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Physical and mental wellbeing, teaching efficacy and school connectedness—A study with preschool teachers in Portugal

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This article aims to investigate correlations between physical and mental wellbeing, teaching efficacy and school connectedness and to explore the relationship between those dimensions and sociodemographic variables such as age, teaching experience, academic qualifications, education sector, and geographical regions. For this purpose, an online questionnaire was applied to 450 preschool teachers. To assess physical and mental wellbeing the PISA 2020 teacher questionnaire was used, and to evaluate teaching efficacy and school connectedness the Subjective Teacher Wellbeing Questionnaire was applied. Descriptive statistics were calculated for all variables. The reliability, internal consistency and suitability of the data for factor analysis. were assessed for each of the questionnaires. The ANOVA test and Kruskal–Wallis's test were used to identify significant differences between the dimensions under analysis and sociodemographic variables. The results show that school connectedness is positively related to teaching efficacy and the same positive association occurs between physical and mental wellbeing. A negative association is observed between school connectedness and physical and mental wellbeing and teaching efficacy and physical wellbeing and mental wellbeing. The results also indicate that older preschool teachers and those with more years of experience had a significantly higher score in teaching efficacy than their younger and less experienced counterparts. The preschool teachers from the Porto and North Regions of Portugal had significantly higher scores in the mental wellbeing dimension when compared with their colleagues from other regions of the country.

KEYWORDS

preschool teachers, physical wellbeing, mental wellbeing, teaching efficacy, school connectedness

Introduction

The concept of wellbeing is complex (Pollard and Lee, 2003) and has been subject to much discussion, giving rise to vague definitions (Forgeard et al., 2011). To find a definition suitable to our research aims we drew upon Dodge et al. (2012) definition focused on three key areas: (1) the idea of a set point for wellbeing; (2) the certainty of equilibrium/homeostasis; and (3) the fluctuating state between challenges and resources. In this way, wellbeing is defined as a balance between an individual's resource pool and the challenges faced. Stable and solid wellbeing is reached when individuals have the psychological, social and physical resources they need to meet a psychological, social and/or physical challenge. When individuals have more challenges than resources, or vice-versa, the equilibrium disappears, along with the state of wellbeing. This definition supports the multidimensional nature of wellbeing.

Physical and mental wellbeing

Early childhood education is complex requiring practitioners' knowledge of child development theories and the observation of teaching values, as well as socio-professional skills in their relationships with colleagues and children's families. Herman et al. (2018) refer that educators are confronted with a range of challenges and stressors in their work, including responding to the varied needs of children and navigating interpersonal relationships and expectations of students, parents, and colleagues. Spilt et al. (2011) argued that issues such as time pressure and balancing the requirements of the profession with their personal lives constitute an obstacle to recruiting and retaining high-quality staff. These challenging factors may cause stress and anxiety in preschool teachers particularly when their own beliefs and values do not match the workplace values. Moreover, educators have complex roles with numerous responsibilities and tasks (Rose and Rogers, 2012). Even with strong feelings of self-fulfillment and high levels of dedication, teaching young children is a challenging career. Studies have raised concerns about the struggle of many preschool teachers with poor physical and mental wellbeing (Whitaker et al., 2013; Linnan et al., 2017; Otten et al., 2019).

Gray et al. (2017) stated that preschool teachers' wellbeing is a critical factor in healthy environments beneficial for the development of children. Collie and Perry (2019) argued that a sense of wellbeing is connected to teachers' ongoing professional growth. An educator's emotional state impacts how they think about their teaching and influences their attitudes daily (Sutton and Wheatley, 2003). A recent study demonstrated that poor wellbeing decreases educators' confidence in teaching children with social and communicative problems (Sisask et al., 2014).

Kwon et al. (2020), in a study with 262 preschool teachers, found that those educators believed that working with children was their calling and expressed high commitment to their work. Preschool teachers must feel well to have a good performance. Cumming (2017) described early childhood educator wellbeing as involving individual factors, as well as contextual, relational, systemic, and discursive factors. Kwon et al. (2019) launched a project called "The Happy Teacher Project" to investigate teacher wellbeing, incorporating perspectives and research from multiple disciplines. The results of the Happy Teacher Project indicated that many preschool teachers revealed serious issues with both their mental and physical wellbeing (Kwon et al., 2020).

