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ORIGINAL PAPER

Examining the Links Between Positive Mental Health and Mindful Parenting During COVID-19 Pandemic in a Sample of Portuguese New Mothers: The Mediating Role of Parenting Stress

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Abstract

Objectives This study aimed to explore the association between positive mental health and mindful parenting among Portuguese new mothers by analyzing the mediating role of parenting stress. The moderating role of the perceived impact of COVID-19 on this association was also explored.

Method Sample collection occurred between November 2020 and March 2021. Data from 142 women with a child aged up to 2 years old were collected online through self-report measures. Simple mediation and moderated mediation models were employed while controlling for maternal sociodemographic and health-related data.

Results After controlling for the number of children and clinically significant symptoms of anxiety and depression, lower levels of maternal positive mental health were associated with lower levels of mindful parenting through higher levels of parenting stress. The association between positive mental health and parenting stress was more pronounced when mothers perceived the impact of COVID-19 as negative.

Conclusions Our results suggest the relevance of positive dimensions of maternal mental health during early parenting. These appear to contribute to parenting stress, especially under stressful perceived circumstances such as those related to the COVID-19 pandemic, and to maternal mindful parenting skills. It seems important to assess and intervene early in women's positive mental health and parenting stress, even in the absence of psychopathology, so that new mothers are more likely to adopt adaptive parenting approaches, such as mindful parenting.

Preregistration This study is not preregistered.

Keywords COVID-19 pandemic · Mindful parenting · New mothers · Parenting stress · Positive mental health

A large body of research grounded in developmental psychology and attachment theory (Ainsworth & Bowlby, 1991; Belsky & Fearon, 2002; Sroufe, 2005) attests to the importance of early parenting on individuals' adjustment throughout the life cycle (Coatsworth et al., 2018; Harmeyer et al., 2016; Medeiros et al., 2016; Miller et al., 2011). Particularly during the first 2 years of life, children undergo exponential physical, cognitive, linguistic, emotional, and social development (Berk & Meyers, 2016). This development occurs within a context of high dependence on their parents and the dynamics established with them (Rosenblum et al., 2009), which can determine the child's future adaptation (Bornstein, 2002). Simultaneously, new mothers must adapt themselves to the individual, relational, and social demands of parenting (Akiki et al., 2016). They often experience low levels of well-being and high levels of anxious and/or depressive symptoms and parenting stress (Fernandes et al., 2020; Monteiro et al., 2020a). According to previous research, maternal mental health difficulties associated with early parenting demands tend to decrease only 2 years after a child's birth (Stone et al., 2016; Williford et al., 2007) and may negatively impact new mothers' approaches to parenting, namely their mindful parenting skills (Fernandes et al., 2021a; Richardson et al., 2020).

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Since March 2020, the COVID-19 pandemic has added new challenges to early parenting (e.g., changes in family routine, reduction of social support networks and consequent greater exclusivity of parent–child interactions, school closures and remote working while parenting). These new challenges seem to increase new mothers' likelihood of experiencing compromised mental health outcomes (Davenport et al., 2020) and to impact their parenting (Vescovi et al., 2021). However, research efforts aimed at examining the links between maternal mental health and new mothers' approaches to parenting, such as mindful parenting, remain scarce (e.g., Caiado et al., 2020; Fernandes et al., 2021a), particularly during situations that are perceived as stressful, such as the COVID-19 pandemic (Potharst et al., 2020). Greater knowledge about this topic would be helpful to inform future interventions for new mothers focused on promoting adaptive parenting under adverse public health circumstances.

Mindful parenting is a parenting approach that incorporates mindfulness into the parent–child interaction (Bogels et al., 2014) and reflects the parent's ability to interact with the child in a more present, accepting, emotionally connected, and compassionate way (Coatsworth et al., 2018). This approach to parenting includes dimensions that focus on listening with full attention (i.e., directing full attention to the child and being present during interactions), compassion for the child (i.e., acting in a kind manner that is supportive, responsive and sensitive to the child and his or her needs), self-regulation in parenting (i.e., being able to pause before reacting and to act according to one's values and goals but not impulsively), nonjudgmental acceptance of parental functioning (i.e., accepting the characteristics and behaviors of the child and oneself as a parental figure as well as the challenges of parenthood), and emotional awareness of the child (i.e., noticing and identifying the emotions the child is feeling) (Duncan et al., 2009; Kabat-Zinn & Kabat-Zinn, 1997).

Mindful parenting has been shown to increase the quality of the parent–child relationship (Medeiros et al., 2016). This is achieved by promoting positive parenting practices (Coatsworth et al., 2018; Duncan et al., 2009). Similar to previous findings for parents of older children (Coatsworth et al., 2018; Moreira & Canavarro, 2017, 2018), recent research has found that higher levels of mindful parenting in new mothers are associated with higher levels of self-efficacy, self-compassion (Perez-Blasco et al., 2013), responsivity, positive affect (Potharst et al., 2017), dyadic synchrony (Potharst et al., 2020) and lower levels of hostility (Potharst et al., 2017).

However, less is known about the underlying mechanisms of mindful parenting, particularly during early parenting (Fernandes et al., 2021a). A better understanding of these mechanisms would be helpful to identify specific targets for future interventions aimed at promoting more adaptive parenting for the early years of childhood.

