theories, methods and policies in global perspective*. eds. A. Ben-Arieh, F. Casas, I. Frønes and J. E. Korbin (Dordrecht: Springer Netherlands), 797–819.

Ince, N. B., Kardas-Isler, N., Akhun, B., and Durmusoglu, M. C. (2022). The dream school: exploring Children's views about schools. *Int. J. Progress. Educ.* 18, 90–104. doi: 10.29329/Ijpe.2022.459.7

Inês, H., Seabra, F., and Pacheco, J. A. (2022). Inclusive curriculum management And teacher training in the 2nd cycle of basic education in Portugal: perceptions of coordinators of initial training courses. *Rev. Port. De Educ.* 35, 310–330. doi: 10.21814/Rpe.21952

Jongbloed, J., and Andres, L. (2015). Elucidating the constructs happiness and wellbeing: a mixed-methods approach. *Int. J. Wellbeing* 5, 1–20. doi: 10.5502/Ijw.V5i3.1

Kuckartz, U., and Rädiker, S. (2019). *Analyzing qualitative data with Maxqda: text, audio, and video*. Cham: Springer.

Kuurme, T., and Heinla, E. (2020). Significant learning experiences of Estonian basic school students at a school with the reputation of a "happy school". *US-China Educ. Rev. A* 10, 245–259. doi: 10.17265/2161-623x/2020.06.001

Lavalle, I., Payne, L., Gibb, J., and Jelicic, H. (2012). "*Children'S experiences and views of health provision: a rapid review of the evidence*." London: National Children'S Bureau.

Lee, B., and Yoo, M. S. (2014). Family, school, and community correlates of Children's subjective well-being: an international comparative study. *Child Indic. Res.* 8, 151–175. doi: 10.1007/S12187-014-9285-Z

Leithwood, K., and Jantzi, D. (2006). Transformational school leadership for large-scale reform: effects on students, teachers, and their classroom practices. *Sch. Eff. Sch. Improv.* 17, 201–227. doi: 10.1080/09243450600565829

López-Pérez, B., and Fernández-Castilla, B. (2018). Children's and adolescents' conceptions of happiness at school and its relation with their own happiness and their academic performance. *J. Happiness Stud.* 19, 1811–1830. doi: 10.1007/S10902-017-9895-5

López-Pérez, B., Zuffianò, A., and Benito-Ambrona, T. (2022). Cross-cultural differences in Children's conceptualizations of happiness at school. *Eur. J. Dev. Psychol.* 19, 43–63. doi: 10.1080/17405629.2020.1865142

Lyubomirsky, S., King, L., and Diener, E. (2005). The benefits of frequent positive affect: does happiness Lead to Sucess? *Psychol. Bull.* 131, 803–855. doi: 10.1037/0033-2909.131.6.803

Macneil, A., Prater, D. L., and Busch, S. (2009). The effects of school culture and climate on student achievement. *Int. J. Leadersh. Educ.* 12, 73–84. doi: 10.1080/13603120701576241

Mayring, P. (2014). *Qualitative content analysis - theoretical foundation, basic procedures and software solution*. Austria: Klagenfurt.

Mertoğlu, M. (2020). Factors affecting happiness of school children. *J. Educ. Train. Stud.* 8, 10–20. doi: 10.11114/Jets.V8i3.4674

Mínguez, A. M. (2020). Children'S relationships and happiness: the role of family, friends and the school in four European countries. *J. Happiness Stud.* 21, 1859–1878. doi: 10.1007/S10902-019-00160-4

Noddings, N. (2003). *Happiness and education*. New York: Cambridge.

O'Rourke, J., and Cooper, M. (2010). Lucky to be happy: a study of happiness in Australian primary students. *Aust. J. Educ. Dev. Psychol.* 10, 94–107.

OECD (2017a). "*Education at a glance 2017: OECD indicators*." Paris. OECD Publishing.

OECD (2017b). "*Pisa 2015 Results (Volume Iii): Student'S Well-Being*." Paris. OECD Publishing.

OECD (2019). "*Pisa 2018 results (volume iii): What school life means for students' lives*." Paris. OECD Publishing.

OECD (2021). "*Education at a glance 2021: OECD indicators*." Paris. OECD Publishing.

Oreopoulos, P., and Salvanes, K. G. (2011). Priceless: the nonpecuniary benefits of schooling. *J. Econ. Perspect.* 25, 159–184. doi: 10.2307/23049443

Pacheco, J. A., and Seabra, F. (2013). "Curriculum field in Portugal: emergence, research, and Europeanization" in *International handbook of curriculum research*. ed. W. Pinar (London: Routledge), 397–410.

Parey, M., Carneiro, P., and Meghir, C. (2013). Maternal education, home environments, and the development of children and adolescents. *J. Eur. Econ. Assoc.* 11, 123–160. doi: 10.1111/J.1542-4774.2012.01096.X

Quay, J., Gray, T., Thomas, G., Allen-Craig, S., Asfeldt, M., Andkjaer, S., et al. (2020). What future/S for outdoor and environmental education in a world that has contended with Covid-19? *J. Outdoor Environ. Educ.* 23, 93–117. doi: 10.1007/S42322-020-00059-2

Rudasill, K. M., Snyder, K. E., Levinson, H., and Adelson, J. L. (2018). Systems view of school climate: a theoretical framework for research. *Educ. Psychol. Rev.* 30, 35–60. doi: 10.1007/S10648-017-9401-Y

Seabra, F., Mouraz, A., Henriques, S., and Abelha, M. (2021). Teacher supervision in educational policy and practice: perspectives from the external evaluation of schools in Portugal. *Educ. Policy Anal. Arch.* 29:27. doi: 10.14507/Epaa.29.6486

Seligman, M., Randal, E., Jane, G., Karen, R., and Mark, L. (2009). "Positive education: Positive Psychology and classroom interventions." *Oxford Review of Education*. 35, 293–311. doi: 10.1080/03054980902934563

Soleimani, N., and Tebyanian, E. (2011). A study of the relationship between principals' creativity and degree of environmental happiness in Semnan high schools. *Procedia. Soc. Behav. Sci.* 29, 1869–1876. doi: 10.1016/J.Sbspro.2011.11.436

Stearns, P. N. (2019). Happy children: a modern emotional commitment. *Front. Psychol.* 10:2025. doi: 10.3389/Fpsyg.2019.02025

Stronge, J. H. (2018). *Qualities of effective teachers. 3rd*. Alexandria: ASCD.

Talebzadeh, F., and Samkan, M. (2011). Happiness for our kids in schools: a conceptual model. *Procedia. Soc. Behav. Sci.* 29, 1462–1471. doi: 10.1016/J.Sbspro.2011.11.386

UNESCO (2014). "*Learning to live together: education policies And realities in the Asia-Pacific*." Paris: UNESCO Digital Library.

UNESCO (2016). "Happy schools! A framework for learner well-being in the Asia-Pacific." Paris: UNESCO Digital Library.

UNESCO (2021). "Happy schools: capacity building for learner well-being in the Asia-Pacific; findings from the 2018-2020 pilots in Japan, Lao Pdr, and Thailand." Paris: Unesco Digital Library.

Uusitalo-Malmivaara, L. (2014). Happiness decreases during early adolescence - a study on 12- And 15-year-old Finnish students. *Psychology* 05, 541–555. doi: 10.4236/Psych.2014.56064

Veenhoven, Ruut. (2012). *Evidence based pursuit of happiness: What should we know, do we know and can we get to know?* Munich: University Library of Munich.

Wright, T., Nankin, I., Boonstra, K., and Blair, E. (2019). Changing through relationships and reflection: an exploratory investigation of pre-service teachers' perceptions of young children experiencing homelessness. *Early Childhood Educ. J.* 47, 297–308. doi: 10.1007/S10643-018-0921-Y

Zullig, K. J., Koopman, T. M., Patton, J. M., and Ubbes, V. A. (2010). School climate: historical review, instrument development, and school assessment. *J. Psychoeduc. Assess.* 28, 139–152. doi: 10.1177/0734282909344205

Appendix A

Questionnaire applied to the students:

1. How old are you? (Open answer).
2. What is your sex? (Possible answers: Male/Female/Other or prefer not to answer).
3. How happy do you feel at school? (Possible answers: 5-point Likert scale from 1 (very unhappy) to 5 (very happy)).
4. What makes you happy at school? (Open-ended question).
5. What makes you unhappy at school? (Open-ended question).
6. In your opinion, what are the characteristics of a happy school? (Open-ended question).

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Navigating Technostress in primary schools: a study on teacher experiences, school support, and health

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The COVID-19 pandemic has led to a global shift toward online education, which has increased the use of technology for communication, management, and remote teaching. This study aimed to investigate how primary school teachers in China used technology during the Pandemic and to what extent they experienced Technostress, as well as the impact of Technostress on work–family conflicts and technology-induced health issues. A survey was conducted among 1,172 primary school teachers, and the results revealed that teachers exhibited a moderate to a high level of Technostress during the Pandemic, with differences observed in gender, age, and headteacher duties. Furthermore, Technostress was positively correlated with work–family conflicts and technology-induced health issues. Technology use intensity was found to directly impact work–family conflicts and personal health and indirectly impact them via the agency effects of Technostress. School support moderated the indirect relationship between technology use intensity and work–family conflicts and health issues, with higher levels of school support leading to less apparent impacts of technology intensity on work–family conflicts and personal health via the agency effect of Technostress. These findings provide timely insights for post-pandemic teacher training and technology management and suggest the importance of school support in promoting sustainable educational development.

KEYWORDS

Technostress, primary teachers, school support, work–family conflicts, personal health

1 Introduction

The breakout of COVID-19 has forced many countries to issue strict policies for social distancing and intermittent quarantine (e.g., Shigemura et al., 2020). Worldwide, universities and schools have required their teachers and students to shift from offline classes to partially or fully online classes during severe pandemic times (Patel et al., 2020). For teachers, the abrupt change of teaching mode has naturally incurred more technology use for frequent remote education, communication, and management (e.g., Rey-Merchán and López-Arquillos, 2022).

Indisputably, technology has profoundly changed our ways of life and work, with numerous benefits like increased efficiency and convenience; however, its misuse or overuse may also cause negative effects. This has been manifested by increased phone addiction (Sahu et al., 2019), cyberbullying (Gaffney et al., 2019), and data breaches (Cadwalladr and Graham-Harrison,

2018), among other things. One of the significant issues is "Technostress," a type of psychological distress caused by technology use (Brod, 1984). Research has concluded that Technostress could impact users' perceived work overload, cause demotivation, and lead to job dissatisfaction (Ragu-Nathan et al., 2008). However, the majority of Technostress studies have been framed within a business or industrial work context (Jung et al., 2012; Salanova et al., 2014; Tarafdar et al., 2015; Hsiao, 2017; Marchiori et al., 2019), whereas a small but increasing number of studies are now focusing on the educational context (e.g., Joo et al., 2016; Syvänen et al., 2016; Penado-Abilleira et al., 2020).

Teachers, who are increasingly required to integrate emerging technologies into their teaching, management, and communication with students and parents, often struggle with cognitive and psychological technology use (Tarus et al., 2015; Voet and De Wever, 2017). With the breakout and enduring effects of COVID-19 as a backdrop, teachers of all levels of education are encountering even more challenges than ever before (e.g., Mushtaque et al., 2021). According to Wang et al. (2021), primary school teachers who were required to teach online during the quarantine "felt that 'online teaching and preparation is too exhausting' and it was hard to 'maintain such a high level of energy and devotion' while dealing with their own family affairs at home." For example, a math teacher who was interviewed reported that she had to make numerous announcements daily via the Dingding platform to keep her students engaged and prevent them from falling behind (Wang et al., 2021).

Additionally, even physical education (PE) teachers, who were least frequently required to use technology before, have been asked to utilize online technologies to create video lectures and distribute exercises for their students (Wang et al., 2021). Given the above, it can be reasonably expected that primary school teachers' use of technology has increased, leading to increased pressure.

Compared to middle or high school teachers, primary school teachers mainly interact with younger students who are more prone to misbehavior and are more likely to profoundly affect their psychological, cognitive, and behavioral development. For instance, McLean et al. (2023) highlight that elementary teachers, including primary school teachers, are responsible for providing primary, daily instruction in multiple content areas to a single group of students. This suggests that primary school teachers have more direct and consistent interaction with younger students, which can profoundly impact their psychological, cognitive, and behavioral development. Without appropriate policies and interventions, primary school teachers may lack effective strategies to overcome such challenges, jeopardizing their well-being, student outcomes, and overall educational sustainability. Therefore, it is essential to examine the current level of Technostress among primary school teachers, identify potential contributing factors and significant consequences, and provide schools and districts with conducive adaptations that promote teachers' well-being and, ultimately, student outcomes.

Therefore, the present paper sought to answer the following questions through a survey research design: (1) What is the current status of technology intensity and Technostress among primary school teachers? (2) How do primary school teachers' technostress levels differ in demographic variables? (3) How do primary school teachers' technology intensity and perceived school support impact their work–family conflicts? (4) How do primary school teachers' technology intensity and perceived school support impact their health?

2 Literature review

2.1 Technostress

Technostress was formally conceptualized and introduced to the public by Brod (1984) in the book Technostress: The Human Cost of the Computer Revolution. Brod defined Technostress as "a modern disease of adaptation caused by the inability to cope with new technologies in a healthy manner" (s.n.). Due to rapid industrialization and modernization, current organizations are characterized by an increasing emphasis on knowledge-intensive work, which requires employees to constantly interact with evolving ICT and make frequent physical, social, and cognitive adjustments. As a result, technology use's negative effects can lead to physiological and psychological issues. Technostress can cause physiological symptoms such as tiredness (Salanova et al., 2014), crankiness, and insomnia (Porter and Kakabadse, 2006), as well as psychological problems, including a sense of frustration, perceived time pressure, and increased cognitive load (Mark et al., 2008), skepticism, and a sense of incompetence (Salanova et al., 2014). Technostress can also indirectly affect organizational outcomes, such as deteriorated work ethics, dissatisfaction with work, work-life conflicts, and reduced employee productivity (Tarafdar et al., 2007).

In addition to examining the effects of Technostress, previous literature also sought to conceptualize and measure Technostress. As was mentioned earlier, Technostress refers to stress experienced by end users resulting from their usage of information and communication technologies. Essentially, it is a type of stress and may be understood from the organizational behavior literature. Based on the Transaction-Based Model, stress is deemed as a combination of stressors (i.e., the events, demands, stimuli or conditions that individuals encounter and appraise as potentially exceeding their capabilities) and the individuals' cognitive, emotional, and behavioral responses to those stressors. Therefore, Ragu-Nathan et al. (2008) conceptualized Technostress as stemming from factors that create stress from use of ICT and end-users' response to such stress (e.g., feeling worried or sacrificing leisure time for work). By referring to both extant literature and practitioner observations, Ragu-Nathan et al. (2008) identified five dimensions of Technostress creators; namely, they were techno-invasion, techno-overload, techno-complexity, techno-insecurity, and techno-uncertainty. To assess these dimensions, they developed a scale with questions corresponding to each one. Although the scale was originally developed to measure responses from 680 white-collared organizational end users, the questions asked are sufficiently general to also apply to other groups that regularly use ICT such as teachers, small business owners, and teleworkers. For example, Califf et al. (2020) adapted this scale to measure 204 nurses' Technostress, while Jena (2015) surveyed 216 academicians in India using an adapted version as well. Overall, Ragu-Nathan et al. (2008) scale provides a useful, validated instrument for assessing multiple facets of Technostress experienced by users of modern ICT across a variety of contexts. Specifically, techno-invasion is defined as the highly diffused use

of technologies without any limitation or consideration of space and time, putting users at a high risk of being interrupted out of business hours (Tarafdar et al., 2007; Gaudioso et al., 2017). Techno-overload occurs when an employee receives the same information from multiple channels simultaneously, causing cognitive redundancy and repetition (Tarafdar et al., 2007; Gaudioso et al., 2017). Techno-complexity is a negative feeling that the target ICT is difficult to learn and can take tremendous effort to master. Techno-insecurity is depicted as the perception that ICT are frequently updated, which could eventually replace human beings' jobs (Tarafdar et al., 2007). Finally, techno-uncertainty denotes the situation when a user perceives the introduction of new ICT as a manifestation of instability and unpredictability (Tarafdar et al., 2007).

The third strand of research focuses on the causes or contributing factors of Technostress, which have been suggested to include lack of institutional support (Wang et al., 2008; Salanova et al., 2014), fatigue (Khuntia et al., 2015), interruptions resulting from multitasking (Mark et al., 2008; Ragu-Nathan et al., 2008; Tarafdar et al., 2015), absence of effective personal coping mechanisms (Rohwer et al., 2022), and other demographic factors (Ursavaş et al., 2011; Tarafdar et al., 2015).

It has also been pointed out that the level of Technostress seems to vary by gender and age. For example, some findings indicate that older employees might not experience as much Technostress as their younger counterparts (e.g., Ragu-Nathan et al., 2008), probably because the former had already become accustomed to the work environment and thus could handle related stress more effectively than the latter (Tarafdar et al., 2015). As for gender differences in Technostress, mixed results have been reported. For instance, Ong and Lai (2006) found that women generally experienced more computer anxiety than men, while Ragu-Nathan et al. (2008) concluded that male employees suffered from Technostress more, and some other studies found no gender difference at all (Shah et al., 2012).

2.2 Teachers' Technostress

"The complexity and intensity of the pressures on teachers and the pace of education reform are unprecedented" (Grenville-Cleave and Boniwell, 2012, p. 3). Golembiewski et al. (1983) deduced that the teaching profession strongly correlated with elevated work stress. Uzair and Bhaumik (2023) also emphasized that teaching ranks among the most stressful professions globally due to continuous changes in scientific and technological advances from the 1990s to the present. Teachers' roles are expected to evolve from mere "transmitters of knowledge" to instructional designers possessing expertise in pedagogy, technology, and content knowledge. Compared to other professions, teachers are likely among the first to benefit from and suffer due to technological advancements. On the one hand, teaching as a profession demands work beyond classroom time or regular working hours, which associates with high levels of burnout (Ernst Kossek and Ozeki, 1998; Hakanen et al., 2006). Such distinctive characteristics of the teaching profession could potentially induce considerable stress and psychosocial problems (Dussault and Deaudelin, 1999; Fullan, 2001).

On the other hand, given the strategic role of education in any country, teachers are often expected to master innovative technologies to revolutionize teaching and nurture competitive global citizens for the future. For example, driven by educational initiatives like TPACK, teachers must now devote greater attention to integrating technology into teaching (Graham, 2011). Ultimately, it is recognized that teachers' ability to integrate technology into students' meaningful learning is crucial to the success of educational innovation (Schildkamp et al., 2020).

Despite this, teachers often need help with the timely and efficient acquisition of relevant skills due to the constant emergence and updating of new technologies (Tarus et al., 2015). Teachers either lack access to such knowledge (Altınay-Gazi and Altınay-Aksal, 2017; Li and Wang, 2021) or when they do have access, their limited time precludes frequent technology learning—in a comparative study between teachers ($n = 150$) and non-teachers ($n = 148$), Grenville-Cleave and Boniwell (2012) discovered that teachers' perceived well-being was statistically significantly lower than that of non-teachers. A national survey of 24,100 teachers from 428 schools in Britain suggested that teachers' overall well-being strongly correlated with students' performance (Briner and Dewberry, 2007, as cited in Atteh et al., 2020, p. 50). Given the prolonged daily interaction between primary school teachers and students, ensuring teachers' mental and physical health is essential.

Nonetheless, existing research on teachers' Technostress remains limited. An advanced search with Technostress and teachers as abstract keywords yielded only 15 full-text papers. Among these, nine included teachers of mixed educational levels (e.g., Hassan et al., 2018; Dong et al., 2020; Khlaif et al., 2022), four focused on university teachers (e.g., Li and Wang, 2021), one on high school only (Magistra et al., 2021), and one on secondary school only (Joo et al., 2016). While these studies have provided insightful contributions to Technostress' creators, inhibitors, and mediators, none exclusively focused on primary teachers. Moreover, the role of significant variables, such as work–family conflicts and teachers' well-being, has yet to be examined in these studies. As is pointed out by Cerrato and Cifre (2018), there is growing interest in investigating work–family conflicts in organizational psychology research concerning job performance and satisfaction. Previous research indicates that employees' deep involvement in home affairs impedes desirable job participation and productivity (Huang et al., 2004). Some known factors impacting work-life conflict include excessive workload, ambiguous roles, organizational culture, and work environment (Atteh et al., 2020). It has been argued that "teachers experiencing high rates of work–family conflicts end up with extended periods of stress, become disconnected from their duties and tasks, and have poor job satisfaction" (Ernst Kossek and Ozeki, 1998, as cited in Atteh et al., 2020, p. 50). This is particularly true for headteachers, who are expected to fulfill more diverse roles than non-headteachers, such as establishing cultural identification, managing resources, and maintaining good relationships with parents (Argyriou and Iordanidis, 2014). For instance, a study conducted on 359 headteachers revealed that two-thirds of them reported experiencing high levels of work stress (Scott et al., 2021). Additionally, the teaching profession is frequently associated with certain physical ailments, such as rhinopharyngitis/laryngitis, conjunctivitis, bronchitis, eczema/dermatitis, and varicose veins (Kovess-Masféty et al., 2006). Examining teachers' work–family conflicts and health conditions is equally important because teachers' well-being is positively correlated with students' well-being (Harding et al., 2019).

Therefore, a comprehensive picture of the variables above would likely contribute to a more systematic and holistic understanding of Technostress. Policymakers and school administrators can utilize such information to assist teachers with varying levels of Technostress and even prevent the increase of Technostress with appropriate measures. By addressing work–family conflicts and teachers' well-being, stakeholders can enhance teachers' overall satisfaction and performance, ultimately benefiting students' learning outcomes and the quality of education.

3 Theoretical framework

This study is based on the Conservation of Resources (COR) theory, which provides a comprehensive framework for understanding how individuals react to stress and its impact on their well-being. According to the COR theory (Hobfoll, 1989), individuals strive to acquire, retain, and protect resources they value, like time, energy, skills, and psychological well-being. Stress occurs when there is a threat to or loss of these resources, leading to adverse outcomes. Zhang et al. (2022) provide further evidence by discussing the impact of traumatic events, such as natural disasters, on resource loss. The study identifies four types of resource loss: objects, conditions, personal characteristics, and energies. The threat of resource loss, actual resource loss, or lack of resource gain can lead to psychological stress. In the context of this study, the resources of interest include time, energy, skills, and psychological well-being.

Primary school teachers face challenges posed by increased technology use during the COVID-19 pandemic (Wang et al., 2021). Communication, management, and remote teaching technology have become essential in the transition to online education. However, this increased reliance on technology may result in Technostress, which refers to the stress and strain experienced when individuals perceive technology demands as exceeding their available resources.

By adopting the COR theory, this study examines the impact of Technostress on primary school teachers' work–family conflicts and technology-induced health issues. Furthermore, it explores the role of technology use intensity and school support as important factors that may influence the relationships between Technostress and these outcomes.

Drawing on the COR theory, this study generates hypotheses regarding the relationships between Technostress, technology use intensity, work–family conflicts, personal health, and the moderating role of school support. By integrating this theoretical framework into our analysis, we aim to provide a comprehensive understanding of the mechanisms underlying the experiences of primary school teachers navigating Technostress during the Pandemic.

> *Hypothesis* 1: Primary school teachers' level of technology intensity and Technostress will be high due to the impact of the Pandemic, which disrupted their usual resources and teaching activities.

This hypothesis aligns with the COR theory, which suggests individuals strive to acquire, retain, and protect resources. The pandemic-induced disruptions have likely led to a depletion of resources, such as access to technological tools, training, and support, resulting in increased Technostress among primary school teachers. Previous studies have examined the effects of the COVID-19 pandemic on education and technology use in the teaching profession (Rasmitadila et al., 2020). These studies provide valuable insights into the relationship between the Pandemic, technology intensity, and Technostress among primary school teachers.