Health is recognized as "a state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity" (World Health Organization, 2012, p. 12). As a result, educators who keep working while suffering social and mental health problems not only impact the quality of the support they provide to children (Gerber et al., 2007) but also increase the possibility of enduring health problems (Skagen and Collins, 2016).

Teaching efficacy

Self-efficacy is a valuable predictor of people's behavior and wellbeing (Reyhing and Perren, 2021). The theory of self-efficacy was grounded on Bandura (1997) social-cognitive theory, which defines self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Different individual traits shape teacher self-efficacy. Wolters and Daugherty (2007) established connections between teacher self-efficacy and work experience (Tschannen-Moran and Johnson, 2011; von Suchodoletz et al., 2018). Teachers' job satisfaction may be another personal predictor of self-efficacy. Job satisfaction is generally considered the result of teacher self-efficacy, but the direction of the effect is not obvious (Klassen and Durksen, 2014).

Contextual and personal factors may be relevant in explaining interindividual differences and changes in self-efficacy (Perren et al., 2017). Several case studies showed the importance of a positive environment to self-efficacy development (Klassen and Durksen, 2014; Bautista and Boone, 2015). Cumming and Wong (2018) argued that it is challenging for educators to develop an accurate professional identity that reflects the complexities of their profession. Vintimilla (2018) states that educators have shown some doubts about their practice, children, curriculum, and education in general and these uncertainties impact their daily routines and practices. Positive experiences and qualified support have been pointed out as predictors of self-efficacy improvement during pre-service training (Atay, 2007). Pas et al. (2012) also found some studies showing a change in teacher self-efficacy in the first years of the teaching career. Positive relationships have been found between teachers' self-efficacy ratings and their job-related aspirations, work engagement and teaching efficacy (Skaalvik and Skaalvik, 2007).

A high level of self-efficacy allows teachers to perform better in their teaching tasks (Avey et al., 2011; Ferreira, 2022). Furthermore, when teachers feel competent, they improve their teaching quality, strengthen children's learning, and place more meaning into their lives, reaching emotional satisfaction and wellbeing.

School connectedness

School connectedness is related to a range of positive educational and developmental outcomes, including psychosocial health and wellbeing (Allen et al., 2021). Woodhead and Brooker (2008) described school connectedness and belonging as "the relational dimension of personal identity, the fundamental psycho-social "glue" that locates every individual. . .at a particular position

in space, time, and human society and most importantly, connects people to each other" (Woodhead and Brooker, 2008, p. 3). Belongingness in the working environment is understood to be (i) the sense of connectedness and (ii) the individual experiences within the learning environment (Levett-Jones et al., 2009). Connectedness is more related to the individual's subjective feelings through reciprocal engagement whereas belongingness is more related to feeling part of a group where one is accepted, integrated, and recognized from a professional point of view (Gray et al., 2015).

Relationships between teachers matter (Reis-Jorge et al., 2024). Winn and Winn (2021) valued healthy teachers' relationships as a dimension for restorative justice, leading to an increased solidarity and collective action within schools that can lead to transformative teaching praxis. School connectedness among teachers has been associated with various positive educational and health outcomes (Lester et al., 2013). The means and instruments by which the school environment influences teachers' health are not entirely understood but teacher connectedness seems to act both as a health resource (García-Moya et al., 2015) and a protective factor (McNeely and Falci, 2004).

Belonging and wellbeing are closely related (Haim-Litevsky et al., 2023). Educators who experience a sense of belonging are more likely to have a greater sense of connectedness to what they do and to feel empowered to contribute (Owusu-Ansah and Kyei-Blankson, 2016). When educators feel they can communicate openly and participate in respectful conversations and professional enquiry, the school's culture takes advantage (Noddings, 2010).