Maternal mental health is widely considered one of the factors closely associated with adaptive parenting. For instance, the presence of depressive and/or anxious symptomatology in mothers of children across all age groups has been associated with less adaptive parenting practices (S. H. Goodman et al., 2017; Lovejoy et al., 2000). In new mothers, significant levels of anxious and/or depressive symptoms seem to be associated with greater difficulty in adopting sensitive and responsive parenting and with fewer mindful parenting skills (Caiado et al., 2020; Fernandes et al., 2021a). The presence of anxious and/or depressive symptomatology has also been associated with a lower quality of the mother–child relationship (Binda et al., 2019) and an increased risk of harmful parenting practices, such as those characterized by hostility and dysfunctional interactions (Goodman et al., 2017).

However, recent studies of new mothers have gone beyond the presence versus absence of maternal psychopathology to focus on the concept of positive mental health. Positive mental health is a separate yet related concept to mental illness; it results from the conceptualization of mental health as a complete state that goes beyond the absence of psychopathology (Keyes, 2005; Monteiro et al., 2020a). Positive mental health presupposes the presence of positive dimensions of mental health, namely, psychological, emotional, and social well-being (Keyes, 2002; Ryff, 1989). These dimensions describe a person's experience in daily life. Individuals with high levels of psychological well-being like themselves, have relationships based on trust, try to improve, adapt to meet their needs and are self-determined. Individuals with high levels of emotional well-being experience positive affect, the absence of negative affect, and the perception of satisfaction with life. Individuals with high levels of social well-being feel accepted by their communities, perceive themselves as an integral and contributing part of a society with which they broadly agree, and have the potential to evolve positively (Keyes, 2002). Positive mental health has been increasingly studied, and some interventions for new mothers have included its promotion (e.g., Lapshina et al., 2019; Monteiro et al., 2020b). These interventions are supported by international policies (Barry et al., 2019; Forsman et al., 2015) and global health authorities (e.g., World Health Organization, 2004).

Higher levels of positive mental health have been associated with better individual adjustment in situations of perceived stress, which may be due to more functional coping mechanisms (Truskauskaite-Kuneviciene et al., 2022). Higher levels of positive mental health also seem to be associated with protective mechanisms against early maternal maladjustment (Monteiro et al., 2020a) and child development (Phua et al., 2017). In a longitudinal study by

Phua et al. (2017), higher levels of positive maternal mental health in the perinatal period were associated with better child developmental outcomes at 24 months after birth with regard to cognitive, communicative, and social development. Although the mechanisms behind the association between positive maternal mental health and the developmental outcomes of the child are not yet well known (Phua et al., 2017), the authors suggest that higher levels of positive mental health in new mothers may be associated with more adaptive parenting approaches (Phua et al., 2020), thus influencing the child's development.

Parenting stress is experienced when parents perceive that the demands of parenting exceed their personal and social resources (Abidin, 1992). It is generally considered a risk factor for harmful parenting practices (Anthony et al., 2005). Previous research suggests that parenting stress is influenced by factors related to the child (e.g., temperament and behavior), the surrounding context (e.g., marital relationship, social support) and, of particular interest for our study, the parent (e.g., psychological well-being) (Abidin, 1992; Fernandes et al., 2021a).

The association between maternal mental health and mindful parenting in new mothers has been explained through the higher levels of parenting stress felt by women with clinically significant depressive and/or anxious symptomatology and the association between these higher levels of parenting stress and lower levels of mindful parenting (Fernandes et al., 2021a; Williford et al., 2007). Although the data on the association between positive mental health and parenting stress are preliminary, lower levels of positive mental health appear to be associated with higher levels of parenting stress in clinical and community samples (Pisula & Barańczuk, 2020). Considering previous evidence regarding the protective role of positive mental health when facing perceived stressful situations (Teismann et al., 2018; Truskauskaite-Kuneviciene et al., 2022), this association is expected in early parents, a group particularly exposed to stress, especially during the COVID-19 pandemic (Fernandes et al., 2021a; Williford et al., 2007).

The association between new mothers' positive mental health and parenting stress is also of particular relevance because several studies suggest that parenting stress impacts development beginning with early life (Dau et al., 2019) through its influence on parenting (Stelter & Halberstadt, 2011). However, the association between parenting stress and mindful parenting has been researched mainly among parents of older children and adolescents (e.g., Moreira & Canavarro, 2018). To our knowledge, few studies have focused on new mothers (e.g., Fernandes et al., 2020b; Fonseca et al., 2015). Although parenting stress levels seem to be associated with the developmental stage (Stone et al., 2016; Williford et al., 2007), the association between parenting stress and mindful parenting appears to be significant across different age groups (Corthorn & Milicic, 2016; Fernandes et al., 2021a; Gouveia et al., 2016).

More information regarding the plausible association between positive mental health, mindful parenting and parenting stress among new mothers would clarify the relevance of interventions to promote higher levels of positive maternal mental health (rather than just the prevention/treatment of psychopathology) as well as the relevance of interventions aimed at reducing parental stress among new mothers with compromised levels of positive mental health. If these interventions could improve mindful parenting skills, they may contribute to the quality of parent–child relationships and, consequently, to children's development and health (Dau et al., 2019; Vismara et al., 2016).

In March 2020, the World Health Organization declared COVID-19 a pandemic and, since then, governments adopted necessary measures to contain its spread. In Portugal, these measures resulted in nationwide lockdowns, subsequent recommendations to stay at home for long periods of time, and temporary closure of nonessential businesses and schools, forcing people to resort to telework and distance learning.