> *Hypothesis* 2: Primary school teachers' Technostress levels will vary based on demographic variables. Specifically, female and older teachers, as well as headteachers may experience higher levels of technostress than their counterparts.

This hypothesis aligns with the COR theory as it acknowledges that demographic factors, such as age and gender, can influence the allocation and availability of resources. The theory posits that individuals may experience resource depletion or strain based on these demographic characteristics, which can contribute to differences in technostress levels. Research findings suggest age and gender differences in technostress experiences, although the results are mixed. Older employees tend to experience less Technostress than their younger counterparts (Ragu-Nathan et al., 2008), and women experience more computer anxiety than men (Ong and Lai, 2006). However, some studies find no significant gender difference in technostress levels (Shah et al., 2012).

> *Hypothesis* 3: Higher levels of technology intensity among primary school teachers will be associated with increased work–family conflicts moderated by perceived school support.

This hypothesis aligns with the COR theory by recognizing that higher technology intensity can deplete resources and increase work–family conflicts. The moderating effect of perceived school support suggests that the availability of resources (support) can buffer the negative impact of technology intensity on work–family conflicts, aligning with the protective and buffering role of resources proposed by the COR theory. Technostress has been associated with various factors, including lack of institutional support (Wang et al., 2008; Salanova et al., 2014), interruptions caused by multitasking (Mark et al., 2008; Ragu-Nathan et al., 2008; Tarafdar et al., 2015), and inadequate personal coping mechanisms (Rohwer et al., 2022).

> *Hypothesis* 4: Higher levels of technology intensity among primary school teachers will be associated with poorer personal health outcomes, moderated by perceived school support.

This hypothesis aligns with the COR theory by suggesting that higher technology intensity can deplete resources, leading to poorer personal health outcomes. The moderating effect of perceived school support implies that the availability of resources (support) can mitigate the negative impact of technology intensity on personal health, aligning with the protective and buffering role of resources proposed by the COR theory. For example, Aktan and Toraman (2022) highlighted the negative impact of long-term screen use on teachers' health, including various health problems and technology addiction. The sudden shift to online teaching during the Pandemic has also contributed to psychological and emotional problems for teachers, resulting in burnout and other mental health issues (Stockwell and Wang, 2023).

4 Methods

4.1 Research design

Through a survey research methodology, this study employed a comprehensive questionnaire to gather pertinent data. The survey was accessible from October 8th to November 28th, 2021, collecting 1,172 valid and anonymous responses. Data acquisition was facilitated through WJX.cn, a prominent online questionnaire platform extensively utilized in China for research purposes. This approach allowed for the efficient and secure collection of valuable insights, which were subsequently analyzed to further our understanding of the subject matter.

4.2 Participants

The study's participants comprised primary teachers from two distinct provinces and districts in eastern China. The sample was predominantly female, with 941 (80.3%) female teachers and 231 (19.7%) male teachers. Most respondents ($n = 496$, 42.2%) fell within the age bracket of 31 to 40. Regarding teaching experience, a substantial proportion (45.5%) of the participants were seasoned teachers with over a decade of experience, while 28.1% were relatively new to the profession, having accrued less than 3 years of experience. This diverse sample allowed for a robust exploration of perspectives across various demographic and professional backgrounds.

4.3 Ethical approval

This study received ethical approval from the Ethical Committee Review Board at Teacher's College of Qingdao University. The research procedures, including data collection and participant anonymity, were ensured in strict accordance with the ethical guidelines and standards established by our institution. Participants' informed consent was obtained upon clicking corresponding buttons in the online platform, and every effort was made to protect their confidentiality and privacy throughout the study.

4.4 Data collection

The lead investigators initiated the data collection by disseminating the online survey link to a reputable teacher-researcher within the target region. This individual subsequently extended invitations to 14 primary school principals, who voluntarily assisted in distributing the survey link to a broader network of teachers. Informed consent was secured as potential participants were presented with the study description and voluntarily agreed to partake by selecting the appropriate buttons on the survey webpage. All completed surveys were submitted anonymously to ensure confidentiality and promote candid responses.

4.5 Instruments

The comprehensive questionnaire encompassed 45 items, organized into six distinct sections: demographic information (10), technology intensity (5), Technostress (15), school support (5), work–family conflicts (5), and personal health issues (5). The demographic section comprised 10 questions to elicit relevant background information, including participants' gender, age, and years of teaching experience, among other pertinent details. This structured approach facilitated the systematic collection and analysis of data to understand better the multifaceted relationships between the various factors under investigation.

The technology intensity dimension aimed to assess the daily duration primary school teachers devoted to digital technology utilization across various professional responsibilities, including teaching, lesson preparation, administrative tasks, communication with students' parents, and attending to personal matters. This section featured five custom-designed questions: "How long do you spend preparing lessons with technologies daily?" The internal consistency of this dimension, as indicated by Cronbach's α, was determined to be 0.66, suggesting an acceptable level of reliability. It should be cautioned that we deliberately decided to utilize different reply options for a long time in designing these questions. This decision was based on the nature of the activities and tasks associated with technology use among the participants. Some technology-intensive tasks (e.g., lesson preparation and completing administrative tasks) required a more specific time range, ranging from 30 min to 2 h, to capture those activities' duration accurately.

On the other hand, other technology-intensive tasks were better represented using a broader time frame, including reply options of 1, 2, 3, and 4 h (i.e., the time spent on teaching with technology). By providing a range of response options, we aimed to ensure that participants could select the option that best reflected their engagement in technology-related activities. This approach allowed for a more nuanced and accurate assessment of technology intensity among the participants. We acknowledge that using different reply options may introduce some variability in the data, but we believe that the benefits of capturing a comprehensive picture of technology intensity outweigh the potential limitations introduced by the varied response options.

Adapted from Ragu-Nathan et al. (2008) work, which consisted of 28 questions on Technostress creators (i.e., techno-overload, techno-uncertainty, techno-complexity, techno-invasion, and techno-insecurity), we tentatively eliminated those that were assessed as inappropriate or unnecessary for capturing primary school teachers' actuality in China upon rigorous discussion. Afterwards, 15 questions were initially kept to be used concertedly with other survey constructs. Confirmatory factor analysis (CFA) of the five-dimensional Technostress scale revealed that items techno-overload 1 (0.49) and techno-invasion 3 (0.34) exhibited underestimation of the corresponding dimensions. Upon removal of these two items, the model demonstrated a satisfactory fit with $\chi^2/pdf = 4.67$, CFI = 0.95, TLI = 0.93, RMSEA = 0.08, and SRMR = 0.05, thus indicating strong construct validity of the scale. The overall Cronbach's α for all items in the current study was 0.89, while Cronbach's α values for each dimension were 0.79, 0.81, 0.89, 0.65, and 0.84. An example statement from this section is, "Due to the pervasive use of technology, your time spent with your family has decreased." The response scale ranged from 1 (Strongly disagree) to 5 (Strongly agree).

The school support scale featured five items adapted from Lam et al. (2010) work, with respondents being asked to indicate their level of agreement with statements such as, "The training provided by our school helped me understand how to integrate technology into teaching." The scale demonstrated high reliability, with a Cronbach's α of 0.91.

The work–family conflicts scale included five questions from Carlson et al.'s (2000) research, with a Cronbach's α of 0.89. Participants were prompted to indicate their agreement level with the statements, utilizing a range of 1 (Strongly disagree) to 5 (Strongly agree). Higher scores signified increased work–family conflicts.

Lastly, personal health issues were assessed through five custom-designed items, inquiring about the frequency of technology-related health concerns, such as "How frequently do you feel visual tiredness because of technology use?" The scale exhibited strong reliability, with a Cronbach's α of 0.93. A higher score denoted more frequent experiences of technology-induced health symptoms.

4.6 Data analysis

SPSS26.0 was used to perform descriptive statistics, bivariate analysis, and difference tests. Moderated mediation effects were tested by PROCESS v3.4.0.

5 Results

5.1 Primary teachers' technology intensity and Technostress during the pandemic

Figure 1 illustrates the distribution of time primary school teachers spend in China on lesson preparation using digital technology. A notable 31.7% of respondents reported dedicating more than 2 h to this task, while 28.3% allocated between one and 2 h. A smaller percentage (11.3%) indicated they spent less than 30 min utilizing technology for lesson preparation.

Concerning technology use in teaching, most primary school teachers (82.9%) devoted approximately one to 2 h daily to this aspect of their practice. A small proportion of teachers (4.8%) reported an exceptional 4 h or more of daily technology use in teaching. This data highlights the variability in technology adoption and utilization across primary school classrooms in China.

Furthermore, Figure 2 (left) presents a relatively even distribution of teachers' time spent on administrative tasks using digital technology. A majority (56.5%) reported spending less than 1 h, while 21.1% allocated between one and 2 h, and 22.4% devoted more than 2 h to these tasks. Regarding communication with students' parents via technology (Figure 2, right), the largest proportion of teachers (35.3%) indicated spending over 30 min on this activity. This finding highlights the diverse range of time commitments associated with various aspects of technology use in the professional lives of primary school teachers.

Regarding time spent using technology for personal affairs (Figure 3), most teachers (73%) reported devoting less than 30 min daily, while 27% indicated spending over 30 min on such activities. Considering all aspects of technology use, it can be inferred that primary school teachers engage with digital tools for approximately 4 to 6 h per day, irrespective of the specific purposes for which they are employed. This highlights the pervasive role of technology in teachers' professional and personal lives.

Regarding the Technostress level (refer to Table 1), the data reveals that primary school teachers, on average, experience a moderate to high level of Technostress, with a mean score of 3.41 on a scale of 1 to 5. In other words, Hypothesis 1 was supported. Specifically, among the five sub-categories, techno-uncertainty and techno-overload scores were notably higher than those of the other dimensions. At the same time, techno-complexity registered the lowest score—a repeated measures ANOVA was subsequently conducted to investigate differences between dimensions.

Before conducting the repeated measures ANOVA, we initially assessed the normality of the data using the Kolmogorov–Smirnov (K-S) and Shapiro–Wilk (S-W) tests on the five dimensions of Technostress. The results of these tests indicated that all five dimensions had $p < 0.001$, suggesting a potential violation of the normality assumption. However, it is important to note that upon further examination, including the review of histograms and normal curves of the comprehensive dataset, we observed that the absolute values of kurtosis and skewness for the five dimensions of Technostress were all less than 1. This observation aligns with the criterion suggested by Gravetter and Wallnau (2014) and Field (2000), where absolute values less than 2 are considered indicative of data that approximates a normal distribution. Additionally, considering our large sample size ($N = 1,172$), it is reasonable to approximate that the data follows a normal distribution, making parametric tests appropriate for our analysis. We chose to employ parametric tests due to their robustness when the data is normally distributed. We acknowledge that the nonparametric tests yielded consistent results with the parametric tests, but we opted for parametric analyses to maximize the sensitivity of our statistical tests and adhere to established practices in the field.

To provide a more accurate description of the data results, the present study further employed the Friedman test, which revealed significant differences in the five dimensions of Technostress

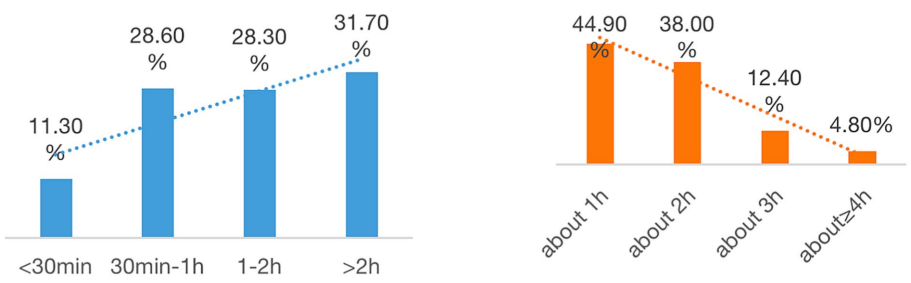

FIGURE 1
Daily time spent on lesson planning (left) and teaching (right).

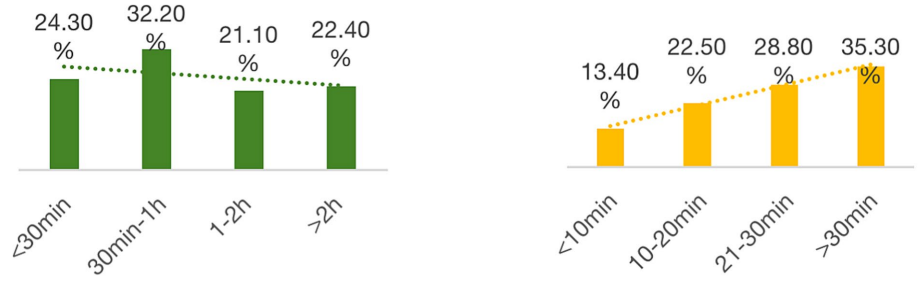

FIGURE 2
Daily time on administrative tasks (left) and parent communication (right).

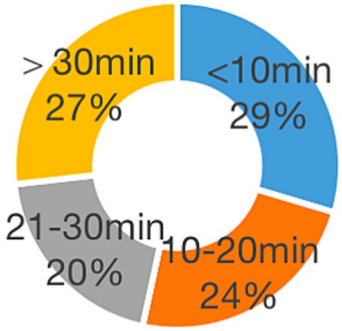

FIGURE 3
Daily time spent resolving personal affairs with technology.

TABLE 1 Descriptive statistics of primary school teachers' technostress ($N = 1,172$).

Rank	Dimension	N	*M*	*SD*
	Technostress	1,172	3.41	0.81
1	*Techno-uncertainty*	1,172	3.78	1.02
2	*Techno-overload*	1,172	3.55	1.07
2	*Techno-invasion*	1,172	3.51	1.21
3	*Techno-insecurity*	1,172	3.27	0.92
4	*Techno-complexity*	1,172	3.12	1.14

The higher the ranking, the more technostress the teachers perceived.

among the teachers ($Z = 396.94$, $p < 0.001$). Specifically, teachers perceived the highest levels of techno-uncertainty, followed by techno-overload and techno-invasion (with no significant difference observed between the latter two dimensions, $Z = 0.385$, $p = 1$), and the lowest levels of techno-insecurity and techno-complexity. The results from the nonparametric test were consistent with those obtained from the parametric test. Following the recommendations of Gravetter and Wallnau (2014) and Field (2000), the data in this study were considered to approximate a normal distribution, and the results of the parametric tests were used.

To sum up, results of Friedman rank sum tests indicated that there were statistically significant differences among the five Technostress dimensions overall ($p < 0.05$). Follow-up comparisons showed that the means for techno-overload and techno-invasion were not significantly different from each other, but were significantly higher than the means for techno-insecurity, techno-complexity, and techno-uncertainty ($p < 0.05$). Additionally, pairwise comparisons revealed that the means for techno-insecurity, techno-complexity, and techno-uncertainty did not differ statistically from each other. To summarize, the Friedman test revealed significant differences among groups overall, while post-hoc analyses showed techno-overload and techno-invasion were highest and equivalent, and techno-insecurity, complexity, and uncertainty were lower but equivalent.

5.2 Demographic differences in primary teachers' Technostress

In the above section, we demonstrated that the data on Technostress among primary school teachers approximates a normal distribution, including the overall mean score of Technostress. Therefore, a one-way ANOVA examined significant differences between age and teaching experience. At the same time, t-tests were used to assess gender and headteacher (yes/no) differences in Technostress.

Kruskal-Wallis tests were performed to provide a more accurate description of the data results to analyze differences between different age and teaching experience groups. The results revealed significant differences in Technostress among teachers based on age ($H = 90.25$, $p < 0.001$), indicating that higher age was associated with higher perceived Technostress. Additionally, there were significant differences in Technostress based on teaching experience ($H = 119.67$, $p < 0.001$), indicating that longer teaching experience was associated with higher perceived Technostress. Using the U-Mann–Whitney test, significant gender differences were observed in Technostress ($Z = 4.16$, $p < 0.001$), with male teachers reporting significantly higher levels of Technostress than female teachers. Furthermore, headteachers (yes/no) also exhibited significant differences in Technostress ($Z = 2.27$, $p < 0.05$), with headteachers reporting significantly higher levels of Technostress compared to non-headteachers. The results from the nonparametric tests were consistent with those obtained from the parametric tests. Following the recommendations of Gravetter and Wallnau (2014) and Field (2000), the data in this study were considered to approximate a normal distribution, and the results of the parametric tests were used. Therefore, Hypothesis 2 was supported as well (Table 2).

TABLE 2 Demographic differences in primary teachers' technostress.

Demographics	Distribution	Technostress		
		M ± SD	*F/t*	*p*
Age	20–30 (*n* = 330, 28.2%)	3.12 ± 0.83	29.59	<0.001***
	31–40 (*n* = 494, 42.2%)	3.42 ± 0.78		
	41–50 (*n* = 260, 22.2%)	3.65 ± 0.75		
	51–60 (*n* = 88, 7.5%)	3.76 ± 0.67		
Gender	Male (*n* = 231, 80.3%)	3.62 ± 0.85	4.30	<0.001***
	Female (*n* = 941, 19.7%)	3.36 ± 0.79		
Teaching years	< 3 years (*n* = 329, 28.1%)	3.10 ± 0.78	39.04	<0.001***
	3–5 years (*n* = 151, 12.9%)	3.24 ± 0.81		
	5–10 years (*n* = 159, 13.6%)	3.39 ± 0.79		
	>10 years (*n* = 533, 45.5%)	3.66 ± 0.75		
Headteacher or not	Headteacher (*n* = 628, 53.6%)	3.46 ± 0.82	2.22	0.026*
	Non-headteacher (*n* = 544, 46.4%)	3.36 ± 0.79		

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

5.3 Impact of primary teachers' technology use and perceived school support on their work–family conflicts

Given that all variables were collected through self-reported questionnaires, assessing the potential for common method bias was necessary. Harman's single-factor test (Podsakoff et al., 2003) revealed nine factors with eigenvalues greater than 1. The largest unrotated common factor accounted for 27.29% of the variance, which falls below the 40% critical threshold (Tang and Wen, 2020). These findings suggest that common method bias was not a significant concern in the present study.

The mean, standard deviation, and correlation matrix for each variable are presented in Table 3. Correlation analysis revealed that Technostress was significantly positively correlated with technology intensity, school support, work–family conflicts, and personal health issues. Conversely, school support demonstrated a significant negative correlation with Technostress, technology intensity, work–family conflicts, and health issues. Age positively correlated with Technostress, work–family conflicts, and personal health issues while negatively correlated with technology intensity.

Regarding research question 2, results indicated gender differences in primary teachers' Technostress ($t = 4.30$, $p < 0.001$). Additionally, work–family conflicts may arise from excessive workload, and previous research has found that primary school headteachers experience higher levels of job dissatisfaction and stress than their colleagues (Chaplain, 2001). Consequently, gender, age, and headteacher status were incorporated into the current study as control variables (Table 3).

5.3.1 The mediating effect of Technostress

As presented in Table 4, technology intensity significantly and positively predicted Technostress ($\beta = 0.14$, $p < 0.001$) and work–family conflicts ($\beta = 0.13$, $p < 0.01$). Additionally, Technostress demonstrated a significant positive predictive effect on work–family conflicts ($\beta = 0.54$, $p < 0.001$), even after controlling for teachers' gender, age, and headteacher status. These findings suggest that Technostress partially mediates the relationship between technology intensity and work–family conflicts.

To further assess the magnitude of the indirect effect, 5,000 bootstrapping samples were generated from the original dataset using random sampling. The results indicated an indirect effect of 0.08, with a standard error (SE) of 0.02 and a 95% confidence interval (CI) of [0.04, 0.12]. As the empirical 95% CI does not include zero, it can be concluded that technology intensity significantly indirectly affects teachers' work–family conflicts.

5.3.2 Testing the moderated mediating effect of school support

The results of multiple linear regression revealed that technology intensity significantly and positively predicted Technostress ($\beta = 0.14$, $p < 0.001$), while the interaction between technology intensity and school support ($\beta = -0.08$, $p < 0.05$) significantly and negatively predicted Technostress (Table 4, Model 1), after controlling for covariates. The simple slope test results demonstrated that when the level of school support was low (M-1SD), technology intensity significantly and positively predicted teachers' Technostress ($\beta = 0.21$, $t = 4.39$, $p < 0.001$). Conversely, when the level of school support was high (M + 1SD), technology intensity had no significant predictive effect on Technostress ($\beta = 0.05$, $t = 0.93$, $p = 0.35$).

These findings indicate that school support serves as a moderator in the relationship between technology intensity and Technostress. For teachers perceiving low school support, technology intensity was a significant positive predictor of their Technostress. However, the predictive effect was insignificant for those who perceived high school support. The moderating effect is illustrated in Figure 4.

As shown in Table 4 (Model 2), the interaction between school support and technology intensity did not predict work–family conflicts ($\beta = 0.07$, $p = 0.15$), and so did the interaction between school support and Technostress ($\beta = 0.06$, $p = 0.08$). These suggested that school support only moderated the first stage of the mediation process, not the direct and second stages (Figure 5).

TABLE 3 Descriptive statistics and correlations among variables of interest.

	1	2	3	4	5	6	7	8
1. Gender	—							
2. Age	N/A	—						
3. Headteacher	−0.09**	−0.15**	—					
4. Technology intensity	−0.16**	−0.12**	0.25**	—				
5. Technostress	0.13**	0.28**	0.07*	0.09**	—			
6. W-F conflicts	0.06	0.12**	0.08**	0.13**	0.45**	—		
7. Health impact	0.07*	0.17**	0.11**	0.15**	0.55**	0.68**	—	
8. School support	0.03	−0.02	−0.02	−0.07*	−0.06*	−0.17**	−0.18**	—
M	—	—	—	2.46	3.41	3.45	3.39	3.88
SD	—	—	—	0.67	0.81	1.03	1.06	0.82

* $p < 0.05$; ** $p < 0.01$; W-F refers to work-family.

TABLE 4 Model testing of the effects of technology intensity on work–family conflicts.

Predictors	Model 1 (Technostress)		Model 2 (work–family conflicts)	
	β	*t*	*β*	*t*
Gender	0.15	2.50**	0.07	0.91
Age	0.24	9.13***	0.004	0.15
Headteacher	0.14	2.99**	0.07	1.32
Technology intensity	0.14	4.09***	0.13	3.03**
School support	−0.04	1.59	−0.19	−5.79***
Technology intensity×School support	−0.08	−2.12*	0.07	1.43
Technostress×School support			0.06	1.76
Technostress			0.54	14.97***
R^2	0.10		0.24	
F	22.30***		45.44***	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

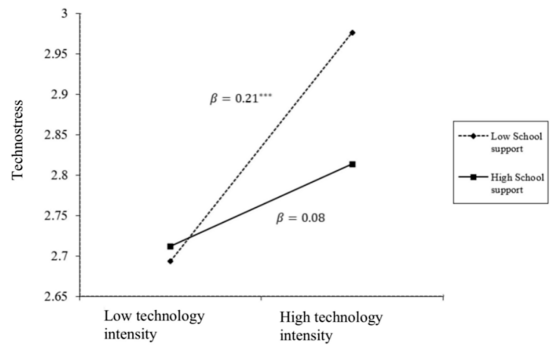

FIGURE 4
The moderating effect of school support.

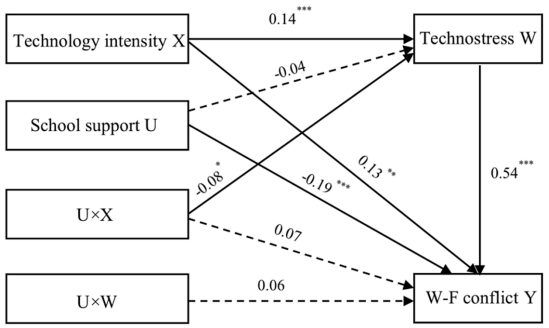

FIGURE 5
The moderated mediation model of the relationship between technology intensity and teachers' work–family conflicts.