The first years of life are crucial for school success and adult life (Ferreira et al., 2021). In Portugal, preschool is attended by children between 3 and 6 years of age. Preschool teachers set the tone for the classroom through the values they express, the pedagogical practices they use, and the overall relationship approach they implement. There are references in the literature to the impact that factors such as physical wellbeing, mental wellbeing, teaching efficacy and school connectedness can have on preschool teachers' professionality. In the present study, the aims are (1) to assess potential correlations between physical wellbeing, mental wellbeing, teaching efficacy and school connectedness and (2) to explore the relationship between those dimensions and sociodemographic variables.

Materials and methods

Participants

The sample consists of 450 preschool teachers from different regions of Portugal, with a predominance in the Lisbon area. Most of the participants are women, which is representative of the gender distribution of preschool teaching staff in the country. The vast majority are over 40 years of age, hold a Bachelor's or a Master's degree, and have more than 15 years of teaching experience mainly in the Public and Social Solidarity School sectors (**Table 1**).

Data collection instruments

To evaluate the physical and mental wellbeing, teaching effectiveness and school connection of preschool teachers and respective statistical correlations, two Likert-type questionnaires were used:

(a) To assess physical and mental wellbeing, the Physical and Mental Wellbeing Assessment Questionnaire based on the PISA 2020 teacher questionnaire (QBEFM) (Viac and Fraser, 2020) was used. This instrument examines how often teachers experience psychosomatic symptoms during a working day. Responses to the different items are on a five-point interval Likert scale: 1–Never or almost never; 2–Once or twice a year; 3–Once or twice a month; 4–Once or twice a week; 5–Every day or almost every day.

(b) To assess the effectiveness of teaching and connection to the school, the Subjective Teacher Wellbeing Questionnaire (QSBED) (Renshaw, 2020) was used. Responses to the different items are on a four-point interval Likert scale: 1–Almost never; 2–Sometimes; 3–Often; 4–Almost always.

Procedures and data analysis

The ethical requirements inherent to an investigation of this nature were guaranteed. They were included on the first page of the

TABLE 1 Sample distribution by sociodemographic variables (n = 450).

	Frequency	Percentage (%)
Gender		
Male	5	1.10
Female	445	98.9
Age		
20–40	122	27.1
41–50	146	32.4
More than 50	182	40.4
Years of service		
Less than 15	117	26.0
15–25	154	34.2
More than 25	178	39.6
Academic qualification		
Bachelor	292	64.9
Master	125	27.8
Other	33	7.3
Education sector		
Public	174	38.7
IPSS	190	42.2
Private	85	18.9
District		
Porto and North	90	20.0
Center region	63	14.0
Lisboa area	235	52.2
Alentejo and Algarve	42	9.3
Madeira and Açores	18	4.0

instrument, explaining the purpose and procedures, and ensuring confidentiality and anonymity of the data. Information was also provided about the availability of the Psychological/Counseling Support Office of our Institution to provide support for any kind of distress as a result of taking part in the study. All participants explicitly agreed to participate in the study voluntarily and gave their informed consent before answering the questionnaire. The questionnaire was sent randomly to several schools via Google Forms. It was sent to the School Principals who forwarded it to the teachers. The questionnaire was available from April to June 2023 and the response rate was 62%. Of the 455 returned questionnaires 450 were completed and validated for the study.

Descriptive statistics were calculated for all variables. In terms of the reliability of the instruments, the internal consistency was assessed using Cronbach's alpha for each of the questionnaires and the suitability of the data from the QBEFM and QSBED for Factor Analysis was verified, using the value of the Kaiser–Meyer–Olkin measure and Bartlett's sphericity test. The ANOVA test was applied to verify the existence of significant differences for Mentwb by district and the Kruskal–Wallis's test to identify significant differences in all other dimensions and sociodemographic variables.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS, v.28). Statistical significance was set at $p < 0.05$.