The time of uncertainty caused by COVID-19 pandemic has been associated with higher levels of stress and other poor mental health outcomes in the general population (Paulino et al., 2021) and among specific vulnerable groups, such as pregnant and postpartum women (Thapa et al., 2020). Several studies have found that the pandemic is associated with higher levels of anxious and depressive symptoms (Davenport et al., 2020; Mei et al., 2021), stress (McMillan et al., 2021; Mei et al., 2021), and parenting stress (Coyne et al., 2021; Fernandes et al., 2021b) in new mothers.

Most of the pandemic-related literature has noted the greater influence of the perceived negative impact of COVID-19 (i.e., participants' subjective evaluations) on mental health indicators when compared to the impact of objective circumstances associated with the pandemic (e.g., infection, unemployment, relatives lost). In circumstances that are perceived as particularly harmful and stressful, higher levels of parenting stress and additional difficulties in adopting a mindful parenting approach are expected (Fernandes et al., 2021a), particularly when maternal mental health is already compromised.

The main aim of the present study was to explore the association between positive mental health and mindful parenting in new mothers (i.e., mothers of children aged up to 2 years) by evaluating the potential mediating role of parenting stress on this association. Research suggests that (1) higher levels of positive mental health may be associated with lower levels of parenting stress and more adaptive parenting practices (Pisula & Barańczuk, 2020) and that (2) lower levels of parenting stress may be associated with higher levels of mindful parenting (Fernandes et al., 2021a). Therefore, it is hypothesized that higher levels of positive maternal mental

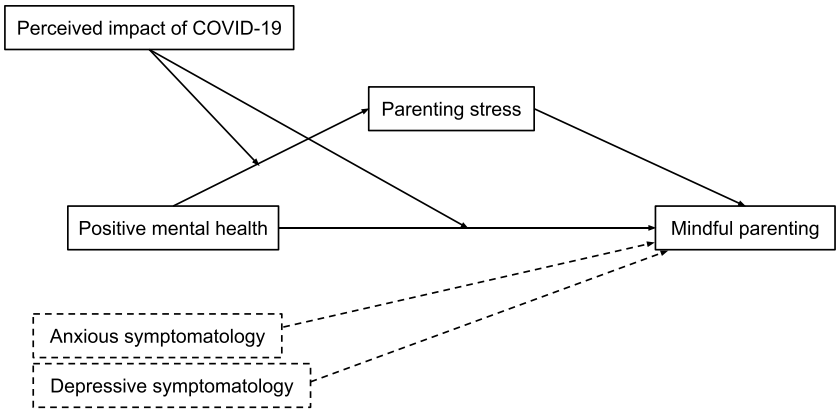

Fig. 1 Proposed conceptual model of the associations between positive mental health, parenting stress, and mindful parenting, while controlling the anxious and depressive symptomatology and attending to the potential moderating effect of the perceived impact of COVID-19

health may be associated with higher levels of mindful parenting through lower levels of parenting stress.

Based on the literature that attests that positive mental health is a distinct concept from the absence/presence of psychopathology (Keyes, 2005; Monteiro et al., 2020a), it is hypothesized that the relationship between positive mental health, parenting stress and mindful parenting occurs regardless of the presence/absence of anxious and/or depressive symptomatology. Maternal anxiety and/or depressive symptoms are expected during early parenting (Epifanio et al., 2015; Goodman, 2004). These symptoms can influence parenting stress (Williford et al., 2007) and mindful parenting (Fernandes et al., 2021a; Pisula & Barańczuk, 2020) and should be controlled for when testing the proposed conceptual model.

Due to the stress-inducing characteristics of the COVID-19 pandemic, the new mothers' perceived impact of COVID-19 should also be controlled for in the proposed conceptual model (Fig. 1). Families were faced with profound changes and challenges due to government-mandated restrictions. Mothers' perceived impact of these changes associated with the COVID-19 pandemic may affect the associations between the study variables. Specifically, given the buffering effect of positive mental health in stress-inducing situations (Truskauskaite-Kuneviciene et al., 2022), it is hypothesized that a more negative perceived impact of COVID-19 translates into a stronger association between positive mental health and parenting stress, and between positive mental health and mindful parenting

Method

Participants

The sample included 142 Portuguese mothers with a child aged up to 2 years. Mothers were on average 34.65 years old (*SD* = 5.31), with ages ranging from 21 to 50 years old. Their children were on average 11.72 months old, (*SD* = 6.73), with ages ranging from 0 to 23 months old. Most mothers reported being married or living with a partner, having completed higher education, living in an urban area, and having one child on average. Participants' sociodemographic and health-related data are presented in Table 1.

Procedure

Enrollment for the present cross-sectional study occurred between September 2020 and April 2021. The sample was collected online through a data collection website (LimeSurvey) housed on the host institution's website. A Facebook page was explicitly created for the study that focused on themes of parenting and recruitment. Several advertisements were posted on that page and other Facebook pages and groups focused on early parenting, schooling, and other topics related to infants, including the web link to the survey hosted on LimeSurvey. Recruitment also occurred through e-mails sent to potential participants by educational, social and community institutions (research partners) and by the research team. The first page of the assessment protocol detailed the study's main objectives, inclusion criteria, ethical standards, and data protection policy when accessing the link. The participants were informed that their participation was voluntary, anonymous, and confidential. Only the participants who agreed to the study conditions and provided their informed consent by selecting the "Yes, I authorize" option completed the protocol. The inclusion criteria for this study were (i) being a woman, (ii) being at least 18 years of age, (iii) having at least one child under 24 months of age and (iv) living in Portugal. No exclusion criteria were applied.