Table 5 presents the moderating effect of school support on the direct and indirect effects. When school support was low (M-1SD), with the 95% CI = [0.06, 0.15] excluding zero, technology intensity significantly and positively predicted work–family conflicts through Technostress. However, the indirect effect was insignificant when high school support (M + 1SD), with the 95% CI = [−0.05, 0.25] containing zero. As school support improved, the direct effect increased while the indirect effect decreased. These results suggest that, with the increase

TABLE 5 Decomposition of direct and mediating effects.

Work–family conflicts	School support	Effect size	Boot SE	Boot LLCI	Boot ULCI	Ratio
Direct effect	−0.88(M − 1SD)	0.07	0.06	0.25	−0.05	39.72%
	0.12(M)	0.13	0.04	0.001	0.05	64.89%
	1.12(M + 1SD)	0.20	0.07	0.002	0.07	86.51%
The indirect effect of Technostress	−0.88(M − 1SD)	0.10	0.02	0.06	0.15	60.28%
	0.12(M)	0.07	0.02	0.03	0.11	35.11%
	1.12(M + 1SD)	0.03	0.04	−0.05	0.12	13.49%

in school support levels, technology intensity is more likely to directly and positively predict teachers' work–family conflicts. Therefore, Hypothesis 3 was supported.

5.4 Impact of primary teachers' technology intensity and perceived school support on their health issues

5.4.1 The mediating effect of Technostress

As shown in Table 6, technology intensity significantly positively predicted Technostress ($\beta = 0.14$, $p < 0.001$) and health issues ($\beta = 0.15$, $p < 0.001$), while Technostress had a significant positive prediction effect on health issues ($\beta = 0.67$, $p < 0.001$), even after controlling for teacher's gender, age and headteacher or not. These indicated that Technostress partially mediated the association between technology intensity and health issues. We further generated 5,000 bootstrapping samples from the original dataset by random sampling to assess the size of the indirect effect. The results showed that the indirect effect was 0.09, SE = 0.03, 95%CI = [0.04, 0.14]. Empirical 95% CI did not consist of zero, indicating that technology intensity significantly indirectly affected teachers' health issues.

5.4.2 Testing the moderated mediating effect of school support

As shown in Table 6 (Model 3) and Figure 4, school support moderated the relationship between technology intensity and Technostress. Table 6 (Model 3) showed that the interaction between school support and technology intensity did not predict health issues ($\beta = -0.004$, $p = 0.92$), and so did the interaction between school support and Technostress ($\beta = 0.07$, $p = 0.06$). These suggested that school support only moderated the first stage of the mediation process, not the direct and the second stage. We plotted the moderated mediation in Figure 6.

Table 7 shows the moderating effect of school support on the direct and indirect effects. When school support was low (M-1SD), the 95% CI = [0.09, 0.19] excluding zero, technology intensity positively predicted health issues through Technostress. When school support was at a high level (M + 1SD), with a 95% CI = [−0.06, 0.14] consisting of zero, the indirect effect was insignificant. With the improvement of school support, the direct effect increased while the indirect effect decreased. These indicated that technology intensity positively predicted teachers' health issues directly and indirectly with increased school support levels. Therefore, Hypothesis 4 was supported.

6 Discussion

Since the outbreak of COVID-19, teachers worldwide have increasingly relied on technology to facilitate the transition from traditional classroom settings to frequent remote education. Primary school teachers, who cater to younger students, may face greater challenges in managing student affairs and maintaining engagement than middle school, high school, or university teachers. As a result, primary school teachers might be more susceptible to Technostress, a contemporary issue stemming from technology use that can lead to emotional and physical problems for users. With appropriate intervention and policies, primary school teachers may experience Technostress, contributing to burnout and, ultimately, threatening student well-being and overall educational sustainability.

Through the lens of COR, this study is among the first to focus exclusively on primary school teachers' Technostress, offering valuable insights for policymakers and school administrators. In particular, this research contributes to the existing literature by elucidating the complex yet clear relationships among primary school teachers' Technostress, technology use intensity, school support, work–family conflicts, and personal health issues, significantly impacting teacher performance and student outcomes.

Firstly, primary school teachers engage with technology intensively for approximately 4 to 6 h daily during weekdays, serving various purposes such as lesson preparation, teaching, administrative duties, and communication with students' parents. Due to this intense interaction with technology, teachers generally report moderate to high levels of Technostress. This finding is not surprising, considering that teaching is widely recognized as one of the most stressful professions globally (Golembiewski et al., 1983), and teachers rank among the top occupations frequently acquiring emerging technological knowledge. This observation also clarifies why, among the five stressors of Technostress, techno-uncertainty and techno-overload received the highest ratings. After all, emerging technologies are rapidly evolving worldwide, and when primary school teachers use technology for 4 to 6 h daily, they inevitably face the risk of overload. Moreover, when teachers are not instructing, they must utilize technology to address multifaceted purposes by switching between tasks rather than resolving issues sequentially. Such sporadic technology use compels teachers to multitask, likely contributing to increasing Technostress (Mark et al., 2008; Ragu-Nathan et al., 2008; Tarafdar et al., 2015).

Secondly, there were notable demographic variations in primary school teachers' Technostress. For instance, it was shown

TABLE 6 Model testing of the effects of technology intensity on health issues.

Predictors	Model 3 (Technostress)		Model 4 (Health issues)	
	β	*t*	*β*	*t*
Gender	0.15	2.50**	0.04	0.63
Age	0.24	9.13***	0.05	1.62
Headteacher	0.14	2.99**	0.11	2.09*
Technology intensity	0.14	4.09***	0.15	3.65***
School support	−0.04	1.59	−0.18	−5.89***
Technology intensity×School support	−0.08	−2.12*	−0.004	−0.10
Technostress×School support			0.07	1.87
Technostress			0.67	19.39***
R^2	0.10		0.34	
F	22.30***		74.53***	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

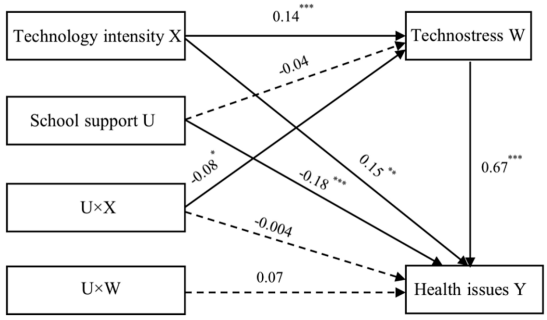

FIGURE 6
The moderated mediation model of the relationship between technology intensity and teachers' health issues.

that male primary school teachers felt greater Technostress than female teachers. This is consistent with Ragu-Nathan et al. (2008) study on corporate employees but conflicts with Ong and Lai's (2006) or Shah et al.'s findings. A possible explanation could be the imbalanced gender distribution in primary schools, where male teachers may be perceived as more tech-savvy and receive more technology-related tasks, as males generally feel more confident using technology than females (Yau and Cheng, 2012). Consistently, a study on gender differences in EFL teachers' use of technology also reported that female teachers used technology less than their male counterparts in teaching (Mahdi and Al-Dera, 2013).

Regarding age, it was found that older primary school teachers experienced higher Technostress levels. This result contradicts Ragu-Nathan et al. (2008) finding that older employees might feel less Technostress than their younger counterparts. Such a disagreement could result from occupational differences. Consistent with societal expectations, teachers often hold higher moral standards for their jobs than other professions, such as salespersons or technical workers (Siu and Lam, 2009). In other words, although older teachers may be less proficient in learning emerging technologies, they remain as motivated as younger teachers in fulfilling professional duties and maintaining a positive reputation, particularly as they approach retirement.

Additionally, Technostress levels increase as primary school teachers' teaching years accumulate. This finding aligns with the age variable results. It could be explained that the longer teachers stay in the profession, the more technologies they need to master alongside other job-related duties and tasks, resulting in heightened Technostress. Furthermore, there was a statistically significant difference between headteachers' and non-headteachers' Technostress. This may be explained by the fact that headteachers are often expected to fulfill more diverse roles than non-headteachers, such as establishing culture identification, managing resources, and maintaining a good relationship with parents (Argyriou and Iordanidis, 2014), and thus likely to suffer from greater work-related stress than regular teachers (Scott et al., 2021).

The demographic differences in Technostress suggest that school administrators should pay particular attention to senior female headteachers. While allocating technology-related tasks based on demographic variances may be unfair or unreasonable, providing additional psychological and technical support for the groups of teachers with greater needs is appropriate and acceptable. This support can help them build positive beliefs and attitudes toward technology use, strongly indicating their eventual use and efficiency (Russell et al., 2003). Providing targeted training and professional development opportunities for these teachers can improve their technical proficiency and reduce their Technostress. This might include offering workshops, mentoring programs, or technology coaching tailored to the specific needs of senior female headteachers or other at-risk groups. Also, fostering a supportive school culture where teachers feel comfortable discussing their Technostress and seeking help from colleagues or administrators can be beneficial. In summary, understanding the demographic differences in Technostress among primary school teachers is crucial for school administrators to create targeted support and intervention programs. Schools can create a more inclusive and supportive environment by addressing senior female headteachers and other at-risk groups' unique needs, ultimately enhancing teacher performance and student outcomes.

Thirdly, our study demonstrated a direct association between primary school teachers' Technostress levels, work–family conflicts, and health issues. In other words, higher levels of Technostress correlated with more frequent occurrences of work–family conflicts

TABLE 7 Decomposition of direct and mediating effects.

Personal health	School support	Effect size	Boot SE	Boot LLCI	Boot ULCI	Ratio
Direct effect	−0.88(M-1SD)	0.15	0.06	0.01	0.04	53.38%
	0.12(M)	0.15	0.04	0.0003	0.07	61.86%
	1.12(M + 1SD)	0.14	0.06	0.02	0.02	78.86%
Indirect effect of technostress	−0.88(M-1SD)	0.13	0.03	0.08	0.19	46.62%
	0.12(M)	0.09	0.03	0.04	0.14	38.14%
	1.12(M + 1SD)	0.04	0.05	−0.06	0.14	21.14%

and health issues. This finding partially supports Tarafdar et al. (2007) claim that Technostress would indirectly impact technology users' work-life conflict. The inconsistency may be attributed to the significant difference in technology integration levels between now and 2007, when smartphones and social networking began gaining popularity. As reported by primary school teachers in our study, they spend at least 4 to 6 h daily using technology for teaching-related tasks, occupying a substantial portion of their work and personal time.

Consequently, it is reasonable to speculate that the intensive use of technology directly, rather than indirectly, results in work–family conflicts. Furthermore, our study found that Technostress directly influences health issues among primary school teachers, such as visual fatigue, headaches, and sore shoulders. The higher the Technostress, the more frequent these symptoms arise. This aligns with previous findings that Technostress can lead to physical problems, including fatigue (Salanova et al., 2014) and insomnia (Porter and Kakabadse, 2006). To address these issues, we recommend schools invest in facilities or hire fitness professionals to help teachers alleviate fatigue and physical discomfort. For example, Latino et al. (2021) conducted a study on 40 teachers, finding that an eight-week yoga intervention resulted in statistically significant improvements in teachers' bodily and emotional awareness and prevention of professional burnout.

Fourthly, our study indicates that primary school teachers' technology intensity directly impacts their work–family conflicts and personal health and indirectly affects them through Technostress. These dual paths suggest that reducing technology intensity is one way to alleviate work–family conflicts and health issues for primary school teachers while addressing their Technostress is another viable approach. Notably, the indirect impact is more pronounced than the direct impact when primary school teachers receive higher levels of school support. In other words, teachers are more likely to experience work–family conflicts and health issues due to technology-induced psychological stress rather than prolonged hours of technology use. This finding contradicts Kyriacou and Chien (2004) conclusion that primary teachers considered the most effective stress-reduction strategy to be a simple decrease in workload. The discrepancy may stem from the nearly two-decade gap between the two studies or differences in research methods. Our conclusion is based on statistical analysis, while Kyriacou and Chien's restated teachers' opinions.

Once again, our results underscore the importance of supporting teachers during technological reforms through adequate measures that alleviate their perceived stress from technology use. For example, the announcement of administrative tasks could be confined to a fixed time frame rather than distributed randomly throughout the day. This change would allow teachers to focus more on teaching-related tasks and reduce the burden of multitasking. Moreover, schools must help teachers understand the explicit requirements of educational policies related to technology use (Kyriacou and Chien, 2004) so that they feel less pressured and better supported by such policies.

Lastly, our study found that school support moderates the indirect relationship between technology intensity, work–family conflicts, and health issues. As school support increases, the indirect impact of technology intensity on teachers' work–family conflicts and personal health becomes less apparent through the agency effect of Technostress. In other words, enhancing school support will likely reduce primary teachers' Technostress, a finding consistent with most previous studies' hypotheses (Wang et al., 2008; Salanova et al., 2014).

Our findings suggest that when primary school teachers have low technology intensity, perceived school support does not affect their Technostress. However, when the intensity level is high, greater perceived school support corresponds to less Technostress. Therefore, school leaders should provide technical support that facilitates effective learning and teachers' use of emerging technologies. Additionally, schools should offer timely comprehensive training to bridge the gap between teachers' willingness to integrate technology and their full capacity to integrate it (Liu, 2007). Moreover, Gaudioso et al. (2017) considered the lack of coping mechanisms a cause of Technostress; thus, schools should invite psychology experts to share knowledge about coping with upcoming or existing stress. In summary, our study highlights the importance of school support in mitigating the negative impacts of technology intensity on primary school teachers' work–family conflicts and health issues.

6.1 Implications

Given the above, the findings of this study highlight the significance of addressing Technostress among primary school teachers to enhance their well-being and support a conducive learning environment. Drawing upon the COR theory, several practical strategies can be employed by relevant stakeholders to mitigate Technostress and promote teacher well-being.

To address the Technostress experienced by teachers, school administrators, and education board officials should prioritize comprehensive technological training and support programs. These initiatives will empower teachers with the necessary skills to navigate

technology integration effectively, contributing to a sense of resource gain rather than loss. Tailored training, focusing on individual teachers' needs and challenges, will ensure that they build and maintain valuable resources (knowledge and skills) to cope with the demands of technology use.

Furthermore, fostering a supportive school culture, recognizing teachers' efforts, and promoting open communication can act as resources to buffer against Technostress. By providing social support and a sense of belonging, teachers can perceive an increase in resource availability, thereby reducing the impact of Technostress on their well-being. Peer support networks and mentorship programs can be valuable additions to create an environment of collaboration and resource exchange among teachers.

Considering the observed relationship between Technostress and work–family conflicts, it is essential to implement work-life balance initiatives. Reducing administrative burden and offering flexible scheduling options can replenish teachers' resources outside of their professional lives, mitigating the negative effects of Technostress on their personal well-being.

Moreover, acknowledging age and gender differences in Technostress experiences is crucial, especially for senior female headteachers who may be more susceptible to Technostress. Inclusive decision-making processes involving teachers of diverse backgrounds will ensure that technological policies consider varying needs. This approach gives teachers control over their resources, promoting a positive work environment.

Regular well-being assessments will aid stakeholders in monitoring teachers' Technostress levels and identifying areas of concern. These assessments will enable targeted interventions, such as resource enrichment programs and continuous professional development, to address specific stressors effectively.

Lastly, technology providers can reduce Technostress by collaborating with schools, gathering feedback from teachers, and promptly addressing usability issues. By involving teachers in product development and offering responsive customer support, technology providers enhance teachers' resource gain from using technology.

By implementing these measures collectively and accounting for the nuanced interplay of variables, such as age, gender, and seniority, school communities can empower teachers, minimize Technostress, and optimize the educational experience for teachers and students, leading to a healthier and more productive teaching and learning environment. Through the COR theory lens, these informed practices promote resource preservation and enhancement for primary school teachers, ultimately fostering a positive and supportive school culture.

6.2 Limitations

Firstly, the present study solely employed survey research, which is quantitative in nature, and the findings could have been further strengthened by integrating qualitative methods such as conducting in-depth interviews. Specifically, representative groups of teachers (such as those differentiated by gender and age) could have been interviewed to gain a more comprehensive understanding of the sources or triggers of Technostress. Secondly, it is important to consider that the participants were recruited via convenience sampling from two provinces in eastern China. Therefore, the results may not be generalizable to populations that differ significantly from those in our study. Thirdly, the participants were predominantly female teachers, accounting for approximately 80.3% of the total sample, while male teachers constituted only 19.7%. This noticeable gender imbalance could potentially impact the generalizability of our findings, especially concerning variations in Technostress experiences specific to different genders. However, our primary objective was not to directly compare the experiences of male and female teachers but rather to provide a comprehensive understanding of Technostress in the teaching profession. Fourthly, the variable "school support" was measured solely through self-reported subjective questions, and objective criteria were not used in its assessment. To further investigate the multifaceted effects of school support, future researchers could increase the number of related questions and expand its assessment criteria to include subjective and objective evaluations. Lastly, the Technostress level was measured after the Pandemic, so it is difficult to empirically conclude that teachers' Technostress increased solely due to the Pandemic. To gain a more nuanced understanding of the underlying causes of Technostress, future research could conduct longitudinal studies and measure teachers' Technostress at multiple time points under different circumstances.

Overall, it is important to acknowledge these limitations and for future researchers to address them to further contribute to the field of Technostress and its impact on primary school teachers.

7 Conclusion

Since the advent of the COVID-19 pandemic, teachers worldwide have faced a significant upsurge in Technostress due to the extensive use of online teaching and related technologies. This study, conducted through the lens of the Conservation of Resources (COR) theory, aimed to investigate primary school teachers' Technostress and its relationship with critical factors such as perceived school support, technology intensity, work–family conflicts, and personal health.

The findings of this study revealed that primary school teachers in China have been extensively utilizing technologies daily, resulting in a moderate to high level of Technostress. Notably, there were statistically significant differences based on gender, age, teaching years, and headteacher duties, underscoring the need for targeted support for senior female headteachers who were found to be more susceptible to Technostress.

The study further identified a positive and significant correlation between primary teachers' Technostress, work–family conflicts, and technology-induced health issues. Moreover, technology intensity was found to directly impact primary teachers' work–family conflicts and personal health, while school support played a moderating role. School support was observed to diminish the indirect impact of technology intensity on work–family conflicts and health issues, emphasizing the importance of a supportive school environment.

To mitigate the negative effects of technology use on teachers' well-being and teaching performance, policymakers and school administrators should prioritize measures to reduce the duration of technology use and ensure that teachers are regularly updated on emerging technologies. Special attention should be given to senior female headteachers, who may require tailored support to cope with the challenges of technology integration.

Additionally, providing psychological consultation services and opportunities for physical exercise can enable primary teachers to

effectively manage Technostress, minimize work–family conflicts, and enhance their personal well-being and physical health. By addressing these critical issues, this study underscores the need for targeted interventions and support mechanisms to promote teachers' well-being and teaching performance. Enhancing teacher preparation and professional development in the context of technology use will ultimately foster the sustainability of education for students and their families.

In conclusion, this study contributes to the ongoing discourse on technology integration in education and highlights the importance of understanding and addressing Technostress among primary school teachers. Through the insights gained from the COR theory, stakeholders can implement evidence-based practices that empower teachers, mitigate Technostress, and support the well-being of teachers in the changing landscape of education. These efforts are crucial in ensuring the quality and sustainability of education for the benefit of students and teachers alike.

Data availability statement

The dataset supporting the conclusions of this article will be made available by the authors, upon reasonable request.

Ethics statement

The studies involving humans were approved by Qingdao University Teacher's College Academic Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

ZW: Writing – original draft. LZ: Supervision, Writing – review & editing. XW: Data curation, Methodology, Writing – original draft. LL: Formal analysis, Writing – original draft. CL: Conceptualization, Resources, Writing – review & editing.

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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.

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References

Aktan, O., and Toraman, Ç. (2022). The relationship between technostress levels and teachers' job satisfaction within the Covid-19 period. *Educ. Inf. Technol.* 27, 10429–10453. doi: 10.1007/s10639-022-11027-2

Altınay-Gazi, Z., and Altınay-Aksal, F. (2017). Technology as a mediation tool for improving the teaching profession in higher education practices. *EURASIA J. Math. Sci. Technol. Educ.* 13, 803–813. doi: 10.12973/eurasia.2017.00644a

Argyriou, A., and Iordanidis, G. (2014). Management and administration issues in Greek secondary schools: self-evaluation of the head teacher role. *Educ. Res. Int.* 2014, 1–11. doi: 10.1155/2014/147310

Atteh, E., Martin, G., Oduro, A. T., Mensah, F. A., and Gyamfi, R. (2020). An overview of the influence of work-family life conflict among female teachers and their job satisfaction in schools. *Asian J. Educ. Soc. Stud.* 9, 48–58. doi: 10.9734/ajess/2020/v9i230245

Briner, R., and Dewberry, C. (2007). *Staff well-being is key to school success: A research study into the links between staff well-being and school performance*. London: Worklife Support.

Brod, C. (1984). *Technostress: The human cost of the computer revolution*. Boston: Reading, Mass: Addison-Wesley.

Cadwalladr, C., and Graham-Harrison, E. (2018). Revealed: 50 million Facebook profiles harvested for Cambridge Analytica in major data breach. *The guardian* 17:22.

Califf, C. B., Sarker, S., and Sarker, S. (2020). The bright and dark sides of technostress: a mixed-methods study involving healthcare IT. *MIS Q.* 44, 809–856. doi: 10.25300/MISQ/2020/14818

Carlson, D. S., Kacmar, K. M., and Williams, L. J. (2000). Construction and initial validation of a multidimensional measure of work–family conflict. *J. Vocat. Behav.* 56, 249–276. doi: 10.1006/jvbe.1999.1713

Cerrato, J., and Cifre, E. (2018). Gender inequality in household chores and work-family conflicts. *Front. Psychol.* 9:1330. doi: 10.3389/fpsyg.2018.01330

Chaplain, R. P. (2001). Stress and job satisfaction among primary headteachers: A question of balance? *Educational Management and Administration* 29, 197–215.

Dong, Y., Xu, C., Chai, C. S., and Zhai, X. (2020). Exploring the structural relationship among teachers' technostress, technological pedagogical content knowledge (TPACK), computer self-efficacy, and school support. *Asia Pac. Educ. Res.* 29, 147–157. doi: 10.1007/s40299-019-00461-5

Dussault, M., and Deaudelin, C. (1999). Professional isolation and occupational stress in teachers. *Psychol. Rep.* 84, 943–946. doi: 10.2466/pr0.1999.84.3.943

Ernst Kossek, E., and Ozeki, C. (1998). Work–family conflict, policies, and the job–life satisfaction relationship: a review and directions for organizational behavior–human resources research. *J. Appl. Psychol.* 83, 139–149. doi: 10.1037/0021-9010.83.2.139

Field, A. (2000). *Discovering statistics using spss for windows*. London-Thousand Oaks, New Delhi: Sage publications.

Fullan, M. (2001). *The new meaning of educational change*. New York: Teachers College.

Gaffney, H., Ttofi, M. M., and Farrington, D. P. (2019). Evaluating the effectiveness of school-bullying prevention programs: an updated meta-analytical review. *Aggress. Violent Behav.* 45, 111–133. doi: 10.1016/j.avb.2018.07.001

Gaudioso, F., Turel, O., and Galimberti, C. (2017). The mediating roles of strain facets and coping strategies in translating techno-stressors into adverse job outcomes. *Comput. Hum. Behav.* 69, 189–196. doi: 10.1016/j.chb.2016.12.041

Golembiewski, R. T., Munzenrider, R., and Carter, D. (1983). Phases of progressive burnout and their work site covariants: critical issues in OD research and praxis. *J. Appl. Behav. Sci.* 19, 461–481. doi: 10.1177/002188638301900408

Graham, C. R. (2011). Theoretical considerations for understanding technological pedagogical content knowledge (TPACK). *Comput. Educ.* 57, 1953–1960. doi: 10.1016/j.compedu.2011.04.010

Gravetter, F., and Wallnau, L. (2014). *Essentials of statistics for the behavioral sciences* (*8th ed.*). Belmont, CA: Wadsworth.