Results

Descriptive statistics were calculated for all items. Regarding QBEFM, the results of two items stand out from the others. On a 5-point interval scale item 3. Back pain—has an average response rate of 3.67 and item 7. Fatigue–has an average response rate of 3.64. The remaining eight items are distributed, in descending order, as follows: 5. Irritability—2.95; 4. Feeling down—2.93; 6. Feeling nervous—2.84; 9. Feeling anxious—2.78; 10. Sleep deprivation—2.73; 1. Headache—2.72; 8. Feeling dizzy—1.99; 2. Stomach pain—1.94.

Afterward, an exploratory factor analysis was carried out. Regarding QBEFM, we verified the suitability of the data for Factor Analysis by running Bartlett's Test of Sphericity and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy. The calculated output values indicated that the data is suitable for Factor Analysis–Kaiser–Meyer–Olkin measurement value (KMO = 0.916) and Bartlett's test of sphericity (p-value = 0.00) (Revelle, 2016).

To assess QBEFM internal consistency and reliability we used Cronbach's alpha measure (Tavakol and Dennick, 2011). The resulting coefficient of reliability was 0.9 for the total of the scale, 0.91 for factor 1 (Mentwb), and 0.73 for factor 2 (Physwb).

The QBEFM factor analysis identified two factors (**Table 2**). Factor 1—Mental wellbeing (Mentwb) (items—4, 5, 6, 7, 9 and 10); Factor 2—Physical wellbeing (Physwb) (items—1, 2, 3 and 8). In opposition to the original study with this scale (Viac and Fraser, 2020), item 10 revealed a higher extraction value in factor 1 (Mentwb). We have followed this result, keeping item 10 in the mental wellbeing dimension. The two factors identified have theoretical and empirical relevance and explain 63 % of the total variance (Shrestha, 2021).

Regarding the QSBED descriptive statistics were calculated for all items. On a 4-point interval scale, item *4. I am good at helping students learn new things* −3.28 and item *8. I feel like my teaching is effective and helpful* −3.15 were the items with higher average response rates. The remaining six items are distributed, in descending order, as follows: *6. I have accomplished a lot as a teacher*—3.07; *3. I can really be myself at this school*—2.96; *2. I am a successful teacher*—2.95; *1. I feel like I belong at this school*—2.94; 7. *I am treated with respect at this school*—2.83; *5. I feel like people at this school care about me*—2.48.

TABLE 2 QBEFM structure matrix–extracted values after rotation.

	Mentwb	Physwb
1. Headache	0.612	**0.701**
2. Stomach pain	0.424	**0.773**
3. Back pain	0.477	**0.677**
4. Feeling down	**0.869**	0.547
5. Irritability	**0.845**	0.394
6. Feeling nervous	**0.887**	0.511
7. Fatigue	**0.772**	0.567
8. Feeling dizzy	0.449	**0.770**
9. Feeling anxious	**0.852**	0.582
10. Sleep deprivation	**0.665**	0.516

Extraction method: principal component analysis. Rotation method: oblimin with Kaiser normalization. Bold values represent the distribution of the items per factor (Mentwb or Physwb).

We verified the suitability of the QSBED data for Factor Analysis by running Bartlett's Test of Sphericity and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy. The calculated output values indicated that the data is appropriate for Factor Analysis–the Kaiser–Meyer–Olkin measurement value (KMO = 0.877) and Bartlett's test of sphericity (p-value = 0.00) (Revelle, 2016).

To assess the QSBED internal consistency and reliability we used Cronbach's alpha measure (Tavakol and Dennick, 2011). The resulting coefficient of reliability was 0.87 for the total of the scale, 0.87 for factor 1 (SC), and 0.82 for factor 2 (TE).

The QSBED factor analysis identified two factors (**Table 3**), likewise in the original study with this scale (Renshaw, 2020). Factor 1—School Connectedness (SC) (items—1, 3, 5 and 7); Factor 2—Teaching Efficacy (TE) (items—2, 4, 6 and 8). The two factors identified have theoretical and empirical relevance and explain 69.7 % of the total variance (Shrestha, 2021).