Measures

A self-report questionnaire assessing sociodemographic data about the participants (e.g., age, schooling, area of residence), household (number of children), and their children (e.g., age, gender, diagnosed problems) was developed by

Table 1 Participants' sociodemographic and health-related data

Characteristic	*n*	%
Marital Status		
Single	25	17.60
Divorced/Separated	1	0.70
Married/living with a partner	116	81.70
Number of children		
Only one child	85	59.90
More than one child	47	40.10
Educational qualifications		
Basic or secondary education	24	16.10
Higher education	118	83.20
Area of residence		
Rural	39	27.50
Urban	103	72.50
Reproductive history		
Diagnosis of infertility/sterility [a]	10	7
Unviable pregnancy/birth [a]	26	18.30
Pregnancy/childbirth-related complications [a]	14	9.90
Other [a]	6	4.20
History of physical health problem [a]	24	16.90
History of psychological and/or psychiatric problem [a]	32	22.50
History of psychological and/or psychiatric treatment [a]	7	4.90
History of psychiatric medication [a]	5	3.50
Anxious symptomatology		
Clinically significant	23	16.20
Not clinically significant	119	83.80
Depressive symptomatology		
Clinically significant	15	10.60
Not clinically significant	127	89.40
COVID-19 related		
History of infection [a]	8	5.63
Part of the population at risk [a]	20	14.08
Lost someone close due to infection [a]	2	1.41
Was isolated from her child [a]	12	8.45
Infants' sex		
Male	55	59.10
Female	38	40.90
Infants' health-related difficulties		
Physical or mental disability [a]	1	0.70
Diagnosis of physical health problem [a]	3	2.10
Other [a]	1	0.70

$n = 142$

[a] Reflects the number and percentage of participants answering "yes" to this question

the researchers. This questionnaire also included participants' health-related data, namely, general health (history of physical, psychological and/or psychiatric problems, psychological and/or psychiatric treatment and psychiatric medication) and obstetric health (e.g., whether the participant had experienced an unviable pregnancy or medical complications with pregnancy and/or birth). The questionnaire also contained a section focusing on the COVID-19 pandemic that asked whether the participant had a history of COVID-19 infection, had been identified as part of the population at risk of developing severe illness from COVID-19, had lost someone close to her due to COVID-19 or had been isolated from her child due to COVID-19-related causes.

The perceived impact of COVID-19 was assessed with eight items. Participants answered the question "Please rate the impact that the COVID-19 pandemic has had/has on each of the following areas of your life" with regard to (1) physical health, (2) psychological health, (3) work or financial stability, (4) relationship with friends, (5) relationship with extended family, (6) relationship with the partner, (7) relationship with the child and (8) how she exercised her role as a mother. The questions were answered on a 5-point scale ranging from 1 (*very negative impact)* to 5 (*very positive impact*). A global score was obtained from the mean of the items ranging from 1 to 5. A higher score indicated a more positive perceived impact, while a lower score indicated a more negative perceived impact. In the present sample, this scale of adjectives presented a Cronbach's alpha of 0.65 and a McDonald's omega of 0.54.

The Portuguese version of the Interpersonal Mindfulness in Parenting Scale – Baby (IM-P-B) (Caiado et al., 2020; Duncan et al., 2009) was used to assess mindful parenting among the infants' mothers. The IM-P-B is a 30-item self-report instrument that is scored on a 5-point Likert scale ranging from 1 (*never true*) to 5 (*always true*). This instrument measures five dimensions of mindful parenting during the first months of the baby's life: listening with full attention (5 items; e.g., "I find myself paying little attention to my baby because I am busy doing or thinking about something else at the same time"), compassion for the child (3 items; e.g., "I am kind to my baby when he or she is tearful, restless or upset with something"), self-regulation in parenting (8 items, e.g., "When I am upset with my baby, I notice how I am feeling before I take action"), nonjudgmental acceptance of parental functioning (7 items; e.g., "I tend to criticize myself for not being the kind of parent I want to be"), and emotional awareness of the child (5 items; e.g., "It is hard for me to tell what my baby is feeling"). In this study, only the total score was used. Higher scores indicate the presence of higher levels of mindful parenting. The Portuguese version has adequate internal consistency, with a Cronbach's alpha coefficient of 0.84 and a McDonald's omega of 0.86 in this sample.

The Portuguese version of the Mental Health Continuum Short Form (MHC-SF) (Keyes et al., 2008; Monteiro et al., 2021) is a self-report instrument used to assess positive mental health. It comprises 14 items that analyze emotional well-being (3 items; e.g., "During the last month, how often did

you feel happy?"), psychological well-being (5 items; e.g., "During the past month, how often did you feel that you had experiences that challenged you to grow and become a better person?") and social well-being (6 items; e.g., "During the past month, how often did you feel that you belonged to a community?"). The items are rated on a 6-point response scale from 0 (*never*) to 5 (*every day*) with regard to the previous month. As recommended when using the Portuguese version, this study used the total score ranging from 0 to 70 points. The Portuguese version has adequate internal consistency levels, with the total score presenting a McDonald's omega of 0.97. In the present sample, this instrument presented a Cronbach's alpha of 0.91 and a McDonald's omega of 0.91.

The Portuguese version of the Parenting Stress Index – Short Form (PSI-SF) (Abidin, 1995; Santos, 2008) is a self-report instrument used to assess distress associated with parenting. It is organized into three domains related to the source of stress (parent, interaction, and child). The 36 items are distributed across 3 subscales with 12 items each: parental distress (e.g., "I feel trapped by my responsibilities as a parent"), parent–child dysfunctional interaction (e.g., "Sometimes I feel my child doesn't like me and doesn't want to be close to me") and difficult child (e.g., "My child makes more demands on me than most children"). The PSI-SF uses a 5-point response scale from 1 (*strongly disagree)* to 5 (*strongly agree*). In the present study, we chose to use the total score of the instrument, obtained from the sum of all items (score from 36 to 180 points). A higher total score indicates higher parenting stress levels. The Portuguese version presents adequate internal consistency levels, with a Cronbach's alpha coefficient of 0.89 for the total score. In the sample of the present study, the total score presented a Cronbach's alpha of 0.92 and a McDonald's omega of 0.92.