Grenville-Cleave, B., and Boniwell, I. (2012). Surviving or thriving? Do teachers have lower perceived control and well-being than other professions? *Manag. Educ.* 26, 3–5. doi: 10.1177/0892020611429252

Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Sch. Psychol.* 43, 495–513. doi: 10.1016/j.jsp.2005.11.001

Harding, S., Morris, R., Gunnell, D., Ford, T., Hollingworth, W., Tilling, K., et al. (2019). Is teachers' mental health and wellbeing associated with students' mental health and wellbeing? *J. Affect. Disord.* 242, 180–187. doi: 10.1016/j.jad.2018.08.080

Hassan, N., Yaakob, S. A., Mat Halif, M., Abdul Aziz, R., Abdul Majid, A., and Sumardi, N. A. (2018). The effects of technostress creators and organizational commitment among school teachers. *Int. Conferen. Univ. Learn. Teach. (InCULT)* 2018, 1–11.

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513

Hsiao, K. L. (2017). Compulsive mobile application usage and technostress: the role of personality traits. *Online Inf. Rev.* 41, 272–295. doi: 10.1108/OIR-03-2016-0091

Huang, Y. H., Hammer, L. B., Neal, M. B., and Perrin, N. A. (2004). The relationship between work-to-family conflict and family-to-work conflict: a longitudinal study. *J. Fam. Econ. Iss.* 25, 79–100. doi: 10.1023/B:JEEI.0000016724.76936.a1

Jena, R. K. (2015). Technostress in ICT enabled collaborative learning environment: an empirical study among Indian academician. *Comput. Hum. Behav.* 51, 1116–1123. doi: 10.1016/j.chb.2015.03.020

Joo, Y. J., Lim, K. Y., and Kim, N. H. (2016). The effects of secondary teachers' technostress on the intention to use technology in South Korea. *Comput. Educ.* 95, 114–122. doi: 10.1016/j.compedu.2015.12.004

Jung, I., Kudo, M., and Choi, S. K. (2012). Stress in Japanese learners engaged in online collaborative learning in English. *BJET* 43, 1016–1029. doi: 10.1111/j.1467-8535.2011.01271.x

Khlaif, Z. N., Sanmugam, M., and Ayyoub, A. (2022). Impact of technostress on continuance intentions to use mobile technology. *Asia Pac. Educ. Res.* 32, 151–162. doi: 10.1007/s40299-021-00638-x

Khuntia, J., Tanner, M., and Weiner, J. (2015). Juggling digitization and technostress: the case of alert fatigue in the implementation of the patient care system. *Heal. Policy Technol.* 4, 364–377. doi: 10.1016/j.hlpt.2015.08.005

Kovess-Masféty, V., Sevilla-Dedieu, C., Rios-Seidel, C., Nerrière, E., and Chan Chee, C. (2006). Do teachers have more health problems? Results from a French cross-sectional survey. *BMC Public Health* 6, 1–13. doi: 10.1186/1471-2458-6-101

Kyriacou, C., and Chien, P. Y. (2004). Teacher stress in Taiwanese primary schools. *J. Educ. Enquiry* 5, 86–104.

Lam, S. F., Cheng, R. W. Y., and Choy, H. C. (2010). School support and teacher motivation to implement project-based learning. *Learn. Instr.* 20, 487–497. doi: 10.1016/j.learninstruc.2009.07.003

Latino, F., Cataldi, S., and Fischetti, F. (2021). Effects of an 8-week yoga-based physical exercise intervention on teachers' burnout. *Sustain. For.* 13:2104. doi: 10.3390/su13042104

Li, L., and Wang, X. (2021). Technostress inhibitors and creators and their impacts on university teachers' work performance in higher education. *Cogn. Technol.Work* 23, 315–330. doi: 10.1007/s10111-020-00625-0

Liu, T. C. (2007). Teaching in a wireless learning environment: a case study. *J. Educ. Technol. Soc.* 10, 107–123.

Magistra, S. N., Santosa, S., and Indriayu, M. (2021). Effect of self-efficacy and technostress on teacher performance through organizational commitments. *Dinamika Pendidikan* 16, 75–82. doi: 10.15294/dp.v16i1.28993

Mahdi, H. S., and Al-Dera, A. S. A. (2013). The impact of teachers' age, gender, and experience on using information and communication technology in EFL teaching. *Engl. Lang. Teach.* 6, 57–67. doi: 10.5539/elt.v6n6p57

Marchiori, D. M., Mainardes, E. W., and Rodrigues, R. G. (2019). Do individual characteristics influence the types of technostress reported by workers? *Int. J. Hum. Comput. Interact.* 35, 218–230. doi: 10.1080/10447318.2

Mark, G., Gudith, D., and Klocke, U. (2008). The cost of interrupted work: more speed and stress. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 107–110).

McLean, L., Janssen, J., Espinoza, P., Johnson, S., and Jimenez, M. (2023). Associations between teacher and student mathematics, science, and literacy anxiety in fourth grade. *J. Educ. Psychol.* 115, 539–551. doi: 10.1037/edu0000790

Mushtaque, I., Rizwan, M., Dasti, R. K., Ahmad, R., and Mushtaq, M. (2021). Student's attitude and impact of online learning: the role of teachers and classmate support during the Covid-19 crisis. *Perform. Improv.* 60, 20–27. doi: 10.1002/pfi.21982

Ong, C. S., and Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Comput. Hum. Behav.* 22, 816–829. doi: 10.1016/j.chb.2004.03.006

Patel, R., Babady, E., Theel, E. S., Storch, G. A., Pinsky, B. A., and George, K. S. (2020). Value of diagnostic testing for SARS-CoV-2/COVID-19. *Am Soc Microbiol* 11, e00722–e00720. doi: 10.1128/mbio.00722-20

Penado-Abilleira, M., Rodicio-García, M. L., Ríos-de-Deus, M. P., and Mosquera-González, M. J. (2020). Technostress in Spanish university students: validation of a measurement scale. *Front. Psychol.* 11:582317. doi: 10.3389/fpsyg.2020.582317

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903.

Porter, G., and Kakabadse, N. K. (2006). HRM perspectives on addiction to technology and work. *J. Manag. Dev.* 25, 535–560. doi: 10.1108/02621710610670119

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., and Tu, Q. (2008). The consequences of technostress for end users in organizations: conceptual development and empirical validation. *Inf. Syst. Res.* 19, 417–433. doi: 10.1287/isre.1070.0165

Rasmitadila, R., Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., et al. (2020). The perceptions of primary school teachers of online learning during the COVID-19 pandemic period. *J. Ethnic Cult. Stud.* 7, 90–109. doi: 10.29333/ejecs/388

Rey-Merchán, M. D. C., and López-Arquillos, A. (2022). Occupational risk of technostress related to the use of ICT among teachers in Spain. *Sustain. For.* 14:8746. doi: 10.3390/su14148746

Rohwer, E., Flöther, J. C., Harth, V., and Mache, S. (2022). Overcoming the "dark side" of technology—a scoping review on preventing and coping with work-related technostress. *Int. J. Environ. Res. Public Health* 19:3625. doi: 10.3390/ijerph19063625

Russell, M., Bebell, D., O'Dwyer, L., and O'Connor, K. (2003). Examining teacher technology use: implications for preservice and in-service teacher preparation. *J. Teach. Educ.* 54, 297–310. doi: 10.1177/0022487103255985

Sahu, M., Gandhi, S., and Sharma, M. K. (2019). Mobile phone addiction among children and adolescents: a systematic review. *J. Addict. Nurs.* 30, 261–268. doi: 10.1097/JAN.0000000000000309

Salanova, M., Llorens, S., and Ventura, M. (2014). "Technostress: the dark side of technologies," In *The impact of ICT on quality of working life.* eds. C. Korunka and P. Hoonakker (Dordrecht: Springer Netherlands), 87–103.

Schildkamp, K., Wopereis, I., Kat-De Jong, M., Peet, A., and Hoetjes, I. (2020). Building blocks of instructor professional development for innovative ICT use during a pandemic. *J. Professional Capital Commun.* 5, 281–293. doi: 10.1108/JPCC-06-2020-0034

Scott, S., Limbert, C., and Sykes, P. (2021). Work-related stress among headteachers in Wales: prevalence, sources, and solutions. *Educ. Manag. Admin. Leadership* 17411432211054630:174114322110546. doi: 10.1177/17411432211054630

Shah, M. M., Hassan, R., and Embi, R. (2012). Technology acceptance and computer anxiety. *2012 international conference on innovation management and technology research* (pp. 306–309). IEEE.

Shigemura, J., Ursano, R. J., Morganstein, J. C., Kurosawa, M., and Benedek, D. M. (2020). Public responses to Japan's novel 2019 coronavirus (2019-nCoV): mental health consequences and target populations. *Psychiatry Clin. Neurosci.* 74, 281–282. doi: 10.1111/pcn.12988

Siu, N. Y., and Lam, K. C. J. (2009). A comparative study of ethical perceptions of managers and non-managers. *J. Bus. Ethics* 88, 167–183. doi: 10.1007/s10551-008-9824-y

Stockwell, G., and Wang, Y. (2023). Exploring the challenges of technology in language teaching in the aftermath of the pandemic. *RELC J.* 54, 474–482. doi: 10.1177/00336882231168438

Syvänen, A., Mäkiniemi, J. P., Syrjä, S., Heikkilä-Tammi, K., and Viteli, J. (2016). When does the educational use of ICT become a source of technostress for Finnish teachers? *Seminar Net* 12, 95–109. doi: 10.7577/seminar.2281

Tang, D., and Wen, Z. (2020). Statistical approaches for testing common method bias: Problems and suggestions. *J. Psycholo. Sci.* 43, 215–223. doi: 10.16719/j.cnki.1671-6981.20200130

Tarafdar, M., Pullins, E. B., and Ragu-Nathan, T. (2015). Technostress: negative effect on performance and possible mitigations. *Inf. Syst.* 25, 103–132. doi: 10.1111/isj.12042

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., and Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *J. Manag. Inf. Syst.* 24, 301–328. doi: 10.2753/MIS0742-1222240109

Tarus, J. K., Gichoya, D., and Muumbo, A. (2015). Challenges of implementing e-learning in Kenya: a case of Kenyan public universities. *Int. Rev. Res. Open Distribut. Learn.* 16, 120–141. doi: 10.19173/irrodl.v16i1.1816

Ursavaş, Ö. F., McIlroy, D., and Şahin, S. (2011). Computer phobia in higher education: a comparative analysis of United Kingdom and Turkish university students. *Gaziantep University J. Soc. Sci.* 10, 1271–1290.

Uzair, Z., and Bhaumik, A. (2023). The relationship between teachers' emotional intelligence, job stress on job performance in higher education institutions in the

United Arab Emirates during the Covid-19 pandemic. *SAR J.*, 28–36. doi: 10.18421/sar61-05

Voet, M., and De Wever, B. (2017). Towards a differentiated and domain-specific view of educational technology: an exploratory study of history teachers' technology use. *Br. J. Educ. Technol.* 48, 1402–1413. doi: 10.1111/bjet.12493

Wang, Z., Pang, H., Zhou, J., Ma, Y., and Wang, Z. (2021). "What if… it never ends?": examining challenges in primary teachers' experience during the wholly online teaching. *J. Educ. Res.* 114, 89–103. doi: 10.1080/00220671.2021.1884823

Wang, K., Shu, Q., and Tu, Q. (2008). Technostress under different organizational environments: an empirical investigation. *Comput. Hum. Behav.* 24, 3002–3013. doi: 10.1016/j.chb.2008.05.007

Yau, H. K., and Cheng, A. L. F. (2012). Gender difference of confidence in using technology for learning. *J. Technol. Stud.* 38, 74–79. doi: 10.21061/jots.v38i2.a.2

Zhang, R., Lu, Y., and Du, H. (2022). Vulnerability and resilience in the wake of COVID-19: family resources and children's well-being in China. *Chinese Sociolog. Rev.* 54, 27–61. doi: 10.1080/21620555.2021.1913721

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Psychological well-being of teachers: influence of burnout, personality, and psychosocial climate

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Introduction: Those who are professionally dedicated to teaching can be exposed with their work to situations that influence their perception of psychological well-being. This study aims to evaluate how the factors of personality, emotional intelligence, burnout and the psychosocial climate derived from the work environment of teachers influence their levels of psychological well-being, to verify whether these variables allow us to establish a predictive model of psychological well-being by means of multiple regression analysis.

Methods: Participants were a group of 386 teachers in early childhood, Primary and Secondary education, both in training and in active service (71.5% women; 28.5% men). A correlation and multiple regression analysis were performed to establish a predictive model of psychological well-being. We used 5 instruments: Psychosocial Climate at Work Scales (ECPT); verall Personality Assessment Scale (OPERAS); Questionnaire for Evaluation of Burnout Syndrome at Work (CESQT); Spanish adaptation of the Riff Psychological Well-being Scales (EBP) and Spanish validation of the Trait Meta-Mood Scale (TMMS-24).

Results: Most of the relationships were significant, and the multiple regression analysis explains 58.5% of the global variance of psychological well-being in teachers, being emotional stability the most relevant and main predictor of psychological well-being, explaining its 38.1%.

Discussion: Personality shows a great influence in psychological well-being of teachers, particularly emotional stability. The ability to establish predictive models to explain psychological well-being in educational environments is confirmed.

KEYWORDS

psychological well-being, burnout, psychological climate, teachers, personality

1 Introduction

Well-being arises from the mediation between health and sickness and is determined by environmental variables, which are regulated by personality (Gale et al., 2013). It can be hedonic, which is characterized by positive affection and the lack of negative affection, or eudaimonic or psychological, which involves the complete psychological functioning of the individual and develops all of their capacities (Millán et al., 2017). Some authors associate the term "psychological well-being" with happiness, satisfaction, subjective well-being, and quality of life (Sánchez-Vidal, 2017; Muñoz-Campos et al., 2018; Lucas-Mangas, 2020).

In recent years, one of the most promising lines of research on work and the mental health of teachers has been the search for explanatory models of well-being based on psychological aspects of work (Aguirre et al., 2020; Orozco et al., 2020). The psychological well-being of these professionals has been shown to be closely related to positive affection, satisfaction, professional success, and good interpersonal relations (Lima and Lerrechea, 2013; Luhmann et al., 2013); high levels of emotional intelligence (Sánchez-Teruel and Robles-Bello, 2018; Aparisi et al., 2019); and person–environment adjustment and perceived social support (Lorente et al., 2008; Martínez, 2020). In this sense, emotional intelligence allows the identification and expression of emotions in an appropriate way, facilitating the understanding and reasoning of one's own emotions and those of others (Mayer et al., 2000).

In this context, people's individual resources are one significant element of the construct of well-being that reflects the extent to which they feel that their life is good (Rodríguez-Carvajal et al., 2010). Some authors suggest that one of the main predictors of well-being is personality (Aghababaei and Arji, 2014). However, in organizations, several intertwined variables intervene (Delhom et al., 2019), that can have a positive or negative effect on individuals and, therefore, influence their well-being (Adina and Clipa, 2012).

For this reason, determining the extent to which personal factors and psychological factors of the work environment influence well-being has been controversial: Individual characteristics may affect how people perceive the psychosocial environment at work and consequentially determine their reactions (Díaz-Pincheira and Carrasco-Garcés, 2018) because the psychological environment at work can affect the worker's well-being, and physical, psychological, and social health (Magnano et al., 2020).

Several studies have addressed this issue, and they confirm that psychological well-being is affected by stressful conditions at work which, if maintained over a long period, can cause emotional discomfort and dissatisfaction which, in turn, lead to burnout (Gil-Monte, 2011; Fiorilli et al., 2019). Burnout is "a process that develops progressively due to the use of poorly functional coping strategies with which professionals try to protect themselves from work stress generated by their relationships with the organization's clients and, to a lesser extent by their relationships with the organization" (Gil-Monte, 2011, p. 13).

In this regard, Gale et al. (2013) and Larsen (2000) argued that low scores on neuroticism and high scores on extraversion tend to report greater well-being. Since they are related to behaviors associated with psychological well-being, such as occupational achievement and the degree of participation in the community, in this sense, also agreeableness and responsibility are related to greater emotional regulation in terms of interpersonal relationships and adjustment at work. Espinoza-Díaz et al. (2015) working on the same lines found that both personality factors and psychosocial environment greatly influence teachers' well-being and that disorganization and emotional stability can cause the emergence of burnout syndrome, which affects levels of experienced well-being. In this study, also was found the personality component considered most relevant is "emotional stability."

Individual differences due to personality play an important role in the evaluation of experienced well-being since individuals can react to the same situation in different ways even though they have the same job. Similarly, personality can moderate how individuals perceive the psychosocial climate at work, definido como se refiere a las condiciones del entorno laboral que pueden afectar el bienestar y la salud de los trabajadores y están directamente relacionadas con la organización en cualquiera de sus tres aspectos: físico, social o psíquico (Tous-Pallarès et al., 2011), that can generate stress (Unda et al., 2016).

Some studies specifically associate emotional stability and extraversion factors with the proneness of experiencing positive and negative emotions, respectively (Diener and Lucas, 1999; Chico, 2000). In this respect, personality benefits psychological well-being in environmental situations that can cause stress and burnout (Durán et al., 2006; Gil-Monte et al., 2009; Queirós et al., 2013), and in turn, this represents a resource that allows identifying the use of different coping strategies (Valdivieso-León et al., 2020).

Therefore, we aimed to evaluate the relationship between personality factors, psychosocial work climate, emotional intelligence, and burnout, on the one hand, the psychological well-being of a group of teachers, on the other hand, determine the extent to which these variables can be used to create a predictive model of psychological well-being using multiple regression analysis. Personality factors are thought to have a special influence on the perception of the psychosocial climate leading to burnout and on the person–environment adjustment that favors a greater sense of well-being experienced by teachers (Moreno-Jiménez et al., 2012; Merino-Tejedor and Lucas-Mangas, 2016; Soler et al., 2016; De la Fuente et al., 2020).

2 Materials and methods

2.1 Participants

The participants in the study were 386, both in training and in active service, of whom, 71.5% were women and 28.5% were men, aged between 18 and 64 years ($\bar{x} = 31$; SD = 10.94). The study was carried out with a non-probabilistic sample, the response rate of which was 99%. The teachers were working in early childhood (23.6%), primary (42.5%), and secondary (33.9%) education, and 76.7% of them were full-time, 11.1% were part-time, and 9.3% were employed by the hour. The remaining 2.8% did not report information in this regard.

2.2 Instruments

In order to ensure that the variables being studied were operative, the following five instruments were used:

- Scales of Psychosocial Climate at Work (ECPT) by Tous-Pallarès et al. (2011). This brief questionnaire diagnoses the psychosocial factors that workers perceive as negative or positive in their organizations. It consists of 16 items and three scales: work content (WC; $\alpha = 0.95$), personal relationships (PR $\alpha = 0.90$), and role definition (disorganization) (DR; $\alpha = 0.89$).
- Overall Personality Assessment Scale (OPERAS) by Vigil-Colet et al. (2013). This is a 40-item scale based on the model of the five personality factors, and the scores provided are free from the effects of acquiescence and social desirability. The factorial

reliability of the scales is the following: extraversion (EX; α = 0.86), responsibility (RE; α = 0.77), emotional stability (ES; α = 0.86), kindness (K; α = 0.71), and openness to experience (OE; α = 0.81).

- Questionnaire for the Evaluation of Burnout Syndrome at Work (CESQT) by Gil-Monte (2011). This questionnaire evaluates cognitions, emotions, and attitudes related to work experiences. It consists of 20 items and covers four dimensions: illusion for work (IW; α = 0.90), mental exhaustion (ME; α = 0.85), indolence (IN; α = 0.74), guilt (G; α = 0.82), as well as a general burnout scale (GBS; α = 0.85).
- Spanish adaptation of Riff's Psychological Well-being Scales (EBP) by Díaz et al. (2006). This is a reduced scale of 29 items, which measures six dimensions of psychological well-being: self-acceptance (SA; α = 0.84), positive relationships (PR; α = 0.78), autonomy (AT; α = 0.70), domain of the environment (DE; α = 0.82), purpose in life (PL; α = 0.70), and personal growth (PG; α = 0.71).
- Spanish validation of the Trait Meta-Mood Scale-24 (TMMS-24) by Fernández-Berrocal et al. (2004). This is a scale of 24 items and three emotional intelligence dimensions: attention (AT; α = 0.90), clarity (CL; α = 0.90), and emotional repair (ER; α = 0.86).

2.3 Procedure

We contacted the Ministry of Education of Catalunya to arrange a meeting with the directors of the schools in the region so that we could explain the project, sign agreements with those schools interested (a total of 5), and subsequently apply the battery of tests to their teachers. They were provided with information on the objectives of the psychosocial evaluation, with particular emphasis on the importance of giving honest answers to the questionnaires. Similarly, they were told that the agreement with the school included a confidentiality agreement that ensured that the information provided would be properly processed and used. This was explained on the forms used to administer the tests.

The test was administered through a web platform hosted on our laboratory servers. Our team contacted the participants, and we spread the link through which they could access the platform hosting the test, where they could leave their answers. The tests were administered on Spanish language. The platform had a filter that guaranteed that the participants voluntarily agreed to be part of the study, without any type of coercion or financial remuneration, and participants also stated that they had been informed that the administration of the scale was completely anonymous and governed by the Data Protection Act.

The research was also authorized by the Ethics Committee of University of Rovira i Virgilli with protocol code CEIPSA-2021-PR-0056.

2.4 Data analysis

The test scores were collected in a database with the program SPSS version 26, and subsequently, a correlation and multiple regression analysis was performed in successive steps in order to establish the influence of the study variables and the relationship between them.

3 Results

The results showed that most of the relationships obtained from the study were significant. It can be seen in Table 1 that the variables analyzed—except the professional life stage—show substantial relationships with the measures of psychological well-being. However, the relationship was greater between personality measures and the total sum of psychological well-being, especially emotional stability ($r = 0.617$; $p < 0.01$), and to a lesser extent, the relationships obtained with emotional intelligence are also remarkable in their emotional repair scale ($r = 0.523$; $p < 0.01$), with the total burnout scale ($r = -0.498$; $p < 0.01$) and with psychosocial climate with their personal relationships scale ($r = 0.379$; $p < 0.01$).

These results indicate that emotional stability is the personality factor that influences psychological well-being of teachers the most, especially self-acceptance and domain of the environment. However, the emotional repair scale is also noteworthy on self-acceptance and personal growth. The total burnout scale had the most effect on positive relationships and the domain of the environment. The psychosocial climate scale intervenes in the ability to establish positive relationships and the purpose of life. Therefore, teachers with greater emotional stability, who are able to repair their emotions and who perceive good personal relationships in their work environment minimize the effects of burnout. This enables them to master the environment and interact in a positive way, which in turn influences their psychological well-being.

The next step consisted of carrying out a series of multiple regressions in successive steps to establish a predictive model of the psychological well-being of teachers. In these analyses, the total score of psychological well-being and the scores of the scales that make it up were used as criteria as were the scores of the predictive scales psychosocial climate, personality, emotional intelligence, and burnout, and the variable stage of professional life.