After having carried out an exploratory factor analysis of the two questionnaires, we took the four factors extracted from the two questionnaires and developed a correlation matrix between factors. The results obtained are in **Table 4**.

School connectedness relates positively with Teaching efficacy ($r = 0.552$, $p < 0.01$). The same positive correlation occurs between physical wellbeing and mental wellbeing ($r = 0.683$, $p < 0.01$). A negative correlation is observed between School connectedness with both physical and mental wellbeing ($r = -0.344$ and $r = -0.458$, $p < 0.01$). The same negative correlation is observed between teaching efficacy and physical and mental wellbeing ($r = -0.189$ and $r = -0.304$, $p < 0.01$). These negative correlations between the factors in the QBEFM and QSBED were expected since the QBEFM (physical and mental wellbeing assessment scale) has

TABLE 3 QSBED structure matrix–extracted values after rotation.

	SC	TE
1. I feel like I belong at this school	**0.854**	0.346
2. I am a successful teacher	0.542	**0.795**
3. I can really be myself at this school	**0.820**	0.559
4. am good at helping students learn new things	0.298	**0.831**
5. I feel like people at this school care about me	**0.850**	0.375
6. I have accomplished a lot as a teacher	0.461	**0.766**
7. I am treated with respect at this school	**0.869**	0.460
8. I feel like my teaching is effective and helpful	0.375	**0.825**

Extraction method: principal component analysis. Rotation method: oblimin with Kaiser normalization. Bold values represent the distribution of the items per factor (SC or TE).

TABLE 4 Correlation matrix between the four factors.

	SC	TE	Physwb	Mentwb
SC	1	0.552**	−0.344**	−0.458**
TE		1	−0.189**	−0.304**
Physwb			1	0.683**
Mentwb				1

**The correlation is significant at the 0.01 level.

the highest numerical value as a more negative connotation (poor wellbeing) than the lowest numerical value (high-level wellbeing). Consequently, values of a negative correlation occurred with the factors in the QSBED (School connectedness and Teaching efficacy), whereas the items in the scale with higher numerical values have a positive response connotation. This means that poor physical wellbeing and poor mental wellbeing are related to low levels of school connectedness and low levels of teaching efficacy. Additionally, the results show that mental wellbeing has even stronger numerical values than physical wellbeing when related to school connectedness and teaching efficacy.

Following factor analysis on the two questionnaires, we decided to carry out an exploratory study to identify significant differences between the four dimensions of wellbeing about the sociodemographic variables considered for this research.

Normality and homogeneity of the sample variances were tested using the Kolmogorov-Smirnov test and Levene's test, observing these assumptions only for Mentwb per district. Thus, the ANOVA test was applied to verify the existence of significant differences for Mentwb by district and the Kruskal–Wallis's test to identify significant differences in all other dimensions and sociodemographic variables.

The relationship between the average score of the four dimensions identified with years of service, education sector, age, academic qualifications, and district is presented in **Table 5**.

Preschool teachers over 40 years of age had a significantly higher score than colleagues aged 40 years and under in TE (p-value = 0.04). The same result occurs with preschool teachers with over 25 years of experience when compared to colleagues with less than 25 years of service (p-value = 0.047). Preschool teachers from the Porto and North Region had significantly higher scores than colleagues from the other Portuguese geographic areas in the Mentwb dimension, with the most significant difference observed with colleagues from the Lisbon area (p-value = 0.03).

Discussion

The aims of our study were twofold: (i) to investigate correlations between physical and mental wellbeing, teaching efficacy and school connectedness, and (ii) to explore the relationship between those dimensions and sociodemographic variables such as age, teaching experience, academic qualifications, education sector, and geographical regions.