The Portuguese version of the Hospital Anxiety and Depression Scale (HADS) (Pais-Ribeiro et al., 2006; Snaith & Zigmond, 1994) is a 14-item self-report instrument used to assess the presence of depressive and anxious symptomatology in the previous week. This questionnaire uses a 4-point Likert scale from 0 (*not at all/only occasionally*) to 3 (*most of the time/a great deal of the time*) and 2 subscales: anxiety (7 items; e.g., "I feel tense or wound up") and depression (7 items; e.g., "I still enjoy the things I used to enjoy"). The results are analyzed using the sum of each subscale. The result of each subscale, i.e., the present symptomatology, is categorized based on the score achieved on the subscale and can be categorized as normal (0 to 7 points), mild (8 to 10 points), moderate (11 to 14 points) or severe (15 to 21 points). Higher scores on the anxiety and depression subscales indicate a greater presence of anxious and depressive symptoms, respectively. In the present study, we considered a score equal to or greater than 11 to indicate clinically significant symptomatology. The Portuguese version has adequate internal consistency levels, with Cronbach's alpha coefficients ranging from 0.76 to 0.81 for the anxiety and depression subscales, respectively. In the present study sample, Cronbach's alpha values ranged from 0.74 (depression) to 0.82 (anxiety) and McDonald's omega values ranged from 0.74 (depression) to 0.82 (anxiety).

Data Analyses

All data analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 25). Descriptive statistics (means, standard deviations, ranges, and frequencies) were used for characterization purposes. To test the associations between sociodemographic, health, and study variables (i.e., positive mental health, parenting stress, mindful parenting, and perceived impact of COVID-19), *t*-tests for independent samples and Pearson correlations were performed when the variables were categorical or continuous, respectively. Variables that were significantly associated with mindful parenting were included as covariates in the simple mediation model. The moderated mediation model was calculated considering only the covariates that were revealed to be significantly associated with mindful parenting in the simple mediation model.

The computational tool PROCESS, version 3.5.3 (Hayes, 2022), was used to calculate the simple mediation and moderated mediation models through bootstrapping and regression analysis, test the proposed direct, indirect, and conditional effects and estimate the models' coefficients. The variables were not centered, the coefficients were unstandardized, and the effect was considered significant when the 95% confidence interval obtained from bootstrapping ($N = 5000$ samples) did not include zero (Hayes, 2022).

Model 4 (Hayes, 2022), a simple mediation model, was used to test the indirect effect of positive mental health on mindful parenting through parenting stress, using the total scores of these measures. Model 4 was also used to test an alternative mediation model between the same variables, performed by removing the distress scale from the total parenting stress total score; this model intended to control for overlapping effects between mental health indicators. We also used Model 4 to explore alternative models in which the variables were associated in different directions in order to look for further evidence regarding the direction of the proposed effects. These alternative models were explored: 1.1) the association between parenting stress and mindful parenting by evaluating the potential mediating role of positive mental health in this association; 1.2.) the association between mindful parenting and positive mental

Table 2 Descriptives statistics and Pearson's correlations for the study variables

Variable	*M*	*SD*	Observed range	Possible range		PMH	PS	MP	PIC
PMH	43.43	12.16	11–67	0–70		–			
PS	69.80	18.07	38–142	36–180		−0.52**	–		
MP	111.41	10.68	87–140	30–150		0.44**	−0.56**	–	
PIC	2.56	0.40	1.29–3.50	1–5		0.27**	−0.23*	−0.01	–
Predictor					95% *CI*				
			b	*SE*	*Boot LLCI*			*Boot ULCI*	
Mediating Variable Model (Dependent Variable: PS)									
Constant			87.79	5.71	76.49			99.08	
Number of children [a]			8.03	2.54	3.01			13.06	
Anxious symptomatology [b]			8.20	3.63	1.02			15.38	
Depressive symptomatology [c]			9.95	4.36	1.33			18.56	
PMH			−0.54	0.11	−0.77			−0.32	
$R^2 = 0.36$									
Dependent Variable Model (Dependent Variable: MP)									
Constant			122.3	5.49	111.43			133.16	
Number of children [a]			−4.76	1.54	−7.8			−1.73	
Anxious symptomatology [b]			−0.3	2.16	−4.56			3.97	
Depressive symptomatology [c]			−1.03	2.59	−6.15			4.09	
PMH			0.17	0.07	0.02			0.31	
PS			−0.23	0.05	−0.33			−0.13	
$R^2 = 0.39$									

$n = 142$. Unstandardized regression coefficients are reported. *PMH* Positive mental health; *PS* Parenting stress; *MP* Mindful parenting; *PIC* Perceived impact of COVID-19 on mothers' lives; *CI* Confidence interval; *LL* lower limit; *UL* Upper limit.

[a] 0 = only one child, 1 = more than one child. [b] 0 = not clinically significant, 1 = clinically significant. [c] 0 = not clinically significant, 1 = clinically significant

*$p < 0.01$; **$p < 0.001$

health by evaluating the potential mediating role of parenting stress in this association; and 1.3.) the association between mindful parenting and parenting by evaluating the potential mediating role of positive mental health in this association.