Table 2 shows the results obtained from the analysis. The best predictor of the total scale of psychological well-being is emotional stability, which explains more than 38% of the variance and, with the personality factors, a total of 40.4%. The dimensions of burnout, especially its total scale, increase by 8.7%, while emotional intelligence in its dimension of emotional clarity contributes a total of 6%. The psychosocial climate with its scale of personal relationships increases by 1.3%, making the total variance explained by the model a total of 58.5%. It should be pointed out that the stage of professional life variable did not enter the model at any time.

In the results obtained for each of the psychological well-being scales, the highest percentage of variance is constantly explained by emotional stability or burnout. The proposed model explains 44.9% of the variance of self-acceptance, 33.4% of positive relationships, 29.7% of personal autonomy, 46.5% of the domain of the environment, 27.5% of personal growth, and 43.6% of the purpose in life (see Table 3).

These results show that personality factors, and particularly emotional stability, have the greatest power to predict psychological well-being in teachers although burnout scales, together with,

TABLE 1 Pearson correlations between the variables of psychosocial climate, personality, emotional intelligence, professional life stage, and burnout with the psychological well-being of teachers.

Pearson correlations	SA	PR	AT	DE	PG	PL	TPW
Psychosocial climate							
Job content	**0.253**	**0.211**	*0.107*	**0.331**	**0.150**	**0.277**	**0.297**
Personal relationships	**0.327**	**0.351**	*0.105*	**0.315**	**0.248**	**0.347**	**0.379**
Definition of role (disorganization)	**−0.168**	**−0.225**	−0.046	**−0.276**	**−0.147**	**−0.190**	**−0.239**
Personality							
Extraversion	**0.330**	**0.362**	**0.251**	**0.256**	**0.171**	**0.304**	**0.370**
Emotional stability	**0.603**	**0.431**	**0.426**	**0.526**	**0.333**	**0.511**	**0.617**
Responsibility	**0.209**	**0.161**	0.097	**0.274**	**0.228**	**0.318**	**0.288**
Kindness	**0.272**	**0.291**	0.095	**0.288**	**0.264**	**0.217**	**0.319**
Openness to experience	**0.206**	**0.174**	**0.193**	**0.267**	**0.294**	**0.240**	**0.294**
Emotional intelligence							
Emotional attention	**−0.165**	0.061	**−0.251**	*−0.127*	0.076	−0.029	−0.087
Emotional clarity	**0.383**	**0.291**	**0.280**	**0.399**	**0.337**	**0.426**	**0.455**
Emotional repair	**0.535**	**0.320**	**0.328**	**0.371**	**0.412**	**0.421**	**0.523**
Burnout							
Illusion for Work	**0.302**	**0.390**	*0.119*	**0.333**	**0.347**	**0.374**	**0.414**
Psychological tiredness	**−0.259**	**−0.348**	**−0.184**	**−0.330**	**−0.179**	**−0.275**	**−0.356**
Indolence, cynicism	**−0.265**	**−0.301**	**−0.221**	**−0.377**	**−0.256**	**−0.292**	**−0.376**
Guilt	**−0.248**	**−0.240**	**−0.260**	**−0.315**	**−0.205**	**−0.256**	**−0.328**
Burnout total scale	**−0.359**	**−0.454**	**−0.232**	**−0.454**	**−0.330**	**−0.406**	**−0.498**
Professional life stage	0.035	*−0.114*	*0.107*	0.057	−0.034	0.018	0.002

Significant values: $p < 0.01$ in **bold**, $p < 0.05$ in *italics*; SA, self-acceptance; PR, positive relationships; AT, autonomy; DE, domain of environment; PG, personal growth; PL, purpose in life; TPW, total psychological well-being.

emotional intelligence and psychosocial climate, also play a fundamental role in increasing this predictive capacity.

4 Discussion

This study shows important relationships between personality factors and all dimensions of psychological well-being, especially emotional stability ($r = 0.617$; $p < 0.01$) and extraversion ($r = 0.370$; $p <.01$), similar to study by Rakesh (2011) who finds a similar relationship between emotional stability ($r = 0.490$; $p < 0.01$) and extraversion ($r = 0.260$; $p < 0.01$). Both studies coincide with those by other authors who show the same relationship (Chico, 2000; Gale et al., 2013) as well as significant relationships between all the personality factors and satisfaction and psychological well-being (Delhom et al., 2019).

For its part, each of the scales of psychosocial climate, especially personal relationships ($r = 0.379$; $p < 0.01$), presents a high correlation with psychological well-being. Faragher et al. (2005) found values ranging from ($r = 0.235$; $p < 0.01$) to ($r = -0.287$; $p < 0.01$) when they correlated job satisfaction with personal relationships. Similarly, the emotional intelligence scales of emotional clarity and repair also show a high correlation with psychological well-being scales. This result is similar to that obtained by Adina and Clipa (2012) when they correlated emotional intelligence with positive attitudes at work ($r = 0.417$; $p < 0.01$), job satisfaction ($r = 0.255$; $p < 0.01$), and general satisfaction in life ($r = 0.229$; $p < 0.01$).

High correlations ($r = 0.328$ to $r = 0.498$) are observed between burnout and all scales of psychological well-being. This result concurs with that of Faragher et al. (2005), who correlated job satisfaction and burnout with similar results ($r = 0.409$ to $r = 0.478$).

Moreover, the results of the multiple regression analysis show that all the personality factors together explain 40.4% of the psychological well-being of teachers. However, the model shows that emotional stability is the main predictor of psychological well-being, explaining 38.1% of its variance, in agreement with Chico (2000), who found that emotional stability explained 44% of psychological well-being, and Rakesh (2011), who found that personality factors explained 21%. Second, as can be seen in Figure 1, the model introduces the total burnout scale, which explains 8.1% of the total variance in psychological well-being. This result is similar to that of Durán et al. (2006), who explain 8.2% of satisfaction with burnout and emotional fatigue, and Queirós et al. (2013), who explain 11.4%. Third, emotional intelligence contributes 8.6% to the total variance of the psychological well-being of teachers. In this case, it is interesting to note that the result coincides with the conclusions of study by Aguirre et al. (2020) that when personality is taken into account, emotional intelligence predicts only a small variation in satisfaction and provides much less information than personality factors.

TABLE 2 Predictive model successive steps of the psychological well-being of teachers through the analysis of personality factors, psychosocial climate, emotional intelligence, professional life stage, and burnout.

Regression analysis	SA		RL		AT		DE		PG		PL	
	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β
Psychosocial climate												
Job content	–	–	–	–	–	–	0.022	0.147	–	–	–	–
Personal relationships	0.019	0.139	0.029	0.150	-	-	-	-	-	-	0.010	0.126
Definition of role (disorganization)	–	–	–	–	–	–	–	–	–	–	–	–
Personality												
Extraversion	0.006	0.090	0.021	0.142	0.013	0.126	–	–	–	–	–	–
Emotional stability	0.364	0.402	0.078	0.194	0.181	0.251	0.227	0.247	0.020	0.140	0.261	0.327
Responsibility	–	–	–	–	–	–	0.009	0.106	–	–	0.025	0.155
Kindness	–	–	–	–	0.014	−0.138	–	–	–	–	0.009	−0.107
Openness to experience	–	–	–	–	0.012	0.114	0.015	0.106	0.045	0.192	–	–
Emotional intelligence												
Emotional attention	0.009	−0.120	–	–	0.022	−0.246	0.010	−0.119	–	–	–	–
Emotional clarity	0.036	0.208	0.010	0.108	0.038	0.197	0.048	0.251	0.080	0.216	0.072	0.249
Emotional repair	–	–	–	–	–	–	–	–	–	–	–	–
Burnout												
Illusion for work	–	–	–	–	–	–	–	–	0.120	0.205	0.047	0.134
Psychological tiredness	–	–	–	–	–	–	–	–	–	–	–	–
Indolence, cynicism	0.015	−0.118	–	–	0.016	−0.148	0.008	−0.136	0.010	−0.111	0.013	−0.146
Guilt	–	–	–	–	–	–	–	–	–	–	–	–
Burnout total scale	–	–	0.206	−0.275	–	–	0.076	−0.139	–	–	–	–
Professional life stage	–	–	–	–	–	–	–	–	–	–	–	–
Explained variance	**44.9**		**33.4**		**29.7**		**46.5**		**27.5**		**43.6**	

$p < 0.01$; SA, self acceptance; RL, positive relationships; AT, autonomy; DE, domain of environment; PG, personal growth; PV, purpose in life. Bold aims to highlight the variance explained.

5 Conclusion

As a result of the observed results, we can conclude that the presence of burnout in teachers is mainly related to the perception of disorganization in the work environment, which influences the decrease in enthusiasm for it. However, it is also observed that in those teachers who are exposed to burnout but who present greater emotional stability and kindness, it is more likely that it does not affect them; that is, the stress derived from work favors the presence of burnout, and it is experienced by the individual. Therefore, it can only be explained with context and personality variables (Moreno-Jiménez et al., 2006, 2012). Therefore, we can affirm that the main predictor of burnout in teachers is the perception of disorganization in the work environment; however, the mediating role played by personality is undeniable, especially emotional stability and extraversion, since both contribute to a greater emotional clarity and ability to repair, Therefore, the most emotionally stable and extroverted teachers minimize the negative effects of environmental factors, decreasing to a certain extent the burnout experience they face, since, as Chico (2000) affirms, people assess quality of their lives according to their own personal criteria.

Therefore, it can be affirmed that psychological well-being is influenced by personality (particularly by emotional stability); however, emotional intelligence and SQT also present a relevant relationship. However, the emotional stability personality factor is the main predictor of psychological well-being and the use of measures of SQT, psychosocial climate, and EI increase the predictive capacity of the model, and the joint use of measures of psychosocial climate and personality improves the ability to establish predictive models that allow the prevention of burnout as well as improve psychological well-being in educational environments with respect to models that focus exclusively on environmental variables or on individual variables.

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TABLE 3 Predictive model successive steps of the total psychological well-being of teachers through the analysis of personality factors, psychosocial climate, emotional intelligence, professional life stage, and burnout (total explained variance of psychological well-being).

Regression analysis	TPW	
	R^2	β
Psychosocial climate		
Job content	–	–
Personal relationships	0.014	0.116
Definition of role (disorganization)	–	–
Personality		
Emotional stability	0.381	0.383
Extraversion	–	–
Responsibility	0.005	0.080
Kindness	–	–
Openness to experience	0.018	0.134
Emotional intelligence		
Emotional attention	–	–
Emotional clarity	0.060	0.236
Emotional repair	0.026	0.193
Burnout		
Illusion for work	–	–
Psychological tiredness	–	–
Indolence, cynicism	0.081	−0.374
Guilt	–	–
Professional life stage	–	–
Total explained variance	**58.5%**	

$p < 0.01$; TPW, total psychological well-being. Bold aims to highlight the variance explained.

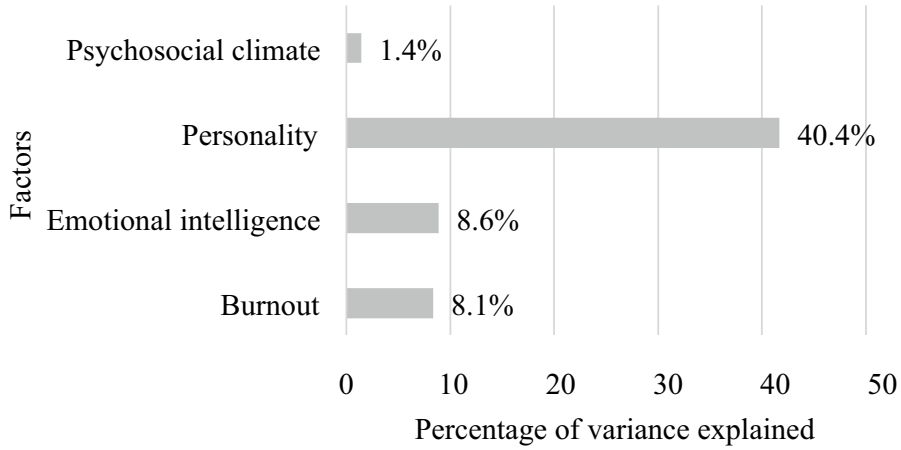

FIGURE 1
Explanatory model of psychological well-being in teachers with the variables of personality, emotional intelligence, burnout, and psychosocial climate. Total explained variance of psychological well-being 58.5%.

Finally, the model introduces the scale of psychosocial climate and personal relationships, which explains a small percentage but not less than 1.4% of the variance since relationships with others constitute the basis for the emergence of physical and mental health problems (Lima and Lerrechea, 2013; Millán et al., 2017).

It is concluded that psychological well-being is influenced by personality (particularly by emotional stability) although emotional intelligence and burnout also have an effect. The personality factor emotional stability, then, is the main predictor of psychological well-being in teachers and the measures of burnout, psychosocial climate, and emotional intelligence increase the predictive capacity of the

model, which explains 56.6% of the overall variance of the study (Lucas-Mangas, 2020). Therefore, the joint use of Psychosocial Climate and Models that include personality measures can predict and prevent burnout and improve psychological well-being in teaching environments more effectively than models that focus exclusively on environmental or individual variables.

After analyzing the results, this study presents an important practical implication in the initial evaluation of teacher candidates since if they are emotionally stable it will have an impact on their emotional well-being when they are in active service. It is suggested to use the tests that are used to identify burnout and well-being levels in teachers to develop preventive detection actions.

Finally, the main limitation of this research is that a larger sample would be more representative and would make it possible to provide a model that is more representative of the Spanish population; it is an ambitious project on which work continues. It would be interesting to conduct a longitudinal study to identify the changes that could occur among the factors involved and their impact on burnout and psychological well-being.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics Committee of University of Rovira i Virgili. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SL-M, JT-P, and IE-D: conceptualization. IE-D, AV, and JT-P: methodology. JT-P and IE-D: formal analysis and supervision. SL-M, LV-L, JT-P, and IE-D: investigation, resources, and writing – original draft preparation. IE-D and AV: data curation. SL-M, LV-L, JT-P, AV, and IE-D: writing – review and editing. LV-L: visualization. All authors contributed to the article and approved the submitted version.

Conflict of interest

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

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References

Adina, A., and Clipa, O. (2012). Teachers'satisfacction with life, job satisfaction and their emotional intelligence. *Proc. Soc. Behav. Sci.* 33, 498–502. doi: 10.1016/j.sbspro.2012.01.171

Aghababaei, N., and Arji, A. (2014). Well-being and the HEXACO model of personality. *Personal. Individ. Differ.* 56, 139–142. doi: 10.1016/j.paid.2013.08.037

Aguirre, J. I. P., Marsollier, R., and Vecino, J. (2020). Burnout docente: una revisión cartográfica conceptual [teaching burnout: a conceptual cartographic review]. *AWARI* 1, 125–138. doi: 10.13140/RG.2.2.17092.45440

Aparisi, D., Torregrosa, M. S., Ingles, C. J., and García, J. M. (2019). Stress, burnout and health in a sample of Spanish teachers. *Adv. High. Educ.* 3, 1–11. doi: 10.18686/ahe.v3i1.1128

Chico, E. (2000). Intensidad emocional y su relación con extraversión y neuroticismo [emotional intensity and its relation to extraversion and neuroticism]. *Psicothema* 12, 568–573.

De la Fuente, J., Amate, J., González-Torres, M. C., Artuch, R., García-Torrecillas, J. M., and Fadda, S. (2020). Effects of levels of self-regulation and regulatory teaching on strategies for coping with academic stress in undergraduate students. *Front. Psychol.* 11, 1–16. doi: 10.3389/fpsyg.2020.00022

Delhom, I., Satorres, E., and Meléndez, J. C. (2019). ¿Están los rasgos de personalidad asociados al bienestar psicológico? [are the personality traits associated with psychological well-being?]. *Escritos Psicol.* 12, 1–8. doi: 10.5231/psy.writ.2019.0107

Díaz, D., Rodríguez-Carvajal, R., Blanco, A., Moreno-Jiménez, B., Gallardo, I., Valle, C., et al. (2006). Adaptación española de las escalas de bienestar psicológico de Ryff [Spanish adaptation of Ryff's psychological well-being scales]. *Psicothema* 18, 572–577.

Díaz-Pincheira, F. J., and Carrasco-Garcés, M. E. (2018). Efectos del clima organizacional y los riesgos psicosociales sobre la felicidad en el trabajo [Effects of organizational climate and psychosocial risks on happiness at work]. *Contaduría Adm.* 63, 1–14. doi: 10.22201/fca.24488410e.2018.1142

Diener, E., and Lucas, R. E. (1999). "Personality and subjective well-being" in *Well-Being: The Foundations of Hedonic Psychology*. eds. D. Kahneman, E. Diener and N. Schwarz (New York: Russell Sage), 213–229.

Durán, A., Extremera, N., Rey, L., Fernández-Berrocal, P., and Montalbán, M. (2006). Predicting academic burnout and engagement in educational settings: assessing the incremental validity of perceived emotional intelligence beyond perceived stress and general self-efficacy. *Psicothema* 18, 158–164. doi: 10.1037/t01392-000

Espinoza-Díaz, I. M., Tous-Pallarès, J., and Vigil-Colet, A. (2015). Efecto del clima psicosocial del grupo y de la personalidad en el síndrome de quemado en el trabajo de los docentes [Effect of group psychosocial climate and personality on teachers' job burnout syndrome]. *An. Psicol* 31, 651–657. doi: 10.6018/analesps.31.2.174371

Faragher, E. B., Cass, M., and Cooper, C. L. (2005). The relationship between job satisfaction and health: a meta-analysis. *Occup. Environ. Med.* 62, 105–112. doi: 10.1136/oem.2002.006734

Fernández-Berrocal, P., Extremera, N., and Ramos, N. (2004). Validity and reliability of the Spanish modified version of the trait meta-mood scale. *Psychol. Rep.* 94, 751–755. doi: 10.2466/pr0.94.3.751-755

Fiorilli, C., Benevene, P., and De Stasio, S. (2019). Teachers' burnout: the role of trait emotional intelligence and social support. *Front. Psychol.* 10, 1–9. doi: 10.3389/fpsyg.2019.02743

Gale, C., Booth, T., Mõttus, R., Kuh, D., and Deary, I. (2013). Neuroticism and extraversion in youth predict mental wellbeing and life satisfaction 40 years later. *J. Res. Pers.* 47, 687–697. doi: 10.1016/j.jrp.2013.06.005

Gil-Monte, P. R. (2011). *Cuestionario Para la Evaluación del Síndrome de Quemarse por el Trabajo [Spanish Burnout Inventory (SBI)]*. Madrid, Spain: Tea Ediciones.

Gil-Monte, P. R., Unda, S., and Sandoval, J. I. (2009). Validez factorial del "Cuestionario Para la Evaluación del Síndrome de Quemarse por el Trabajo" (CESQT) en una muestra de maestros mexicanos [factorial validity of the "Spanish burnout inventory" (SBI) in a sample of Mexican techears]. *Salud Ment.* 32, 205–214.

Larsen, R. J. (2000). Toward a science of mood regulation. *Psychol. Inq.* 11, 129–141. doi: 10.1207/S15327965PLI1103_01

Lima, C. L., and Lerrechea, E. M. (2013). La práctica docente y su relación con el malestar docente [teaching practice and its relationship to teacher discomfort]. *Debates Educ.* 4, 40–57. doi: 10.28998/2175-6600.2012v4n8p40

Lorente, L. L., Salanova, M. S., Martínez, I. M., and Schaufeli, W. (2008). Extension of the job demands-resources model in the prediction of burnout and engagement among teachers over time. *Psicothema* 20, 354–360.

Lucas-Mangas, S. (2020). *Aprendizaje-Servicio en la Universidad. Desarrollo de Proyectos Emprendedores Socialmente Responsables con la Comunidad [Service-Learning at the University. Development of Socially Responsible Entrepreneurial Projects with the Community]*. Madrid, Dykinson.

Luhmann, M., Lucas, R. E., Eid, M., and Diener, E. (2013). The prospective effect of life satisfaction on life events. *Soc. Psychol. Personal. Sci.* 4, 39–45. doi: 10.1177/1948550612440105

Magnano, P., Santisi, G., Platania, S., Zammitti, A., and Tous-Pallarés, J. (2020). The Italian version of the work psychosocial climate scale [Escala clima psicosocial en el trabajo]. *Work* 66, 789–798. doi: 10.3233/WOR-203225

Martínez, L. M. (2020). Riesgos psicosociales y estrés laboral en tiempos de COVID-19: instrumentos Para su evaluación [psychosocial risks and work stress in times of COVID-19: instruments for its evaluation]. *Rev. Comun. Salud* 10, 301–321. doi: 10.35669/rcys.2020.10(2).301-321

Mayer, J. D., Salovey, P., and Caruso, D. R. (2000). "Models of emotional intelligence" in *Handbook of Intelligence*. ed. R. J. Sternberg (Cambrigde: Cambridge University Press), 396–420.

Merino-Tejedor, E., and Lucas-Mangas, S. (2016). La autoeficacia y la autorregulación Como variables moderadoras del estrés laboral en docentes de educación primaria [self-efficay and self-regulation as moderating variables of work stress in elementary school teachers]. *Univ. Psychol.* 15, 205–218. doi: 10.11144/Javeriana.upsy15-1.aavm

Millán, A., Calvanese, N., and D'Aubeterre, M. E. (2017). Condiciones de trabajo, estrés laboral, dependencia universitaria y bienestar psicológico en docentes universitarios [conditions of work, labor stress, university dependence and psychological well-being in university professor]. *Rev. Docencia Univ.* 15, 195–218. doi: 10.4995/redu.2017.6009

Moreno-Jiménez, B., Garrosa, E., Corso, S., Boada, M., and Rodríguez-Carvajal, R. (2012). Personalidad resistente y capital psicológico: las variables personales positivas y los procesos de agotamiento y vigor [hardy personality and psychological capital: the positive personal variables and the processes of exhaustion and vigor]. *Psicothema* 24, 79–86.

Moreno-Jiménez, B., Nelson, I., Natera, M., Rodríguez-Muñoz, A., and Morante, M. E. (2006). La personalidad resistente como variable moduladora del síndrome de burnout en una muestra de bomberos [Resilient personality as a modulating variable of burnout syndrome in a sample of firefighters]. *Psicothema* 18, 413–418.

Muñoz-Campos, E. M., Fernández-González, A., and Jacott, L. (2018). Bienestar subjetivo y satisfacción vital del profesorado [teachers' subjective well-being and satisfaction with life]. *Rev. Iberoam. Sobre Calidad Eficacia Cambio Educ.* 16, 105–117. doi: 10.15366/reice2018.16.1.007

Orozco, C. S., Vargas, J. D. P., Carvajal, O. I. G., and Torres, B. E. M. (2020). Bienestar psicológico, estrés y factores psicosociales en trabajadores de instituciones gubernamentales de Jalisco-México [psychological well-being, stress and psychosocial factors in workers of governmental institutions of Jalisco-Mexico]. *Rev. Ciencias Soc.* 26, 25–30.

Queirós, C., Carlotto, M. S., Kaiseler, M., Dias, S., and Pereira, A. M. (2013). Predictors of burnout among nurses: an interactionist approach. *Psicothema* 25, 330–335. doi: 10.7334/psicothema2012.246

Rakesh, H. (2011). An Investigation of the big Five and Narrow Personality Traits in Relation to Life Satisfaction [Master's Thesis, University of Tennessee]. Available at: http://trace.tennessee.edu/utk_gradthes/904

Rodríguez-Carvajal, R., Moreno-Jiménez, B., De Rivas, S., Bejarano, A., and Sanz-Vergel, A. I. (2010). Positive psychology at work: mutual gains for individuals and organizations. *Rev. Psicol. Trabajo Organ.* 26, 235–253. doi: 10.5093/tr2010v26n3a7

Sánchez-Teruel, D., and Robles-Bello, M. A. (2018). Instrumentos de evaluación en inteligencia emocional: una revisión sistemática cuantitativa [Assessment instruments in emotional intelligence: a quantitative systematic review]. *Perspect. Educ.* 57, 27–50. doi: 10.4151/07189729-vol.57-iss.2-art.712

Sánchez-Vidal, A. (2017). Empoderamiento, liberación y desarrollo humano [Empowerment, liberation and human development]. *Psychosoc. Interv.* 26, 155–163. doi: 10.1016/j.psi.2017.05.001

Soler, J. L., Aparicio, L., Díaz, O., Escolano, E., and Rodríguez, A. (2016). *Inteligencia Emocional y Bienestar II. Reflexiones, experiencias Profesionales e Investigaciones [Emotional Intelligence and Well-Being II. Reflections, Professional Experiences and Research]*. Zaragoza, Spain: Universidad San Jorge.