The results of our study point to the existence of a positive relationship between physical and mental wellbeing. These results echo evidence in the literature for a positive correlation between physical indicators (e.g., increased stress, altered sleep patterns) and mental indicators (e.g., personal development, life purpose and interpersonal relationships) (Cumming and Wong, 2018). The interaction between physical and mental wellbeing is a complex and holistic relationship (Huang and Yin, 2018; Cumming and Wong, 2018; Ingriselli and Schempp, 2019). Berger et al. (2022) reinforce the idea that educators' wellbeing is affected not only by individual factors but also by contextual, relational and systemic factors, leading educators to situations of stress and exhaustion. Individual factors (e.g., trust level), organizational factors (e.g., school climate), and social factors (e.g., assessment of professional performance) influence educators' wellbeing Berger et al. (2022). Such factors have an impact on professional performance and career retention (Cumming and Wong, 2018; Ingriselli and Schempp, 2019).

Regarding physical wellbeing, studies with preschool teachers have shown that the demands of their work, particularly in daily routine tasks such as organizing and tidying up equipment in the classroom and outside spaces, bending down and squatting to children's height, sitting on the floor or in small chairs have an impact on teachers' global health (Cumming and Wong, 2018). The authors indicate that stress, injuries, and low health indicators are risky factors for preschool teachers which justifies the results on physical wellbeing observed in this study. As far as mental wellbeing is concerned, studies with preschool teachers have revealed various challenges and stressors that they face in their daily routines, which involve responding to the different needs of children, interpersonal relationships and expectations of families and colleagues, time pressure, and accommodating the demands of work with personal life (Huang and Yin, 2018; Ingriselli and Schempp, 2019; Berger et al., 2022). The results of mental wellbeing in our study follow the challenges stated by preschool teachers in previous studies. The central role of the school in supporting children's emotional wellbeing has led to an increased level of responsibility for preschool teachers thus increasing their levels of stress and exhaustion (Huang and Yin, 2018).

Wellbeing has also been related to other relevant variables. Our study, like previous studies (e.g., Guo et al., 2011; Cansoy et al., 2020; Lipińska-Grobelny and Narska, 2021), suggests that teacher efficacy can be positively associated with teachers' physical and mental wellbeing. Cansoy et al. (2020) concluded that "teachers' perceptions of high self-efficacy was an important behavioral factor in ensuring their psychological wellbeing, providing meaningful

TABLE 5 Relationship between dimensions of wellbeing and sociodemographic variables.

	SC	p	TE	p	Physwb	p	Mentwb	p
Years of service		0.42		**0.047***		0.96		0.97
> 15	11.28 (3.26)		12.04 (2.35)		10.24 (2.89)		18.08 (5.07)	
15–25	10.92 (3.10)		12.42 (2.18)		10.38 (3.71)		17.91 (6.17)	
> 25	11.67 (2.96)		12.73 (2.30)		10.11 (3.43)		17.45 (5.78)	
Education sector		0.97		0.07		0.37		0.88
Public	11.32 (3.03)		12.78 (2.15)		10.10 (3.72)		17.98 (6.51)	
IPSS	11.19 (3.26)		12.24 (2.33)		10.60 (3.32)		17.94 (5.49)	
Private	11.14 (3.29)		12.27 (2.40)		10.16 (2.98)		17.74 (4.88)	
Age		0.77		**0.04***		0.76		0.29
20–40	11.21 (3.29)		11.98 (2.29)		10.47 (3.04)		18.65 (5.32)	
41–50	11.13 (2.94)		12.69 (2.13)		10.13 (3.43)		17.33 (5.84)	
More than 50	11.34 (3.27)		12.58 (2.37)		10.38 (3.66)		17.89 (6.02)	
Academic qualifications		0.42		0.64		0.95		0.81
Bachelor	11.16 (3.17)		12.39 (2.22)		10.29 (3.43)		17.98 (5.82)	
Master	11.53 (3.06)		12.58 (2.31)		10.38 (3.37)		17.94 (5.79)	
Other	10.82 (3.52)		12.58 (2.76)		0.36 (3.70)		17.27 (5.68)	
District		0.64		0.44		0.19		**0.03***
Porto and North	10.92 (3.13)		12.17 (2.33)		10.99 (3.47)		19.51 (5.77)	
Center region	11.35 (3.37)		12.63 (2.17)		10.65 (3.58)		18.62 (6.11)	
Lisboa area	11.38 (3.13)		12.55 (2.26)		9.94 (3.25)		17.21 (5.32)	
Alentejo and Algarve	11.21 (3.04)		12.57 (2.47)		10.36 (3.56)		17.60 (6.83)	
Madeira and Açores	10.39 (3.47)		11.67 (2.35)		10.83 (4.06)		17.50 (6.62)	