Model 8 (Hayes, 2022), a moderated mediation model, was used to test whether the indirect effect of positive mental health on mindful parenting through parenting stress was moderated by the perceived impact of COVID-19. Indirect conditional effects on the different values of the moderator (i.e., *M*-1 *SD*, *M* and *M* + 1 *SD*) were analyzed and respectively labeled as negative, neutral, and positive impact for discussion purposes. Alternative moderated mediation models were tested by using two operationalizations of objective stress of COVID-19 as potential moderators: a count of up to four COVID-19 related stressors (i.e., having history of infection; being part of the population at risk; losing someone close due to infection; being isolated from her child) and having a history of experiencing any of the stressors mentioned (yes vs no response).

Results

Participants with only one child ($t(140) = 4.42$, $p < 0.001$) had significantly lower levels of mindful parenting. Participants with clinically significant levels of anxious symptoms ($t(140) = 2.83$, $p = 0.005$) or depressive symptoms ($t(140) = 2.67$, $p = 0.009$) had significantly lower levels of mindful parenting. No other sociodemographic or health variables were significantly associated with mindful parenting. Descriptive statistics and Pearson's correlations for the study variables are shown in Table 2.

As shown in Table 2 and schematically presented in Fig. 2, positive mental health had a negative effect on parenting stress and also a positive effect on mindful parenting after controlling for the mediating role of parenting stress. Parenting stress had a negative effect on mindful parenting. A significant indirect effect of positive mental health on mindful parenting through parenting stress was also found ($b = 0.12$, $SE = 0.03$, 95% $CI = [0.07, 0.20]$). The covariates of the number of children, anxiety and depressive symptomatology were positively associated with parenting stress,

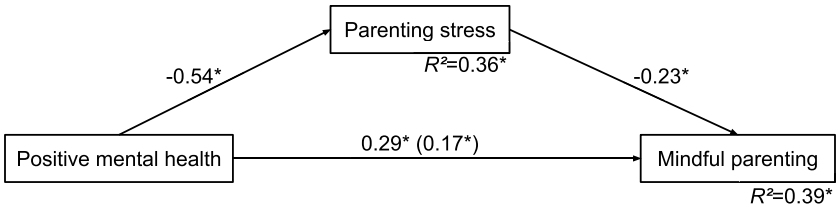

Fig. 2 Mediation model. *Note:* $n = 142$. Unstandardized coefficients for the mediation model of the association between positive mental health and mindful parenting through parenting stress, while controlling for the number of children and anxious and depressive symptomatology. The value inside parentheses represents the direct effect of positive mental health on mindful parenting after controlling for parenting stress. The value outside parentheses represents the total effect of positive mental health on mindful parenting. * Significant effects

but only the number of children was associated with mindful parenting. The mediation model was significant ($F_{5,136}$, $p < 0.001$) and explained 39% of the variance in mindful parenting ($R^2 = 0.39$). In the alternative mediation model performed by removing the distress scale from the total PSI-SF total score to control for overlapping effects between mental health indicators, no changes were found regarding the nature or size of the tested associations (data not shown). The alternative mediation models in which associations between variables were tested in different directions in order to look for further evidence regarding the direction of the proposed effects showed poorer (Model 1.1.) or equivalent performances (all the others) when compared with the indirect effect tested in the main mediation model described above (data not shown).

The perceived impact of COVID-19 was not a significant moderator of the indirect effect of positive mental health on mindful parenting through parenting stress (index of moderated mediation: $b = -0.15$, $SE = 0.09$, 95% $CI = [-0.30, 0.05]$). However, the perceived impact of COVID-19 was a significant moderator of the specific association between positive mental health and parenting stress ($b = 0.61$, $SE = 0.25$, 95% $CI = [0.12, 1.10]$). This effect increased when the perceived impact of COVID-19 was negative ($b = -0.88$, $SE = 0.14$, 95% CI [-1.14, -0.61]), although it remained significant for neutral ($b = -0.63$, $SE = 0.11$, 95% $CI = [-0.85, -0.42]$) and positive perceived impacts of COVID-19 ($b = -0.39$, $SE = 0.16$, 95% $CI = [-0.70, -0.08]$).

When comparing these results to the results obtained by moderators of objective stress, we did not find relevant changes, as the indirect effects remained to not be moderated by COVID-19 variables (data not shown).

Discussion

The present study aimed to explore the association between positive mental health and mindful parenting among new mothers by considering the potential mediating role of parenting stress. It also investigated the role of the perceived impact of COVID-19. The results corroborated the proposed associations, demonstrating that higher levels of maternal positive mental health were associated with lower levels of parenting stress and higher levels of mindful parenting. Parenting stress mediated the relationship between maternal positive mental health and mindful parenting. The perceived impact of COVID-19 moderated the association between positive mental health and parenting stress. This moderating effect was significant at any values of the moderator but was greater when the perceived impact of COVID-19 was negative rather than neutral or positive. These results contribute to a better understanding of the relationships between positive mental health, parenting stress and mindful parenting among new mothers and clarify the role of the perceived impact of COVID-19 in these relationships.