Tous-Pallarès, J., Bonasa-Jiménez, M. P., Mayor-Sánchez, C., and Espinoza-Díaz, I. M. (2011). Escala de Clima Psicosocial en el Trabajo: desarrollo y validación [Work Psychosocial Scale: Development and Validation]. *Anu. Psicol.* 41, 51–65. doi: 10.1344/anuario.any.volum.numero

Unda, S., Uribe, F., Jurado, S., García, M., Tovalín, H., and Juárez, A. (2016). Elaboración de una escala Para valorar los factores de riesgo psicosocial en el trabajo de profesores universitarios [construction of a scale for assessing at work psychosocial risk factors in professors]. *Rev. Psicol. Trab. Organ.* 32, 67–74. doi: 10.1016/j.rpto.2016.04.004

Valdivieso-León, L., Lucas-Mangas, S., Tous-Pallarés, J., and Espinoza-Díaz, I. M. (2020). Estrategias de afrontamiento del estrés académico universitario: educación infantil-primaria [coping strategies for academic stress in undergraduate students: early childhood and primary education]. *Educación XX1* 23, 165–186. doi: 10.5944/educXX1.25651

Vigil-Colet, A., Morales-Vives, F., Camps, E., Tous-Pallarès, J., and Lorenzo-Seva, U. (2013). Development and validation of the overall personality assessment scale (OPERAS). *Psicothema* 25, 100–106. doi: 10.7334/psicothema2011.411

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The impact of teaching-research conflict on turnover intention: cross-level interaction effect of justice climate

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Introduction: Research-based on the Job Demands-Resources theory (JD-R theory) has revealed a close relationship between teaching-research conflict and job burnout. However, there needs to be more investigation into the complex relationship between teaching-research conflict and turnover intentions from the perspective of this theory. To address these gaps, this study, grounded in the JD-R theory, explores the relationships among teaching-research conflict, career adaptability, justice climate, job burnout, and turnover intention.

Methods: Data collected through an online survey involving 858 Chinese university teachers, and the analysis utilized a Multilevel Structural Equation Model (MSEM) with Maximum Likelihood (ML) estimation.

Results: The findings reveal that job burnout mediates the relationship between teaching-research conflict and turnover intention. Career adaptability plays a moderating role in the connection between job burnout and turnover intention. Furthermore, justice climate exhibits a cross-level interaction effect concerning the relationship between teaching-research conflict and turnover intention.

Discussion: These findings offer innovative strategies for mitigating and preventing faculty turnover intention.

KEYWORDS

turnover intention, teaching-research conflict, justice climate, job burnout, career adaptability

1 Introduction

As part of their performance management reforms, China's higher education institutions have introduced a performance evaluation system based on the "publish or perish" principle. Several university leaders strictly depend on the number of academic papers as the sole criterion for evaluating faculty performance, resulting in a prevailing utilitarian trend in China's academic environment. Educators face the persistent challenge of generating the maximum number of research papers in the shortest period. Moreover, the substantial demands of teaching and the burden of routine administrative tasks deplete the cognitive and temporal resources of many educators, aggravating the experience of the teaching–research conflict (Cao et al., 2020; Lei et al., 2020; Naz and Arshad, 2022), leading to the increasing intention to leave their positions (Kaniuka, 2020; Simms et al., 2020; Asfahani, 2022; Li and Yao, 2022).

In line with this situation, the National Teacher Development Survey conducted by Peking University's School of Education specified that approximately 66% of higher education

professionals strongly intend to leave their current roles (Du and Liu, 2019). In addition, UNESCO highlights that teacher turnover has reached unprecedented levels, and the global enthusiasm for pursuing a career in education has decreased significantly (UNESCO, 2022). This compelling evidence suggests that the above phenomenon is not unique to China but is spreading globally. More importantly, research shows that university faculty turnover diminishes academic research output and organizational appeal (Lei et al., 2020), and includes financial costs and considerable time investment (Sorensen and Ladd, 2020). This situation could undermine the effective implementation of strategies aimed at national progress in science and education (Xu, 2017). For this reason, addressing the challenge of teacher turnover has become increasingly apparent not just for higher education institutions but also for government bodies and society at large. Therefore, an in-depth study of teacher turnover in higher education is necessary.

Owing to the irreversibility of turnover behavior, scholars believe that examining turnover intention as the early psychological process of actual turnover behavior holds immense practical significance (Tett and Meyer, 1993; Bratman, 2009; Bothma et al., 2013). Turnover intention is a psychological state corresponding to an employee's desire to leave their current position and commitment to this decision (Bratman, 2009). It has significant predictive power for assessing turnover rates (Tett and Meyer, 1993; Bratman, 2009; Bothma et al., 2013) and exhibits a strong association with multiple factors. These factors include job performance, mental health, career adaptability, burnout, organizational climate, and student academic achievement (Kaniuka, 2020; Saddam et al., 2022). Furthermore, extensive research on work–family conflict underscores the significance of role conflict as an antecedent to turnover intentions (Musadieq, 2020; Dodanwala et al., 2022). Simultaneously, scholars within the JD-R theory assert that role conflict constitutes a significant job demand (Wijayati et al., 2019; Boudrias et al., 2020). For instance, Li et al. (2019) established a robust association between teaching-research conflict, which represents a distinctive job demand, and burnout among university educators.

Nevertheless, the relationship between teaching–research conflict as a job demand and turnover intention remains underexplored. Building on the abovementioned points and considering China's current context, this study aims to examine the complex relationship between teaching–research conflict as a specific job demand and the turnover intention of university educators, employing the JD-R theory framework. The objective is to address research gaps and recommend potential strategies for mitigating turnover intention among Chinese higher education professionals.

1.1 Hypothesis development

1.1.1 Theoretical basis

The JD-R theory (Bakker and Demerouti, 2007; Bakker and Demerouti, 2014; Demerouti and Bakker, 2022) develops two interrelated yet distinct systems to shed light on employee behavior. Job demands include all work-related factors that deplete an individual's physical and mental energy and are significantly correlated with adverse job performance, burnout, and diminished job satisfaction. Such as elevated work pressure, role conflict, hostile working conditions, and irregular work hours (Bakker and Bal, 2010; Xu, 2017). Hence, it is evident that teaching–research conflict, a specific form of role conflict, can classified as one of these job demands (House and Rizzo, 1972; Xu, 2017; Cao et al., 2020; Lei et al., 2020; Li et al., 2021).

Job resources encompass diverse physical, psychological, social, and organizational aspects, categorized into external and internal resources. External resources include organizational and social components like organizational climate and social support (Bakker and Demerouti, 2007; Boudrias et al., 2020). From this, justice climate, as an organizational-level phenomenon (Liao and Rupp, 2005; Rupp et al., 2007; Chaiken and Ledgerwood, 2012), represents an external resource. Internal resources, or personal resources, consist of cognitive attributes and behavioral patterns, such as self-efficacy, organizational-based self-esteem, and optimism (Xanthopoulou et al., 2007). Hobfoll (2002) acknowledged these resources as fundamental components of individual adaptability, empowering individuals to exert control over their work environment. Accordingly, career adaptability represents a personal resource that can ignite intrinsic motivation, assist in coping with physical and psychological job demands, and enhance work engagement and overall well-being. Studies confirm that job resources significantly predict extra-role performance, job engagement, and disengagement (Demerouti et al., 2001).

Indisputably, JD-R theory provides invaluable insights, clarifications, and predictive capabilities concerning workplace burnout and performance. However, it is imperative to acknowledge the current research gap, especially when considering the relationship between multiple job resources, job demands and job outcomes. Therefore, this study decisively selects career adaptability as an individual resource and justice climate as an environmental resource. It aims to enhance our comprehension of how these resources coexist and impact employee outcomes, further contributing to the enrichment of research findings within JD-R theory.

1.1.2 Literature review

1.1.2.1 Teaching–research conflicts and turnover intention

Teaching–research conflict, a form of role conflict arising from discrepancies in role objectives or work content misalignment between teaching and research activities (Lewin, 1935; Elton, 1986; Mooney, 2022), has been the subject of empirical investigation within the JD-R theory framework. These studies highlight that teaching–research conflict, classified as job demands (House and Rizzo, 1972; Xu, 2017; Li et al., 2019; Cao et al., 2020; Lei et al., 2020), significantly contributes to job burnout among university educators (House and Rizzo, 1972; Xu, 2017; Cao et al., 2020; Lei et al., 2020). Moreover, teaching–research conflict significantly correlated with well-being, psychological capital, job insecurity, teacher self-efficacy, and teaching motivation (House and Rizzo, 1972; Xu, 2017; Li et al., 2019; Cao et al., 2020; Lei et al., 2020; Rafsanjani et al., 2020). However, current studies considering the relationship between teaching–research conflict and turnover intention remain theoretical (Martin and Berry, 1969; Fukudome, 2014), needing extensive empirical validation. Accordingly, this study places teaching–research conflict at the forefront of its research agenda to enrich the empirical research landscape and furnish more authoritative evidence.

According to the JD-R theory, job demands often include tasks requiring considerable cognitive effort or emotionally challenging interactions with individuals (Bakker et al., 2014). These tasks expend more physical and mental energy, potentially leading to damaging

consequences such as amplified stress and turnover intention (Demerouti and Bakker, 2022; Li et al., 2022). To rephrase it, teaching–research conflict, as job demands, can lead to adverse work-related outcomes, including an increased turnover intention (Daly and Dee, 2006). Notably, the context of China's National Strategy for Promoting Science and Education emphasizes the principle that "science and technology are the primary productive forces," leading to university faculty being increasingly coerced to prioritize scientific research. However, this sudden increase in research expectations disturbs the delicate balance between their teaching and research responsibilities, intensifying competition for time and energy (Cao et al., 2020; Estigoy et al., 2021). This intensification leads to high-intensity teaching–research conflict, triggering negative emotions such as anxiety and worry. These not only adversely affect the professional quality and self-evaluation of educators but also increase the likelihood of developing a strong turnover intention to resign (Kaniuka, 2020; Simms et al., 2020; Asfahani, 2022; Vercio et al., 2022; Lambert et al., 2023).

Considering the detrimental impact of teaching–research conflict on university educators and the existing research gaps, this study aims to examine the relationship between teaching–research conflict and turnover intention from the perspective of the JD-R theory. It also seeks to improve our understanding of the impact of teaching–research conflict and provide novel direction to alleviate educators' role conflict and turnover intention. Therefore, we propose the following hypothesis:

> *H1*: Teaching–research conflict is positively correlated with the turnover intention of university educators.

1.1.2.2 Mediating role of job burnout

Job burnout is a syndrome closely linked to the work environment, characterized is typified by sustained psychological distress and comprises three core dimensions: chronic exhaustion, indicative of the depletion of an individual's physical and emotional energy reserves; cynicism, denoting a detached and cynical attitude toward work; and diminished professional efficacy, signifying a decline in perceived competence and accomplishments within the organizational climate (Maslach et al., 2001). Li et al. (2022) and Schwab and Iwanicki (1982) revealed a substantial correlation between job burnout and role conflict. Furthermore, recent research underscores the role of job burnout as a mediating factor in the association between role conflict and turnover intention. For instance, Han et al. (2015) elucidated that role conflict effectively predicts job burnout among healthcare professionals, increasing the likelihood of their intention to leave their current employment. Similarly, Asfahani (2022) stresses the role of the exhaustion dimension of job burnout as a mediator between role conflict and turnover intention. Thus, it becomes apparent that individuals facing heightened role conflict are more likely to experience job burnout and, subsequently, their propensity toward turnover intention increases.

The JD-R theory boosts our understanding of the intricate connection between job demands (such as role conflict) and burnout. This theory states that elevated job demands are intrinsically related to health impairment, highlighting the potential risks of job burnout and subsequent health complications (Mäkikangas et al., 2020; Demerouti and Bakker, 2022; Bakker et al., 2023). Based on this theory, we can infer that in China's science and education revitalization policy, the tension between teaching and research has become a significant stressor for educators, implying heightened job demands. Educators must balance their teaching responsibilities and research tasks to foster university growth and enrollment. However, teaching and research demand substantial mental and cognitive resources, predisposing individuals to energy depletion, deteriorating physical health, and amplified susceptibility to job burnout. This leads to some educators intending to leave to escape these experiences (Chênevert et al., 2021).

Remarkably, within the JD-R theory, prior research has frequently treated occupational burnout as a dependent variable; however, the process effects of burnout warrant further investigation. Therefore, the study considers job burnout as a mediating variable in the relationship between teaching–research conflict and turnover intention, which aim to expand upon existing research, further offering empirical support for applying the JD-R theory to clarify the connections among teaching–research conflict, turnover intention, and burnout. Accordingly, we propose the following hypothesis:

> *H2*: Job burnout mediates the relationship between teaching–research conflict and turnover intention.

1.1.2.3 Moderating effect of career adaptability

Career adaptability, as emphasized by scholars such as Le et al. (2019), Savickas (1997), Savickas and Savickas (2019), and Stead et al. (2021) serves as a vital psychological asset that enables individuals to navigate the complex landscape of their careers efficiently. This unique capacity empowers individuals to proactively participate in shaping their career development, establishing, and managing their professional goals, and effectively adapting to the ever-changing dynamics that often influence the course of their careers (Savickas and Savickas, 2019; Haenggli and Hirschi, 2020; Stead et al., 2021). Substantial empirical evidence consistently underlines the indispensable role of career adaptability in faculty retention and turnover (Zhu et al., 2019). Furthermore, it is significantly associated with a broad spectrum of positive career outcomes, including career success, heightened work engagement (Yang et al., 2019), refined job-related competencies (Chan, 2015), elevated self-esteem (Hamzah et al., 2021), enhanced well-being, and successful management of job-related stress (Bakker et al., 2014). Haenggli and Hirschi (2020) also observed that career adaptability, which functions as a personal resource, effectively moderates educators' personal and occupational outcomes.

According to the JD-R theory, career adaptability is a personal resource, signifying constructive self-assessment and motivational drivers (Xanthopoulou et al., 2007; Bakker et al., 2014; Li et al., 2019). Like job resources, it is a buffer against job demands (Tremblay and Messervey, 2011; Bakker and de Vries, 2020). This theory highlights that a lack of resources complicates meeting job demands, leading to further withdrawal behavior. The long-term consequence is disengagement from work (Xanthopoulou et al., 2007; Bakker et al., 2014; Le et al., 2019). Conversely, individuals with abundant personal resources are less likely to experience job stress and burnout (Bakker et al., 2014). Additionally, Radey et al. (2023) noted that various job demands can readily lead to adverse outcomes without these personal resources. Therefore, it can be inferred that educators with a high level of career adaptability are likely to assist themselves in maintaining their professional efficacy, deriving meaning from the impact of burnout, further reducing withdrawal behavior, and thus suppressing turnover intention (Zhu et al., 2019). Conversely, educators with limited career adaptability may face challenges in efficiently managing

burnout caused by job demands, potentially increasing their likelihood of intending to leave their jobs.

While existing research has examined career adaptability within the context of job demands and burnout, a research gap exists regarding the role of career adaptability in the relationship between burnout and adverse work outcomes. Thus, the present study assigns career adaptability as a pivotal variable, serving as a buffer to mitigate the influence of job burnout on turnover intention. Based on this, we propose the following hypotheses:

> *H3*: Career adaptability moderates the relationship between job burnout and turnover intention.

1.1.2.4 Cross-level interaction impact of justice climate

Justice climate as a unit-level phenomenon (Liao and Rupp, 2005; Rupp et al., 2007; Chaiken and Ledgerwood, 2012). Research advocates that a justice climate is a substantial job resource (Boudrias et al., 2020). More precisely, it embodies the collective perception of justice at the group level, indicative of employees' shared perspectives on justice within the organization (Rupp et al., 2007; Li and Cropanzano, 2009; Priesemuth et al., 2013; Siswanti et al., 2020). This collective perception developed by aggregating the diverse justice-related viewpoints that employees hold (Whitman et al., 2012). Scholars rooted in social information and heuristic justice theories (Cropanzano et al., 2001; Lind et al., 2001; Chaiken and Ledgerwood, 2012) have determined the process by which a justice climate was generated. They proposed that the fundamental concept of a justice climate is comparable to the environment that individuals within an organization share. This environment comprises resources, procedures, decisions, common cognition, experiences, and organizational judgments. In simpler terms, members actively seek information about justice through social interactions and interpersonal communication in a group marked by interdependence and social interaction (Devine and Heath, 1999; Cohen, 2004; Zohar and Luria, 2004). Subsequently, they employ cognitive processes to synthesize and integrate this information, considering their own and others' perspectives. This cognitive synthesis reinforces justice judgments and culminates in constructing a collectively shared understanding of justice (Baldwin, 1992; Meyer, 1994; Johanson, 2000; Cropanzano et al., 2001). Moreover, within the heuristic justice theory framework (Lind et al., 2001), this collectively synthesized information is used as a cognitive shortcut to evaluate fair treatment, resulting in the emergence of the justice climate as a collective phenomenon (Rupp et al., 2007; Chaiken and Ledgerwood, 2012; Whitman et al., 2012).

In recent years, there has been a widespread call for research on equality, justice, and diversity, bringing the concept of justice climate and its associated research methods to the forefront. Empirical research has systematically operationalized the notion of a justice climate as a group-level phenomenon, often involving using direct or referent shifting approaches, where employee scores are aggregated into the composite justice climate of a group (Mossholder et al., 1998; Simons and Roberson, 2003; Liao and Rupp, 2005; Priesemuth et al., 2013; Walumbwa et al., 2017; Ambrose et al., 2019), which providing this study with a robust methodological foundation to assess justice climate as a group-level variable. Moreover, justice climate research has extended its influence across various fields, including social economics, management, and public health (Whitman et al., 2012; Priesemuth et al., 2013; Rupp et al., 2017; Siswanti et al., 2020). Notably, the justice climate negative correlation with turnover intention and the experience of role conflicts (Mengstie, 2020) and acts as a moderator in the relationship between individual perceptions of justice and job burnout (Martínez-Tur et al., 2020). However, previous research has frequently disregarded justice climate's influence on the interplay between teaching and research conflicts and its impact on turnover intention. Considering the paramount significance ascribed to educational equity by China's Ministry of Education as fundamental to social justice, researchers are compelled to engage in comprehensive investigations of the "justice climate" within the higher education sector, further providing a solid foundation for effecting enhancements in the "justice climate" of the educational system.

According to the JD-R theory, justice climate is an external resource of job resources, enabling the achievement of work-related objectives, mitigating job demands, and diminishing the physiological and psychological tolls they impose. Based on this, justice climate, categorized as a job resource, can potentially alleviate the effects of teaching–research conflict on turnover intention. More specifically, employees are likely to cope with stress and be more willing to work when the organization fosters a justice climate. In contrast, for educators working in an environment characterized by poor justice, the lack of equal treatment further erodes their confidence in their roles within educational institutions. This disenchantment with the current working environment increases the intention to leave (Lambert et al., 2023). Thus, we propose the following hypothesis:

> *H4*: The justice climate acts as a cross-level interaction in the impact mechanism of teaching–research conflict on turnover intention.

1.2 Current study

This study explores the relationships between two resources (career adaptability and justice climate), one job demand (teaching-research conflict), job burnout, and turnover intention, grounded in the JD-R theory. The conceptual model, as depicted in Figure 1.

2 Methods

2.1 Data collection and participants

This study utilized a cross-sectional design and employed convenience sampling for participant recruitment. Data was collected through an online survey administered via the Questionnaire Star network platform. Participants were initially provided comprehensive information about the study's content and objectives, ensuring transparency. They were subsequently informed of their right to withdraw from the study at any point and for any reason. Moreover, participants completed an online consent form confirming their voluntary participation in the anonymous questionnaire. Each participant will receive a reward of 20 yuan. Ethical approval for this study was diligently sought and obtained from the author's department.

The study involved 858 educators selected from 30 universities across diverse regions, including Heilongjiang Province, Inner

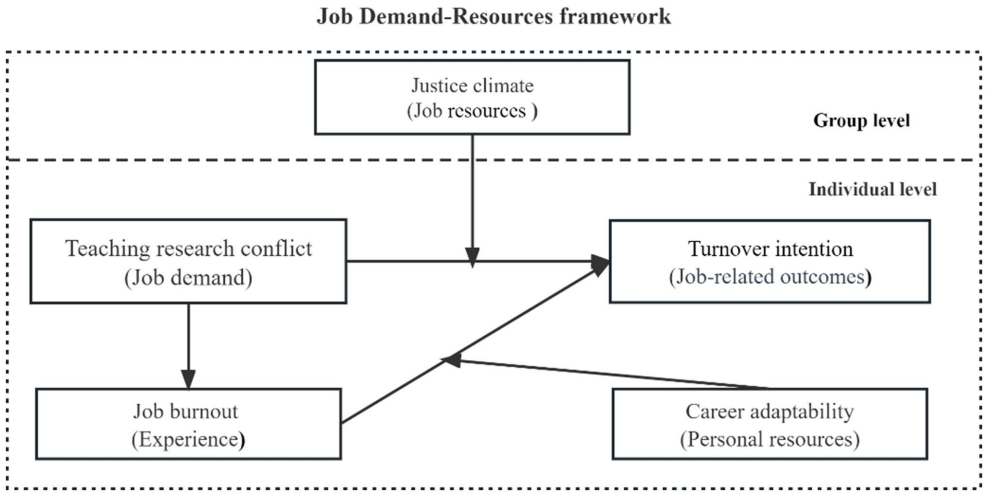

FIGURE 1
Conceptual model.

Mongolia Autonomous Region, Henan Province, Guangdong Province, Shanghai, Jilin Province, Jiangsu Province, and Beijing. The number of valid responses varied, ranging from 17 to 41 per university. The participant cohort consisted of 399 male and 459 female respondents representing various academic positions, including 177 professors, 280 associate professors, and 401 lecturers. In terms of the age distribution within the overall sample ($M = 40.66$; SD = 1.43), 221 individuals were below the age of 35, 378 fell within the 36–45 age category, 197 were situated within the 46–55 age range, and 62 were aged between 56 and 65 years.

2.2 Instruments

2.2.1 Teaching–research conflict

Teaching–research conflict was measured based on Xu's (2017) revised Chinese Teaching–Research Conflict Scale, derived from the Teacher/Coach Role Conflict Scale (Mellor et al., 2020); the 10 items were rated on a 7-point Likert scale. The higher the score, the higher the teaching and research role conflict. Cronbach's α was 0.74 in this study. The fit indices of the confirmatory factor analysis were as follows: $\chi^2/df = 2.41$, RMSEA = 0.03, CFI = 0.95, IFI = 0.95, TLI = 0.96.

2.2.2 Turnover intention

Turnover intention was measured based on Ran et al.'s (2020) revised Turnover Intention Scale, which included six items. Using a 5-point Likert scale. The higher the score, the stronger the willingness to leave. Cronbach's α was 0.72 in this study. The fit indices of the confirmatory factor analysis were as follows: $\chi^2/df = 3.07$, RMSEA = 0.05, CFI = 0.93, IFI = 0.92, TLI = 0.91.