*The correlation is significant at the 0.05 level. Bold values represent that are a significant correlation between the variables (years of service with factor TE; Age with factor TE; and District with factor Mentwb).

answers to the question 'why do I do this job?'" (p. 49). As has been mentioned, the teaching profession has been associated with some vulnerability and a high level of stress, which often result in exhaustion, job dissatisfaction, mental health problems and even leaving the profession (Vesely et al., 2013; Viac and Fraser, 2020). Vesely et al. (2013) emphasize that the way teachers can use their resources and draw upon support helps them to cope with professional demands and increases teacher efficacy. This, in turn, is influenced by the interaction between internal factors (e.g., self-concept and resilience) and external factors (e.g., class size, administrative support), which can be limited by social and contextual settings, and therefore affecting the individual's mental health and wellbeing (Vesely et al., 2013). Peng et al. (2022) also point out that teaching efficacy plays a mediating role in the relationship between teacher autonomy and mental health. Professional autonomy can give teachers a sense of control and the opportunity to realize their values, improving teaching effectiveness and increasing their sense of competence, which is crucial for professional wellbeing.

Our results also reveal a positive association between connectedness and teacher efficacy. This evidence is in line with Balfanz (2023) idea that teachers who engage in teamwork reveal a high sense of collective efficacy and tend to value opportunities to collaborate with and learn from their peers. These collaborative behaviors favor the quality of interpersonal relationships, increasing preschool teachers' engagement and job satisfaction. For Roffey (2013), the establishment of positive social relationships allows opportunities for collaboration and for broadening one's potential to achieve common goals. The need to relate to others is crucial to ensure wellbeing (Balfanz, 2023). Being able to establish and maintain positive social connections has numerous benefits, including helping to create bonds with others and feeling accepted by their social group. The feeling of belonging has been increasingly recognized as a protective factor for resilience, and a critical factor for the promotion of physical and mental wellbeing and teacher efficacy (Roffey, 2013; Viac and Fraser, 2020). The authors point out that when teachers feel supported by their colleagues and principals, they tend to have a higher sense of professional wellbeing, feel greater self-efficacy and less pressure at work, and cope better with external pressure.

The school connectedness variable appears in our study, and in the studies mentioned above, as a critical aspect for understanding teacher wellbeing. While this variable has been studied extensively with adolescents (e.g., McNeely and Falci, 2004; St-Amand et al., 2017) it has been addressed in a small number of studies with school and preschool teachers (e.g., Roffey, 2013; Balfanz, 2023).

The correlations found in the empirical literature between physical and mental wellbeing, teaching efficacy and school connectedness with sociodemographic variables indicate that there are significant associations between age and professional experience with teaching efficacy.

Huang and Yin (2018) point out that teachers with more years of experience tend to make use of a more diverse repertoire of teaching and classroom management strategies as they feel more comfortable, confident, and familiar with more innovative pedagogical practices. These results appear to indicate the existence

of distinct patterns of the efficacy of older and more experienced preschool teachers in making informed choices of teaching and classroom management strategies (Avey et al., 2011; Ferreira, 2022). In contrast, teachers at an early stage in their careers feel greater relational and emotional pressure and lower values of wellbeing and self-efficacy (Huang and Yin, 2018).