First, our results showed that higher levels of positive mental health were associated with higher levels of mindful parenting, both through indirect and direct effects. Our findings align with the literature arguing that high levels of positive mental health in new mothers may be associated with more positive parenting practices (Phua et al., 2020). Mothers with higher levels of positive mental health (i.e., mothers who experience positive affect and content in their individuality and social life (Keyes, 2005) can interact with their infant in a more present, accepting, emotionally connected and compassionate way (Coatsworth et al., 2018). This effect may partially occur through the lower levels of parenting stress experienced by these mothers. Similar to the findings of Pisula and Barańczuk (2020), our results showed that higher levels of positive mental health were associated with lower levels of parenting stress. Also, higher levels of parenting stress were associated with lower levels of mindful parenting, corroborating previous studies conducted in samples of mothers of older children and adolescents (Corthorn & Milicic, 2016; Gouveia et al., 2016) and in the postpartum period (Fernandes et al., 2021a). These associations translated into an indirect effect of positive mental health on mindful parenting through parenting stress.

The association between positive mental health and parenting stress was expected considering previous studies in which higher levels of positive mental health were associated with protective mechanisms of maternal maladjustment

(Monteiro et al., 2020a). Although the mechanisms behind this relationship are not yet known, Teismann et al. (2018), based on Fredrickson's theory (2001), suggest that the frequent daily experience of positive affect associated with higher levels of positive mental health may extend to better personal functioning, enhancing the development of adaptive personal resources such as resilience and social closeness (Fredrickson, 2013). Other authors also suggest that the frequent experience of positive affect associated with higher levels of positive mental health (Keyes, 2002; Potharst et al., 2017, 2020) may counteract anxiety cognitions by shifting the focus of attention to more positive aspects (Garland et al., 2010), leading to the use of more functional coping strategies (Truskauskaite-Kuneviciene et al., 2022) and enhancing individuals' recovery after adversity (Tugade & Fredrickson, 2004).

Our results also revealed that the effect of positive mental health on parenting stress was stronger when the impact of COVID-19 was considered negative, and its strength decreased when the perceived impact of COVID-19 was neutral or positive. Mothers with lower levels of positive mental health experienced higher levels of parenting stress, especially when the perceived impact of COVID-19 on their lives was deemed negative. Our results are congruent with the literature highlighting the particularly protective nature of positive mental health in stressful situations (Truskauskaite-Kuneviciene et al., 2022), such as pandemic contexts. In the absence of favorable mental health conditions (Abidin, 1992), the perception of a negative impact of COVID-19 may have led participants to the perception that the demands of parenthood exceeded their personal and social resources. This is comprehensible if we consider that the COVID-19 pandemic has altered the global context of parenthood. Before the pandemic, infants could attend nurseries and day care every day and maintain regular contact with grandparents and other family and/or friends, leading to a more extensive range of interactions with others. During the pandemic, these resources were unavailable, leaving parents to care for their infants (and other children) almost exclusively, leading to increased care tasks and a more extended period without breaks for personal time or the ability to reach out for social support. This experience, often accompanied by an increase in parenting and job-related obligations, could lead to higher levels of parenting stress, as shown in previous studies (Coyne et al., 2021; Fernandes et al., 2021b). It is necessary for future investigations to assess the extent to which our findings may be generalized for other stressful situations.

The association between parenting stress and mindful parenting was also expected. Parenting stress is considered a risk factor for negative parental beliefs and behaviors (Abidin, 1992; Anthony et al., 2005), which are irreconcilable with a mindful approach to parenthood. Individuals who have higher levels of parenting stress tend to react automatically and negatively when interacting with the child; their defense system is activated (Bogels et al., 2014) and they have greater difficulty self-regulating their emotions, which may be an obstacle to a compassionate and mindful parenting approach (Fernandes et al., 2021a). Thus, identifying and reducing parenting stress could lead to less emotional reactivity, allowing parents to use their knowledge and abilities to be mindful parents (Bogels et al., 2014). This hypothesis would be expected since lower levels of parenting stress are associated with more positive parenting practices (Respler-Herman et al., 2012). High levels of parenting stress appear to be characteristic of parents who seek or are referred for interventions focused on mindful parenting (Emerson et al., 2021). The present study highlights the relationship between parenting stress and mindful parenting in a less studied group (i.e., new mothers), elucidating the importance of early but continued action after the postpartum period.

Finally, the significant direct effect found between positive mental health and mindful parenting after controlling for the mediator suggests that parenting stress may be only one of the possible explanatory mechanisms of this association. According to previous research, mothers with higher levels of positive mental health may also experience other factors associated with mindful parenting, such as higher levels of self-compassion (Monteiro et al., 2020a) and self-efficacy (Perez-Blasco et al., 2013). Further studies are needed to examine these and other plausible explanatory mechanisms of the relationship between positive mental health and mindful parenting in the transition to parenthood. These mechanisms constitute critical information when planning interventions aimed at promoting more adaptive approaches to parenthood among women who present compromised levels of positive mental health.

This study adds relevant information to the existing scientific evidence about the association between maternal mental health, parenting stress and mindful parenting, also providing important guidelines for future practice in early parenthood. Although further research is needed to clarify this association and to accurately inform prevention and intervention design strategies, our findings indicate that prioritizing higher levels of positive mental health in future interventions for new mothers would allow us to identify mothers with compromised positive mental health and act early to reduce or even prevent parenting stress and, consequently, the mothers' risk of negative parenting approaches. Our findings also indicate the relevance of interventions capable of promoting positive mental health during early motherhood through their potential for reducing parenting stress and, thus, improve positive parenting practices. These results complement the literature that attests to the importance of the prevention and treatment of depressive and anxious symptomology, particularly when clinically significant, to reduce parenting stress and promote positive parenting practices while demonstrating that the impact of mental health on parenting approaches

may go beyond the absence or presence of psychopathology. In future interventions, mental health should be considered a complete state; the focus should be not only on its negative dimensions (e.g., the presence of symptomatology) but also on its positive dimensions (e.g., well-being indicators). When viewing the mental health of individuals more holistically, it may be possible to detect cases or moments in which the well-being of individuals is compromised, even in the absence of psychopathology. This would allow for early intervention with measures that prevent or treat parenting stress in cases where mental health may be compromised, thus promoting mindful parenting practices. Specific results regarding the role of COVID-19 perceived impact on the association between positive mental health and parenting stress could also particularly aid professionals when planning interventions directed at new mothers during and after the pandemic and in other particularly stressful public health contexts.