2.2.3 Job burnout

Job burnout was measured based on Xu et al.'s (2004) revised Job Burnout Scale, which includes 15 items. Each statement was rated on a 5-point Likert scale. Cronbach's α was 0.88 in this study. The fit indices of the confirmatory factor analysis were as follows: $\chi^2/df = 4.58$, RMSEA = 0.06, CFI = 0.95, IFI = 0.93, TLI = 0.92.

2.2.4 Career adaptability

Career adaptability was measured based on Yu et al.'s (2019) revised Career Adapt-Abilities Scale–Short Form (CAAS-SF), which included four dimensions and 12 items, and each statement was rated using a 5-point Likert scale. Cronbach's α was 0.87 in this study. The fit indices of the confirmatory factor analysis were as follows: $\chi^2/df = 3.62$, RMSEA = 0.05, TFI = 0.98, IFI = 0.99, CFI = 0.99.

2.2.5 Justice climate

Following established research on justice and teams, we employed a referent-shift consensus model to evaluate the overall justice climate (Naumann and Bennett, 2000; Cropanzano et al., 2001; Chen et al., 2007; Thornton and Rupp, 2015). In line with Priesemuth et al. (2013), justice climate was measured based on three referent-shift items from the 6-item overall Justice Scale developed by Ambrose et al. (2019) to measure the overall justice climate. Employees were asked to indicate their agreement level with statements concerning the justice of the organization's treatment of its employees. Ratings were collected on a 5-point scale. The justice climate at the group level was subsequently aggregated based on employees' perceptions of organizational justice. Cronbach's α for the scale was 0.93 in this study. The fit indices of the confirmatory factor analysis were as follows: $\chi^2/df = 2.82$, RMSEA = 0.04, CFI = 0.94, IFI = 0.95, and TLI = 0.94.

2.3 Data analysis

SPSS software was utilized for various essential tasks, including reliability analysis, generation of descriptive statistics, execution of correlation analyses, and evaluation of common method bias analysis on the pivotal variables. Subsequently, more advanced analytical procedures were employed utilizing Mplus software, including constructing a MSEM using the ML estimator and applying the Johnson–Newman technique to perform simple slope analysis tests. Additionally, the study examined moderation and mediation effects using the error-corrected bootstrap resampling method through 5,000 iterations. This meticulous methodology facilitated the precise

computation of point estimates and derivation of 95% confidence intervals to assess indirect effects. Adopting this robust and comprehensive approach, this study aimed to provide an accurate understanding of the relationships between the variables under scrutiny.

3 Results

3.1 Common method bias test

This study performed a bifactor model comparison to test for common method bias. The results showed that the five-factor model of this study had $\chi^2/df = 5.04$ and RMSEA = 0.04; the path coefficients for each factor were significant, indicating a good model fit. However, after adding the common factor G, the model fit index failed to meet measurement standards. This indicates that the model without the common factor was better than that with the added one, verifying that the study had no serious common method bias.

3.2 Descriptive statistics and correlation analysis

This study examined the correlation between group-level justice climate and other individual variables. The results showed that turnover intention correlated significantly with teaching–research conflict, job burnout, and career adaptability ($r = -0.19 \sim 0.63$, $p < 0.01$). Job burnout correlated significantly with teaching–research conflict ($r = 0.48$, $p < 0.01$). The justice climate group was significantly correlated with teaching–research conflict, job burnout, and career adaptability ($r = -0.16 \sim -0.07$, $p < 0.05$). Career adaptability was significantly correlated with teaching–research conflict and job burnout ($r = -0.13 \sim -0.10$, $p < 0.05$). Table 1 presents the details.

3.3 Cross-level interaction effect model test

Following Grimm's (2017) framework, the initial step concerned assessing the feasibility of aggregating data from the individual to the group level. By the ML estimation technique within an MSEM using Mplus 8.0. The effectiveness of data aggregation was assessed using criteria such as rWG, ICC (1), and ICC (2). The results revealed that the median value of rWG for team cross-border behavior was 0.98, surpassing the threshold of 0.5, suggesting a substantial level of agreement in the aggregation process. ICC (1) was calculated at 0.015, indicating significant variance among different groups. Additionally, ICC (2) demonstrated a value of 0.84, exceeding the threshold of 0.70. These results indicated that aggregating justice climate into the group-level variable was viable. Subsequently, the study constructed multilevel path analysis models to test the research hypotheses systematically.

The results showed that justice climate had a significant cross-level predictive effect on the turnover intention of university educators ($\beta = -0.04$, $p < 0.01$). The cross-level interaction effect of justice climate on the path between teaching–research conflict and turnover intention was significant ($\beta = -0.06$, $p < 0.01$). The predictive effect of teaching–research conflict on job burnout was significant ($\beta = 0.48$, $p < 0.01$). Job burnout significantly predicted turnover intention ($\beta = 0.39$, $p < 0.01$). Career adaptability significantly predicted educators' turnover intention ($\beta = -0.06$, $p < 0.01$). The interaction term involving career adaptability and job burnout significantly predicted educators' turnover intention ($\beta = -0.04$, $p < 0.01$). The moderated mediation effect of teaching–research conflict on turnover intention was −0.02. The results demonstrated that job burnout mediates the influence of teaching–research conflict on turnover intention, and career adaptability has a moderate effect on the mediation of job burnout. Additionally, justice climate has a cross-level interaction effect on the path between teaching–research conflict and turnover intention. Details of Multilevel structure equation model is in Figure 2.

3.3.1 Simple slopes of career adaptability

Following the recommendations of Bauer and Curran (2005), this study employed the Johnson-Newman technique to test the simple slope of career adaptability (Johnson and Fay, 1950). This technique offers a comprehensive analysis by considering the entire spectrum of career adaptability values, thus overcoming the limitation of previous studies that concentrated solely on extreme values. The result found that job burnout significantly predicted turnover intention at the entire value range of career adaptability. However, when career adaptability was low, job burnout had a more substantial effect on turnover intention (M − 1 SD; $\beta = 0.43$, $p < 0.01$) than on high career adaptability (M + 1 SD; $\beta = 0.33$, $p < 0.01$). The results indicated that the predictive effect of job burnout on turnover intention is low when the career adaptability score is high. Details of the simple slope results for career adaptability are in Figure 3.

3.3.2 Simple slopes of justice climate

The Johnson-Newman technique was employed to test the simple slope of justice climate. The results showed that the conditional effect

TABLE 1 Descriptive statistics and correlation analysis ($n = 858$).

	$x \pm s$	1	2	3	4	5
1. Teaching-research conflict	4.04 ± 1.21	1				
2. Job burnout	3.45 ± 0.96	0.48**	1			
3. Career adaptability	3.01 ± 0.98	−0.10**	−0.13**	1		
4. Turnover intention	3.10 ± 0.87	0.33**	0.63**	−0.19**	1	
5. Justice climate group mean	3.47 ± 1.47	−0.16**	−0.07*	0.14**	−0.13**	1

**$p < 0.01$; *$p < 0.05$.

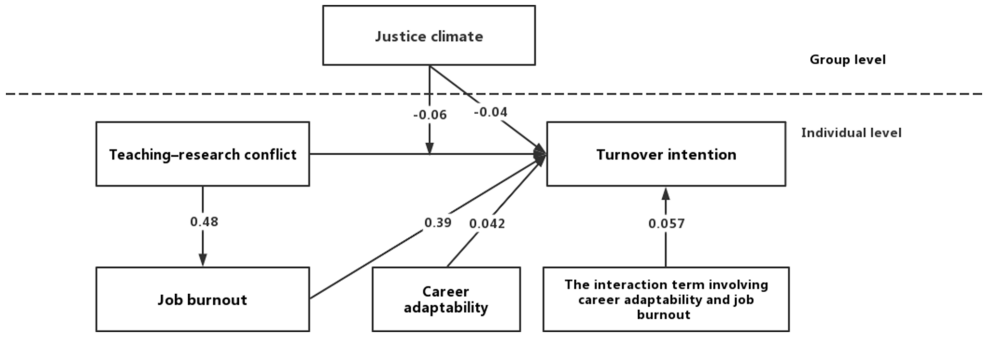

FIGURE 2
Multilevel structure equation model.

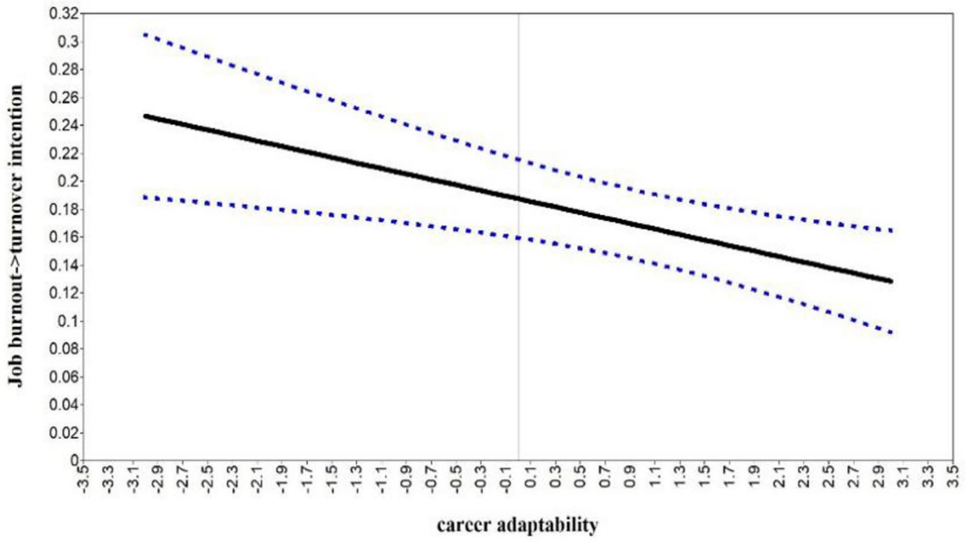

FIGURE 3
Johnson–Newman regions of significance and confidence bands for the conditional relation between job burnout on turnover intention as a function of career adaptability.

of teaching–research conflict on turnover intention ($\beta > 0.04$, $p < 0.05$) was significantly positive at justice climate levels less than M-0.08 SD. When the justice climate level was above M + 1.1 SD, the teaching–research conflict had a negative path coefficient on turnover intention ($\beta < -0.03$, $p < 0.05$). However, when the score of justice climate was between M-0.08 SD to M + 1.1 SD, the direct effect of teaching–research conflict on turnover intention was no longer significant ($-0.03 < \beta < 0.04$, $p > 0.05$). Thus, the difference in the justice climate may change the direct effect of teaching–research conflicts on turnover intention. When the justice climate was less than M-0.08 SD, with the improvement of the justice climate, the positively direct effect of teaching–research conflicts on turnover intention was gradually decreased. When the justice climate was higher than M + 1.1 SD, the direct effect of teaching–research conflict on turnover intention change was negative. Furthermore, when the justice climate was M-0.08 SD to M + 1.1 SD, the direct effect of teaching–research conflict on turnover intention disappeared. Details of the simple slope results for justice climate are in Figure 4.

4 Discussion

4.1 Main effect

This study's results highlighted that teaching–research conflict has a significant positive direct effect on turnover intention, confirming H1. This finding aligns with prior research, particularly that of Asfahani (2022), who conducted a study of 58 Saudi universities and higher education institutions. The results showed that the teaching–research conflict is positively correlated with turnover intention. These findings provide empirical support for the foundational assumption of JD-R theory, which posits that high job demands lead to adverse work-related outcomes (Mellor et al., 2020). Ongoing reform initiatives within China's higher education sector have aggravated the inherent tensions between teaching and research roles (Xu, 2017). As underscored by Lei et al. (2020) and Wang et al. (2020), the combination of responsibilities spanning from fulfilling teaching duties to engaging in research often results in compounded workloads

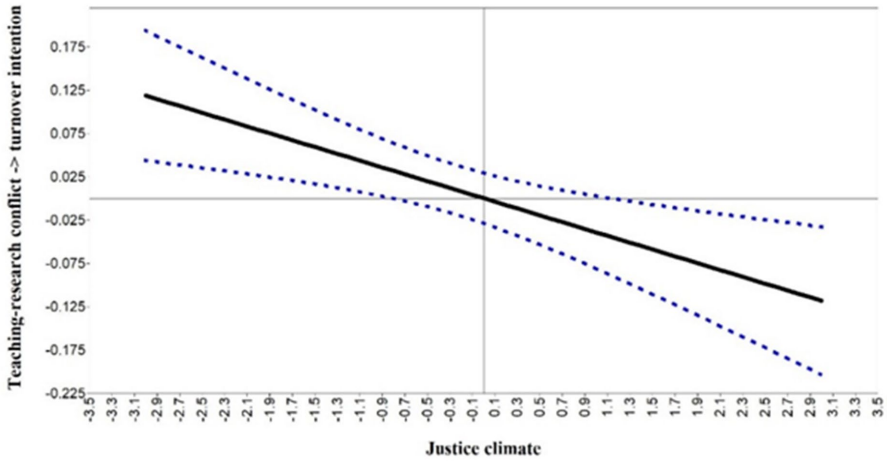

FIGURE 4
Johnson–Newman regions of significance and confidence bands for the conditional relation between teaching–research conflict on turnover intention as a function of justice climate.

and resource constraints, heightening role conflicts, impeding effective task execution, fostering negative work experiences, and further intensifying educators' intentions to leave their positions.

It is crucial to recognize that the implications of teaching–research conflict on educators' turnover intention may extend beyond the specific Chinese higher education context. As Martin and Berry (1969) mentioned, teaching and research are inseparable facets of the roles of many university professors, transcending cultural and geographical boundaries. Educators worldwide are likely to face similar challenges, as they strive to balance their teaching and research responsibilities. Furthermore, a survey conducted by Geschwind and Broström (2014) on how three Swedish universities manage the research–teaching relationship disclosed a distinct contradiction between academic faculties' institutional incentives and teaching requirements, underlining this issue's universal nature. As educators' roles continue to evolve globally, understanding the factors that contribute to their job satisfaction and retention has become a collective concern. While our study is centered on China's unique context, the principles explained here may resonate with educators in diverse cultural settings and educational systems. Consequently, our study's results lay the foundation for future cross-cultural research, allowing for a more profound exploration of how cultural and institutional factors influence the interplay between teaching–research conflict and turnover intention.

4.2 Mediation effect

This study's results support H2, demonstrating the significant mediating role of job burnout in the relationship between teaching–research conflict and turnover intention， spotlighting the vital role of job burnout as a mediating variable within the JD-R model. This finding aligns with prior research, such as Bakker et al. (2004), which demonstrated that job demands predict role performance through their impact on job burnout. However, a unique background premise sets our research apart from that of Bakker et al. (2004). Specifically, this study's results highlight the applicability of job burnout as a mediating variable within the JD-R model in the context of Chinese higher education and establish a foundation for utilizing the JD-R theory within the Chinese academic environment.

According to this theory, job demands have consistently emerged as the primary catalyst for burnout, leading to adverse health outcomes and organizational consequences (Bakker et al., 2014). In other words, high job demands lead to a greater prevalence of maladaptive self-regulatory cognition and behavior. This progression over time may culminate in persistent burnout and harmful organizational consequences. Thus, the demanding nature of teaching and research tasks requires educators to invest significant physical and psychological effort in depleting their cognitive and time resources. This, in turn, has adverse health effects, amplifying the potential risks of job burnout and diminishing professional efficacy, as supported by Li et al. (2022) and Saddam et al (2022). Ultimately, the cumulative impact of high job demands and burnout contributes to educators' intention to leave their positions (Sokal et al., 2020). These results lay a solid foundation for applying the JD-R theory to comprehend the psychological aspects of turnover intention within the Chinese higher education system. Therefore, education administrators should prioritize addressing teaching–research conflict and mitigating job burnout among university educators to reduce turnover intention.

4.3 Moderation mediating effect

This study's results support H3, demonstrating that career adaptability moderates the relationship between job burnout and turnover intention. The results suggest that personal resources, such as career adaptability, act as a buffer to mitigate the impact of high-level job burnout on adverse job outcomes rather than merely moderating the experience of job burnout resulting from teaching–research conflict. This finding aligns with that of Rudolph et al. (2021), who found that occupational adaptability moderates the

negative impact of radical occupational changes on perceived adaptive effectiveness. These results align with the JD-R theory, which postulates that employees with ample resources are likely to have positive work experiences, greater self-evaluations, enhanced performance, improved job satisfaction, and reduced burnout (Bakker et al., 2014; Savickas, 2023). Consequently, they are less likely to consider turnover (Zhu et al., 2019). In simpler terms, when educators experience job burnout due to managing teaching–research conflict, those with high career adaptability proactively seek new opportunities, explore diverse research methods, and continuously augment their skills, injecting renewed vigor into their career trajectory (Xanthopoulou et al., 2007; Bakker et al., 2014; Le et al., 2019; Rasheed et al., 2020). However, educators with low career adaptability struggle to manage their burnout experience caused by job demands efficiently, leading to higher turnover intention.

Therefore, in China's rapidly evolving economic and social landscape, this study underscores career adaptability's pivotal role in mitigating the effects of teaching–research conflict and job burnout on turnover intention. As individuals with personal agency, university educators should strive to harness their resources to assuage burnout, further inhibit turnover intention, safeguard their physical and mental well-being, and boost their professional development within their work context.

4.4 Cross-level interaction effect

This study's results reveal a significant cross-level interaction effect of justice climate within the context of the relationship between teaching–research conflict and turnover intention, thus supporting H4, aligns with Tangirala and Ramanujam (2008), who verified the cross-level implications of procedural justice climate on employee silence, thereby confirming the pivotal role of justice climate as a job resource influencing individuals at the group level. Notably, the simple slope analysis results revealed a distinct pattern. When the justice climate falls below M-0.08 SD, teaching–research conflict significantly and positively drives turnover intention. Conversely, when the justice climate exceeds M + 1.1 SD, it negatively impacts turnover intention. Within the justice climate range of M-0.08 SD to M+ 1.1 SD, the influence of teaching–research conflict on turnover intention becomes statistically insignificant. It indicates that as the justice climate improves, there is a dynamic shift in the relationship between teaching–research conflict and turnover intention, moving from positive to negligible and ultimately to negative. It introduces a novel and noteworthy possibility that, as the justice climate improves, teaching–research conflict no longer leads to an intention to leave; instead, it deters educators' turnover intention. This may hint at the curious effect of the conflict between judicial climate and pedagogical research, implying that the role of pedagogical research conflict has changed. Based on the JD-R theory, we infer that a high-level justice climate helps educators transform teaching–research conflict into a driving force for self-development, incentivizing educators to remain in academic institutions and diminishing their intentions to leave.

The results validate a fundamental premise of the JD-R theory in the Chinese context, which underlines the critical role of a justice climate as a job resource in mitigating the adverse effects of job demands on individual stress levels, promoting professional development, and facilitating goal achievement. Furthermore, the shift in the direction of the influence of teaching–research conflict and turnover intention is significant because it indicates whether teaching–research conflict serves as a catalyst for educators to leave or whether an external motivator for self-improvement depends on the justice climate within their institutions. Specifically, a high justice environment assuages the adverse impact of job demands and offers a safety net for educators in coping with teaching–research conflict. Additionally, it can transform teaching–research conflict into a driving force for self-development, incentivizing educators to remain in academic institutions and weakening their turnover intention (Lambert et al., 2023). In contrast, university educators with a low level of fairness are likelier to leave their work environment faster due to the impact of teaching–research conflict. This finding implies that an unfair working climate can lead to unequal negative emotions among educators, resulting in dissatisfaction with their current work environment and a higher likelihood of resigning (Baillie, 2009).

Furthermore, the results indicate that when individual and environmental resources coexist, they assume distinct roles in shaping employee turnover intention through varying mechanisms. For instance, in this study, adaptability moderates the relationship between burnout and turnover intention. It is evident that when individual and environmental resources coexist, the former, including occupational adaptability, tends to address job demand-induced burnout, thereby enhancing employees' work. In contrast, environmental resources can directly counteract the adverse consequences of job demands. These results enrich our understanding of existing theories and indicate that personal and environmental resources may uniquely mitigate the negative impacts of job demands.

In summary, this study's comprehensive analysis of the cross-level moderating effect of the justice climate emphasizes the transformative influence of an improved justice climate on the relationship between teaching–research conflict and turnover intention. This outcome underscores the significance of the justice climate within Chinese educational institutions, as it can determine whether teaching–research conflict acts as a catalyst for educators to leave universities or as an external motivator for self-improvement. Additionally, it advances current research, boosting our understanding of the role of work-related resources, such as the justice climate, in mitigating the impact of job demands while furnishing valuable insights for future investigations into the complex relationship between these factors.

4.5 Implications

This study has several noteworthy implications. First, rooted in the JD-R theory, this study has meticulously revealed the intricate mechanisms underpinning the relationship between teaching–research conflict and turnover intention among Chinese university faculty. This validates the applicability of the JD-R theory within the Chinese academic context. Moreover, this study introduced the significant role of job burnout as a mediating factor in this relationship. It highlights the potential for organizations to reduce educators' turnover intention by addressing teaching–research conflict and implementing targeted interventions to mitigate job burnout. Additionally, our research underlines the moderating impact of career adaptability, offering practical guidance for organizations to develop measures that reduce educator burnout and turnover intention by enhancing career adaptability. The study emphasizes the significance of the justice climate within educational

institutions and determines whether teaching–research conflict catalyzes educators to leave universities or as an external motivator for self-improvement. It advances existing research, enhancing our understanding of the role of work-related resources, particularly the justice climate and job demands. These results further reinforce the evidence for the urgency of fostering equitable environments in higher education. Finally, the study's findings disclose that when individual and environmental resources coexist, they assume distinct roles in shaping employee turnover intention through varying mechanisms. This diversity in resource roles provides innovative ideas for formulating intervention methods to reduce turnover intention based on resource factors.

In terms of practical application, organizations can utilize these findings to help reduce turnover intention among employees, especially within the academic sector, where educator retention is crucial. It is essential to recognize the mediating function of job burnout and the need for relevant departments to provide professional psychological counseling services for educators. The focus should be on mitigating burnout and lowering turnover intention by providing such services. Furthermore, considering the pivotal role of career adaptability in the professional setting, educators and academic institutions should prioritize the enhancement of career adaptability. By effectively harnessing this resource, the adverse effects of burnout stemming from the conflict between teaching and research on educators can be mitigated. Finally, recognizing the vital importance of promoting fairness and equity within colleges and universities, concerted efforts should be made to promote equitable practices. It involves implementing measures and policies that ensure fairness, equal treatment, and impartial practices in educational institutions, ultimately contributing to faculty members' well-being, thus inhibiting turnover intention.

4.6 Limitations

This study has limitations warranting acknowledgment to provide a clear understanding of the research's scope and avenues for future investigation. First, the cross-sectional design employed in data collection limits the capacity to establish causal relationships. While associations between variables have been identified, further research should use longitudinal or experimental methods to examine the dynamic interplay among variables. Second, this study's findings are rooted in the context of Chinese universities, with distinct cultural norms, academic traditions, and institutional practices. This context-specific focus raises questions about the findings' generalizability to diverse cultural and regional contexts. Future research should encompass a broader array of cultural and regional contexts. Finally, despite this study's careful consideration of numerous variables, the influence of unmeasured variables remains a possibility. Other factors within and outside the workplace could influence the relationships under investigation. Future research should, therefore, explore these unmeasured variables to refine the model.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by the Human Subjects Review Committee at Guangzhou University. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

ZS: Writing – original draft, Writing – review & editing. WH: Methodology, Writing – review & editing.