Finally, we found differences among teachers from different districts in Portugal. Our results indicate that preschool teachers from the Porto and Northern regions of Portugal revealed higher levels of mental wellbeing than preschool teachers from other regions of Portugal with the biggest difference in the Lisbon area. According to Kingsford-Smith et al. (2023), it is currently unclear what role geographical area plays and what kind of associations there are with teacher wellbeing. Their study analyzed the similarities and differences in the relationship between work demands/resources, self-efficacy and teacher wellbeing in rural, regional and metropolitan areas of Australia, and concluded that workload and teacher collaboration were predictive of teacher wellbeing in all locations. Like Kingsford-Smith et al. (2023) we also advocate further studies with more robust samples to ascertain the representativeness of teachers from different districts of the country to clarify the associations between geographical area and physical and mental wellbeing.

Limitations of the study

The two scales used in this study are Likert scales. It is known that these scales have some limitations and can oversimplify the complexity and diversity of the phenomena under analysis, forcing participants to select between a limited set of options (Tanujaya et al., 2023). Likert scales can also introduce measurement errors, such as social desirability or central tendency biases, and can also be influenced by the wording, order, and number of items in the scale (Kreitchmann et al., 2019). It is suggested that the data collected and analyzed in this study be further explored in future qualitative research.

Practical implications/conclusion

Investigating and understanding the relationships between teacher wellbeing, teaching efficacy and school connectedness is an important endeavor. Besides the impact on individuals, early educator wellbeing also influences children and can have important long-term consequences.

As regards the personal growth and development of preschool teachers, our results indicate a need to focus on less experienced preschool teachers through mentoring programmes and supervision practices (Manasia et al., 2019). School and educational leaders have a critical role in developing projects and initiatives to promote a positive school climate (Reis-Jorge et al., 2024) and consequently preschool teachers‘ wellbeing.

The findings suggest that younger and less experienced preschool teachers struggle to have confidence in their teaching efficacy. Given the influential relationship between teaching efficacy and physical and mental wellbeing, it is worth investing in supervision practices to strengthen teaching competencies. Through supporting educators' reflection processes on their practice (Atay, 2007) supervisors can have a crucial role in the professional growth and development of preschool teachers. After the completion of pre-service education, there is often a lack of opportunity for further regular exchange of experiences and peer feedback (Vasquez et al., 2016). Ferreira (2022) claims that "[a] teacher who reflects on their practices and who discusses with peers daily professional challenges is closer to achieving wellbeing" (p. 121).

Our findings also point to a close relationship between school connectedness and teaching efficacy. Several studies have shown that teachers who experience more School connectedness are more prone to creating more authentic relationships and fostering an environment based on psychological safety with implications on their wellbeing, self-efficacy, and lower levels of work-related stress (Lupaş et al., 2023; Heikonen et al., 2024).

Our study showed that in some regions of Portugal, the preschool teachers‘ level of mental wellbeing is higher than in other regions. This is in line with the findings of Kingsford-Smith et al. (2023) on teacher wellbeing in rural, regional, and metropolitan schools in Australia, which showed that teachers' working conditions (differences in workload and student behavior across locations) impact negatively on teacher wellbeing; conversely, teacher collaboration has a positive impact on teacher wellbeing. In the Portuguese case, in subsequent studies, it would be interesting to explore possible differences across regions in preschool teachers‘ mental wellbeing.

Considering the associations between wellbeing, teaching efficacy and school connectedness, the contribution to knowledge made by this study is the relevance of our findings to inform the inclusion of these concepts and interrelated dimensions in preschool teachers' initial training and continuing professional development initiatives. In this sense, preschool teachers must share and question their practice reflectively and collaboratively, in a situated and protective learning environment as a path for personal and professional growth. According to Pagán-Castaño et al. (2021), interventions with preschool teachers should emphasize the need to generate sustainable and healthy environments where high levels of wellbeing can be promoted and achieved.

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 were not required for the study on human participants following the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. 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

MF: Conceptualization, Data curation, Methodology, Project administration, Writing – original draft, Writing – review & editing. AB: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. JR-J: Conceptualization, Data curation, Methodology, Writing – original draft, Writing – review & editing. PP: Conceptualization, Data curation, Methodology, Writing – original draft, Writing – review & editing. RB: Conceptualization, Data curation, Methodology, Writing – original draft, Writing – review & editing. IB: Conceptualization, Data curation, Methodology, 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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