Limitations and Future Research

The present study has some limitations. First, due to the cross-sectional design of the study, it is impossible to determine the direction of the proposed associations. To clarify the direction of the associations between the study variables and fully study their causal relationship and explanatory mechanisms, it would be necessary to adopt a longitudinal design. In the present study, we tried to address this issue by exploring alternative statistical models in which the variables were associated in different directions in order to look for further evidence regarding the direction of the proposed effects. However, with exception for the model testing the association between parenting stress and mindful parenting by evaluating the potential mediating role of positive mental health – that had a poorer performance when compared with the main model, as it was not significant – all the alternative mediation models showed significant and similar results regarding the indirect effects tested in each one of them, not aiding additional insights regarding this issue.

Second, also related to the cross-sectional design of the study, it is important to note that there is a potential for overlap or confounding in the mental health measures included in the study. As such, although positive mental health is a complete state of mental health that goes beyond the absence of anxious or depressive symptoms (Keyes, 2005; Monteiro et al., 2020a), and parenting stress has been massively studied in association with the results of other indicators of mental health in cross-sectional studies (Fernandes et al., 2021a; Moreira & Canavarro, 2018; Moreira et al., 2019; Pisula & Barańczuk, 2020), in the present study several procedures were done in order to prevent and screen for remaining overlap effects between the mental health measures used (i.e., depressive and anxious symptoms were controlled in all the statistical models of this study and an alternative mediation model was tested by removing the distress scale of the Parenting Stress Index – short form from its total score). The perceived impact of COVID-19 scale is a COVID-19-related events measure (i.e., having history of infection; being part of the population at risk; losing someone close due to infection; being isolated from her child) focused on perceived (and not objective) stress, which could also be biased by the respondent's mental health. However, the alternative event counts approach used to mitigate potential confounding effects of perceived COVID-19-related stress and mental health outcomes did not show relevant changes in our results.

Third, the sample was collected exclusively online. This may have caused a bias in the sample because the people most interested in the subject studied would be those who participated rather than the general public. This limitation could be managed in different ways. For example, by using carefully chosen incentives, a variety of recruitment channels, combining with other modes of data collection and using random sampling techniques could aid in managing this limitation. These measures could also address the fourth limitation: the small sample size. Although bootstrapping techniques have largely allowed the limitation of small sample size to be circumvented (Hayes, 2022), if the sample collected was larger, the analyses would have greater statistical power, allowing a greater number of covariates and increasing the reliability of the conclusions drawn.

Fifth, the present study did not include a measure of social desirability. Without assessing this bias, the study's findings may be susceptible to an overly positive representation of behaviors or attitudes. This effect is enhanced by a sixth limitation: the exclusive use of self-response instruments.

Seventh, the sample consisted only of new mothers, limiting the generalization of the conclusions to the population of fathers. Finally, the sample consisted of women who were mostly married or living with a partner, had completed higher education and lived in urban areas, making it difficult to generalize the results to mothers with other sociodemographic or family characteristics.

Despite these limitations, the present study met its objectives and generated additional knowledge about the associations between positive mental health, parenting stress and mindful parenting. This knowledge can guide the planning of interventions aimed at the early promotion of more adaptive parental attitudes and behaviors and promoters of healthy child development during early motherhood. Our findings can also aid in assessing the efficacy of already existing and future interventions aimed at new parents. Future investigations should focus on further exploring the relationships between the variables under study, namely the underlying mechanisms that may cause them. Further research on the variables studied, particularly in the context of other potentially stress-generating

situations such as economic crisis, armed conflict, and during critical life transitions, for example, would offer valuable insights. Our results allow us to be aware of the relationship between positive mental health and parenting stress in new mothers of infants and to create hypotheses to be explored in future investigations of this scope. The results also suggest the relevance of examining whether parenting stress decreases if we intervene by promoting positive mental health, particularly under stress-inducing circumstances.

Author Contributions Mariana Oliveira: Conceptualization, Methodology, Formal analysis, Investigation, Writing – Original draft preparation, Writing – Reviewing and Editing, Resources. Ana Luz Chorão: Formal analysis, Investigation, Writing – Reviewing and Editing, Resources. Maria Cristina Canavarro: Conceptualization, Methodology, Formal analysis, Investigation, Writing – Reviewing and Editing, Resources, Supervision. Raquel Pires: Conceptualization, Methodology, Formal analysis, Investigation, Writing – Original draft preparation, Writing – Reviewing and Editing, Resources, Supervision, Funding acquisition.

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Data Availability Deidentified data may be available from the corresponding author upon reasonable request.

Declarations

Ethics Statement The present study is part of a broader research project approved by the Ethics Committee of Faculty of Psychology and Educational Sciences of the University of Coimbra and conducted in compliance with the ethical standards for research with human beings (e.g., American Psychological Association, 2020; World Medical Association, 2013). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest We have no conflicts of interest to disclose.

Use of Artificial Intelligence AI was not used.

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