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Conflict of interest

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

Publisher's note

References

Ambrose, M. L., Rice, D. B., and Mayer, D. M. (2019). Justice climate and workgroup outcomes: the role of coworker fair behavior and workgroup structure. *J. Bus. Ethics* 172, 79–99. doi: 10.1007/s10551-019-04348-9

Asfahani, A. M. (2022). The impact of role conflict on turnover intention among faculty members: a moderated mediation model of emotional exhaustion and workplace relational conflict. *Front. Psychol.* 13:1087947. doi: 10.3389/fpsyg.2022.1087947

Baillie, C. *Engineering and society: Working towards social justice part I: Engineering and society*. Cham: Springer International Publishing. (2009).

Bakker, A. B., and Bal, M. P. (2010). Weekly work engagement and performance: a study among starting teachers. *J. Occup. Organ. Psychol.* 83, 189–206. doi: 10.1348/096317909X402596

Bakker, A. B., and de Vries, J. D. (2020). Job demands–resources theory and self-regulation: new explanations and remedies for job burnout. *Anxiety Stress Coping* 34, 1–21. doi: 10.1080/10615806.2020.1797695

Bakker, A. B., and Demerouti, E. (2007). The job demands-resources model: state of the art. *J. Manag. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115

Bakker, A. B., and Demerouti, E. (2014). "Job demands-resources theory" in *Well-being* (Chichester, UK: John Wiley and Sons, Ltd), 1–28.

Bakker, A. B., Demerouti, E., and Sanz-Vergel, A. I. (2014). Burnout and work engagement: the JD–R approach. *Annu. Rev. Organ. Psych. Organ. Behav.* 1, 389–411. doi: 10.1146/annurev-orgpsych-031413-091235

Bakker, A. B., Demerouti, E., and Sanz-Vergel, A. (2023). Job demands–resources theory: ten years later. *Annu. Rev. Organ. Psych. Organ. Behav.* 10, 25–53. doi: 10.1146/annurev-orgpsych-120920-053933

Bakker, A. B., Demerouti, E., and Verbeke, W. (2004). Using the job demands-resources model to predict burnout and performance. *Hum. Resour. Manag.* 43, 83–104. doi: 10.1002/hrm.20004

Baldwin, M. W. (1992). Relational schemas and the processing of social information. *Psychol. Bull.* 112, 461–484. doi: 10.1037/0033-2909.112.3.461

Bauer, D. J., and Curran, P. J. (2005). Probing interactions in fixed and multilevel regression: inferential and graphical techniques. *Multivar. Behav. Res.* 40, 373–400. doi: 10.1207/s15327906mbr4003_5

Bothma, Chris, F. C., and Roodt, G. (2013). The validation of the turnover intention scale. *J. Human Resour. Mana.* 11:1. doi: 10.4102/sajhrm.v11i1.507

Boudrias, V., Trépanier, S.-G., Foucreault, A., Peterson, C., and Fernet, C. (2020). Investigating the role of psychological need satisfaction as a moderator in the relationship between job demands and turnover intention among nurses. *Employee Relat.* 42, 213–231. doi: 10.1108/ER-10-2018-0277

Bratman, M. E. (2009). "Intention, belief, practical, theoretical" in *Spheres of reason* (Oxford: Oxford University Press), 29–61.

Cao, C., Shang, L., and Meng, Q. (2020). Applying the job demands-resources model to exploring predictors of innovative teaching among university teachers. *Teach. Teach. Educ.* 89:103009. doi: 10.1016/j.tate.2019.103009

Chaiken, S., and Ledgerwood, A. (2012). "A theory of heuristic and systematic information processing" in *Handbook of theories of social psychology*, *vol. 1*. Eds. P. A. M. Van Lange, A. W. Kruglanski and E. T. Higgins (London: SAGE Publications Ltd), 246–266.

Chan, S. H. J., and Mai, X. (2015). The relation of career adaptability to satisfaction and turnover intentions. *J. Vocat. Behav.* 89, 130–139. doi: 10.1016/j.jvb.2015.05.005

Chen, Z., Lam, W., and Zhong, J. A. (2007). Leader-member exchange and member performance: a new look at individual-level negative feedback-seeking behavior and team-level empowerment climate. *J. Appl. Psychol.* 92, 202–212. doi: 10.1037/0021-9010.92.1.202

Chênevert, D., Kilroy, S., Johnson, K., and Fournier, P.-L. (2021). The determinants of burnout and professional turnover intentions among Canadian physicians: application of the job demands-resources model. *BMC Health Serv. Res.* 21:6981. doi: 10.1186/s12913-021-06981-5

Cohen, S. (2004). Social relationships and health. *Am. Psychol.* 59, 676–684. doi: 10.1037/0003-066X.59.8.676

Cropanzano, R., Byrne, Z. S., Ramona Bobocel, D., and Rupp, D. E. (2001). Moral virtues, fairness heuristics, social entities, and other denizens of organizational justice. *J. Vocat. Behav.* 58, 164–209. doi: 10.1006/jvbe.2001.1791

Daly, C. J., and Dee, J. R. (2006). Greener pastures: faculty turnover intent in urban public universities. *J. High. Educ.* 77, 776–803. doi: 10.1353/jhe.2006.0040

Demerouti, E., and Bakker, A. B. (2022). Job demands-resources theory in times of crises: new propositions. *Organ. Psychol. Rev.*:204138662211350. doi: 10.1177/20413866221135022

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Devine, F., and Heath, S.. *Sociological research methods in context*. London: Macmillan Education, UK. (1999).

Dodanwala, T. C., Santoso, D. S., and Yukongdi, V. (2022). Examining work role stressors, job satisfaction, job stress, and turnover intention of Sri Lanka's construction industry. *Int. J. Constr. Manag.* 23, 1–10. doi: 10.1080/15623599.2022.2080931

Du, Q., and Liu, X. J. (2019). The role of turnover tendency and academic power perception of college teachers: an empirical analysis based on the 2016 National College Teacher Development Survey. *J. China High. Educ. Res.* 9, 48–53. doi: 10.16298/j.cnki.1004-3667.2019.09.09

Elton, L. (1986). Research and teaching: Symbiosis or conflict. *High. Educ.* 15:299. doi: 10.1007/bf00129218

Estigoy, E. B., Bazer, S. C., Jimenez, J. A., Pineda, J. D., and Zabala, S. O. (2021). High-performance work practices: extent of implementation and commitment in higher education institution. *Int. J. Res. Innov. Soc. Sci.* 5, 545–553. doi: 10.47772/IJRISS.2021.5126

Fukudome, H. (2014). "Teaching and research in the academic profession: Nexus and conflict" in *The changing academic profession in Japan*. Ed. A. Arimoto (Cham: Springer International Publishing), 169–183.

Geschwind, L., and Broström, A. (2014). Managing the teaching–research Nexus: ideals and practice in research-oriented universities. *Higher Educ. Res. Dev.* 34, 60–73. doi: 10.1080/07294360.2014.934332

Greenhaus, J. H., and Beutell, N. J. (1985). Sources of conflict between work and family roles. *Acad. Manag. Rev.* 10, 76–88. doi: 10.2307/258214

Grimm, K. (2017). Review of multilevel modeling using Mplus, by W. Holmes finch and Jocelyn E. Bolin. *Struct. Equ. Model. Multidiscip. J.* 24, 960–962. doi: 10.1080/10705511.2017.1347045

Haenggli, M., and Hirschi, A. (2020). Career adaptability and career success in the context of a broader career resources framework. *J. Vocat. Behav.* 119:103414. doi: 10.1016/j.jvb.2020.103414

Hamzah, S. R., Le, K. K., and Musa, S. N. S. (2021). The mediating role of career decision self-efficacy on the relationship of career emotional intelligence and self-esteem with career adaptability among university students. *Int. J. Adolesc. Youth* 26, 83–93. doi: 10.1080/02673843.2021.1886952

Han, S. S., Han, J. W., and Choi, E. H. (2015). Effects of nurses' job stress and work-family conflict on turnover intention. *Asian Women* 31:1. doi: 10.14431/aw.2015.09.31.3.1

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Rev. Gen. Psychol.* 6, 307–324. doi: 10.1037/1089-2680.6.4.307

House, R. J., and Rizzo, J. R. (1972). Role conflict and ambiguity as critical variables in a model of organizational behavior. *Organ. Behav. Hum. Perform.* 7, 467–505. doi: 10.1016/0030-5073(72)90030-X

Johanson, J.-E. (2000). Intraorganizational influence. *Manag. Commun. Q.* 13, 393–425. doi: 10.1177/0893318900133002

Johnson, P. O., and Fay, L. C. (1950). The Johnson-Neyman technique, its theory and application. *Psychometrika* 15, 349–367. doi: 10.1007/BF02288864

Kaniuka, T. (2020). "Estimating the effects of administrator evaluation policy on teacher working conditions and turnover using piecewise regression" in *Proceedings of the 2020 AERA annual meeting* (Washington DC: AERA)

Lambert, E. G., Hogan, N. L., Worley, R. M., and Solinas-Saunders, M. (2023). The effects of justice views on turnover intent, sick-leave views, and sick-leave use among private prison staff. *J. Appl. Security Res.* 3, 374–96. doi: 10.1080/19361610.2022.2161798

Le, K. K., Hamzah, S. R., and Omar, Z. (2019). Conceptualising personal resources on career adaptability. *Int. J. Acad. Res. Bus. Soc. Sci.* 9:6378. doi: 10.6007/IJARBSS/v9-i9/6378

Lei, W., Li, J., Li, Y., Castaño, G., Yang, M., and Zou, B. (2020). The boundary conditions under which teaching–research conflict leads to university teachers' job burnout. *Stud. High. Educ.* 46, 406–422. doi: 10.1080/03075079.2020.1811218

Lewin, K. (1935). Psycho-sociological problems of a minority group. *J. Person.* 3, 175–187. doi: 10.1111/j.1467-6494. 1935. tb01996.x

Li, A., and Cropanzano, R. (2009). Fairness at the group level: justice climate and Intraunit justice climate. *J. Manag.* 35, 564–599. doi: 10.1177/0149206308330557

Li, Y., Li, Y., and Castaño, G. (2019). The impact of teaching-research conflict on job burnout among university teachers. *Int. J. Confl. Manag.* 31, 76–90. doi: 10.1108/IJCMA-05-2019-0080

Li, X., Lin, X., Zhang, F., and Tian, Y. (2021). Playing roles in work and family: effects of work/family conflicts on job and life satisfaction among junior high school teachers. *Front. Psychol.* 12:772025. doi: 10.3389/fpsyg.2021.772025

Li, S., Ten Berge, J., and Kristiansen, M. H. (2022). Burnout and its antecedents: considering both work and household time claims, and flexibility in relation to burnout. *Front. Public Health* 10:863348. doi: 10.3389/fpubh.2022.1064385

Li, R., and Yao, M. (2022). What promotes teachers' turnover intention? Evidence from a Meta-analysis. *Educ. Res. Rev.* 37:100477. doi: 10.1016/j.edurev.2022.100477

Liao, H., and Rupp, D. E. (2005). The impact of justice climate and justice orientation on work outcomes: a cross-level multifoci framework. *J. Appl. Psychol.* 90, 242–256. doi: 10.1037/0021-9010.90.2.242

Lind, E. A., Kray, L., and Thompson, L. (2001). Primacy effects in justice judgments: testing predictions from fairness heuristic theory. *Organ. Behav. Hum. Decis. Process.* 85, 189–210. doi: 10.1006/obhd.2000.2937

Mäkikangas, A., Leiter, M. P., Kinnunen, U., and Feldt, T. (2020). Profiling development of burnout over eight years: relation with job demands and resources. *Eur. J. Work Organ. Psy.* 30, 720–731. doi: 10.1080/1359432x.2020.1790651

Martin, T. W., and Berry, K. J. (1969). The teaching-research dilemma: its sources in the university setting. *J. High. Educ.* 40, 691–703. doi: 10.2307/1978139

Martínez-Tur, V., Moliner, C., and Maniezki, A. (2020). "Organizational justice" in *Essentials of job attitudes and other workplace psychological constructs*. Eds. V. I. Sessa and N. A. Bowling (New York, NY: Routledge), 45–70.

Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job burnout. *Annu. Rev. Psychol.* 52, 397–422. doi: 10.1146/annurev.psych.52.1.397

Mellor, C., Gaudreault, K., and Fadale, C. (2020). The veteran and the novice: investigating teacher–coach role conflict from two perspectives. *Phys. Educ.* 77, 313–331. doi: 10.18666/TPE-2020-V77-I2-9173

Mengstie, M. M. (2020). Perceived organizational justice and turnover intention among hospital healthcare workers. *BMC Psychol.* 8:387. doi: 10.1186/s40359-020-0387-8

Meyer, G. W. (1994). Social information processing and social networks: a test of social influence mechanisms. *Hum. Relat.* 47, 1013–1047. doi: 10.1177/001872679404700901

Mooney, C. J. (2022). ERIC-EJ427333- professors feel conflict between roles in teaching and research, say students are badly prepared., Chronicle of Higher Education, 1991. *Chron. High. Educ.* 37

Mossholder, K. W., Bennett, N., and Martin, C. L. (1998). A multilevel analysis of procedural justice context. *J. Organ. Behav.* 19, 131–141. doi: 10.1002/(SICI)1099-1379(199803)19:2<131::AID-JOB878>3.0.CO;2-P

Musadieq, M. A. (2020). Effect of work conflict, work involvement, and family work conflict on turnover intentions and intention to move through job satisfaction as a moderation. *Int. J. Appl. Manag. Theory Res.* 2, 41–53. doi: 10.4018/IJAMTR.2020070103

Naumann, S. E., and Bennett, N. (2000). A case for procedural justice climate: development and test of a multilevel model. *Acad. Manag. J.* 43, 881–889. doi: 10.2307/1556416

Naz, F., and Arshad, T. (2022). Job stress among academic Faculty in Higher Education Institutions: the role of research-teaching conflict and perceived publication pressure. *Pakistan J. Educ. Res. Eval.* 9, 1–20.

Priesemuth, M., Arnaud, A., and Schminke, M. (2013). Bad behavior in groups. *Group Organiz. Manag.* 38, 230–257. doi: 10.1177/1059601113479399

Radey, M., Wilke, D. J., Stanley, L. H., and Sabuncu, B. C. (2023). Independent and combined effects of workplace harassment among child welfare workers. *J. Aggress. Maltreat. Trauma*, 1–21.

Rafsanjani, M. A., Pamungkas, H. P., Prakoso, A. F., and Sholikhah, N. (2020). Does teacher-researcher role conflict influence psychological well-being among the lecturers? *Tadris* 5, 287–296. doi: 10.24042/tadris.v5i2.6091

Ran, L., Chen, X., Peng, S., Zheng, F., Tan, X., and Duan, R. (2020). Job burnout and turnover intention among Chinese primary healthcare staff: the mediating effect of satisfaction. *BMJ Open* 10:e036702. doi: 10.1136/bmjopen-2019-036702

Rasheed, Imran, M., Okumus, F., Weng, Q., Hameed, Z., Nawaz, M. S., et al. (2020). Career adaptability and employee turnover intentions: The role of perceived career opportunities and orientation to happiness in the hospitality industry. *J. Hospitality Tourism Manag.* 44, 98–107. doi: 10.1016/j.jhtm.2020.05.006

Rudolph, C. W., Allan, B., Clark, M., Hertel, G., Hirschi, A., Kunze, F., et al. (2021). Pandemics: implications for research and practice in industrial and organizational psychology. *Ind. Organ. Psychol.* 14, 1–35. doi: 10.1017/iop.2020.48

Rupp, D., Bashshur, M., and Liao, H. (2007). Justice climate past, present, and future: models of structure and emergence. *Res. Multilevel Issues* 6, 357–396. doi: 10.1016/s1475-9144(07)06017-1

Rupp, D. E., Shapiro, D. L., Folger, R., Skarlicki, D. P., and Shao, R. (2017). A critical analysis of the conceptualization and measurement of organizational justice: is it time for reassessment? *Acad. Manag. Ann.* 11, 919–959. doi: 10.5465/annals.2014.0051

Saddam, M. (2022). Application of Environmental Accounting for Company Performance. *Zenodo.* Available at: https://zenodo.org/record/7076474.

Savickas, M. L. (1997). Career adaptability: an integrative construct for life-span, life-space theory. *Career Dev. Q.* 45, 247–259. doi: 10.1002/j.2161-0045.1997.tb00469.x

Savickas, M. L. (2023). "Career construction assessment" in *Career Counseling. 2nd* Ed. M. Schreiber (Washington: American Psychological Association), 71–88.

Savickas, M. L., and Savickas, S. (2019). "A history of career counselling" in *International handbook of career guidance.* Ed. J. A. Athanasou (Cham: Springer International Publishing), 25–43.

Schwab, R. L., and Iwanicki, E. F. (1982). Perceived role conflict, role ambiguity, and teacher burnout. *Educ. Adm. Q.* 18, 60–74. doi: 10.1177/0013161X82018001005

Simms, A., Fear, N. T., and Greenberg, N. (2020). The impact of having inadequate safety equipment on mental health. *Occup. Med.* 70, 278–281. doi: 10.1093/occmed/kqaa101

Simons, T., and Roberson, Q. (2003). Why managers should care about fairness: the effects of aggregate justice perceptions on organizational outcomes. *J. Appl. Psychol.* 88, 432–443. doi: 10.1037/0021-9010.88.3.432

Siswanti, Y., Tjahjono, H. K., Hartono, A., and Prajogo, W. (2020). Leader–member exchange in mediating interpersonal justice and informational justice climate toward counterproductive work behavior. *J. Southwest Jiaotong Univ.* 55:2724. doi: 10.35741/issn.0258-2724.55.4.8

Sokal, L. J., Eblie Trudel, L. G., and Babb, J. C. (2020). Supporting teachers in times of change: the job demands-resources model and teacher burnout during the COVID-19 pandemic. *Int. J. Contemp. Educ.* 3:67. doi: 10.11114/ijce.v3i2.4931

Sorensen, L. C., and Ladd, H. F. (2020). The hidden costs of teacher turnover. *AERA Open* 6:233285842090581. doi: 10.1177/2332858420905812

Stead, G. B., LaVeck, L. M., and Hurtado, S. M. (2021). Career adaptability and career decision self-efficacy: Meta-analysis. *J. Career Dev.* 49, 951–964. doi: 10.1177/08948453211012477

Steiner, D. D. (2020). "Organizational justice" in *Oxford research Encyclopedia of psychology* (Oxford: Oxford University Press)

Tangirala, S., and Ramanujam, R. (2008). Employee silence on critical work issues: the cross level effects of procedural justice climate. *Pers. Psychol.* 61, 37–68. doi: 10.1111/j.1744-6570.2008.00105.x

Tett, R. P., and Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on Meta-analytic findings. *Pers. Psychol.* 46, 259–293. doi: 10.1111/j.1744-6570.1993.tb00874.x

Thornton, M. A., and Rupp, D. E. (2015). The joint effects of justice climate, group moral identity, and corporate social responsibility on the prosocial and deviant behaviors of groups. *J. Bus. Ethics* 137, 677–697. doi: 10.1007/s10551-015-2748-4

Tremblay, M. A., and Messervey, D. (2011). The job demands-resources model: further evidence for the buffering effect of personal resources. *SA J. Ind. Psychol.* 37:876. doi: 10.4102/sajip.v37i2.876

UNESCO. (2022). *World teachers' day: UNESCO sounds the alarm on the global teacher shortage crisis*. Paris: UNESCO.

Vercio, C., Peltier, C., Ryan, M., Khidir, A., Jackson, J., Dallaghan, G. B., et al. (2022). Can we ensure that workshops are effective in their goal? Impact of a National Education Workshop on participants' subsequent scholarship. *Med. Sci. Educator* 32, 287–290. doi: 10.1007/s40670-021-01500-x

Walumbwa, F. O., Hartnell, C. A., and Misati, E. (2017). Does ethical leadership enhance group learning behavior? Examining the mediating influence of group ethical conduct, justice climate, and peer justice. *J. Bus. Res.* 72, 14–23. doi: 10.1016/j.jbusres.2016.11.013

Wang, P., Chu, P., Wang, J., Runsheng Pan, Y., Sun, M. Y., Jiao, L., et al. (2020). Association between job stress and organizational commitment in three types of Chinese university teachers: mediating effects of job burnout and job satisfaction. *Front. Psychol.* 11:576768. doi: 10.3389/fpsyg.2020.576768

Whitman, D. S., Caleo, S., Carpenter, N. C., Horner, M. T., and Bernerth, J. B. (2012). Fairness at the collective level: a Meta-analytic examination of the consequences and boundary conditions of organizational justice climate. *J. Appl. Psychol.* 97, 776–791. doi: 10.1037/a0028021

Wijayati, D. T., Kautsar, A., and Karwanto, K. (2019). Emotional intelligence, work family conflict, and job satisfaction on junior high school Teacher's performance. *Int. J. Higher Educ.* 9:179. doi: 10.5430/ijhe.v9n1p179

Xanthopoulou, D., Bakker, A. B., Demerouti, E., and Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *Int. J. Stress. Manag.* 14, 121–141. doi: 10.1037/1072-5245.14.2.121

Xu, F., Ji, F., and Chao, Q. (2004). The development of job burnout questionnaire in primary and secondary teachers. *Chin. J. Clinical Psychol.* 1, 13–14.

Xu, L. (2017). Teacher–researcher role conflict and burnout among Chinese university teachers: a job demand-resources model perspective. *Stud. High. Educ.* 44, 903–919. doi: 10.1080/03075079.2017.1399261

Yang, X., Feng, Y., Meng, Y., and Qiu, Y. (2019). Career adaptability, work engagement, and employee well-being among Chinese employees: the role of guanxi. *Front. Psychol.* 10:1029. doi: 10.3389/fpsyg.2019.01029

Yu, H., Dai, Y., Guan, X., and Wang, W. (2019). Career adapt-abilities scale–short form (CAAS-SF): validation across three different samples in the Chinese context. *J. Career Assess.* 28, 219–240. doi: 10.1177/1069072719850575

Zhu, F., Cai, Z., Buchtel, E. E., and Guan, Y. (2019). Career construction in social exchange: a dual-path model linking career adaptability to turnover intention. *J. Vocat. Behav.* 112, 282–293. doi: 10.1016/j.jvb.2019.04.003

Zohar, D., and Luria, G. (2004). Climate as a social-cognitive construction of supervisory safety practices: scripts as proxy of behavior patterns. *J. Appl. Psychol.* 89, 322–333. doi: 10.1037/0021-9010.89.2.322

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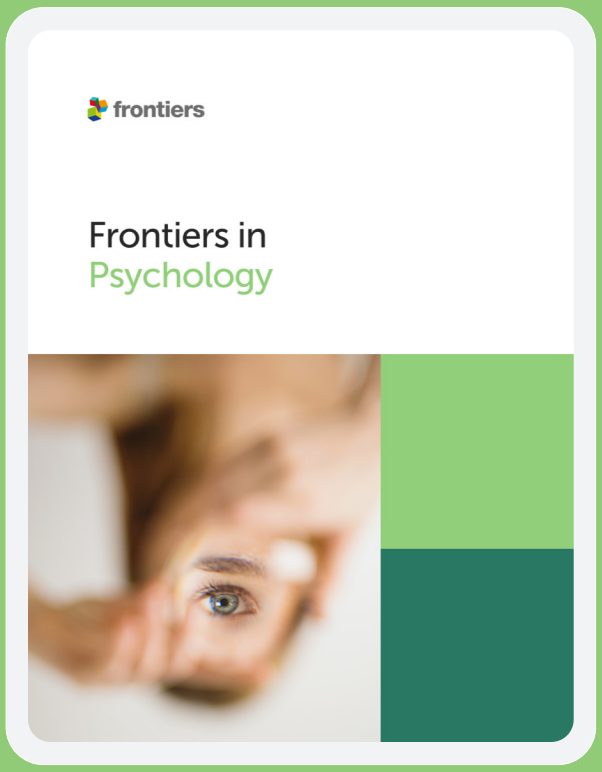

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