Enhancing parental well-being: initial efficacy of a 21-day online self-help mindfulness-based intervention for parents

Mindfulness (2022) 13:2812–2826
https://doi.org/10.1007/s12671-022-01998-1

ORIGINAL PAPER

Enhancing Parental Well-being: Initial Efficacy of a 21-Day Online Self-help Mindfulness-Based Intervention for Parents

Rebecca Y. M. Cheung[1,2] · Stanley K. C. Chan[3] · Harold Chui[4] · Wing Man Chan[3] · Sammy Y. S. Ngai[3]

Accepted: 20 September 2022 / Published online: 7 October 2022

Abstract

Objectives Parental self-care is extremely important in the face of stress throughout parenthood. A 21-day online mindfulness-based intervention was developed that was aimed at enhancing parental well-being. The present study evaluated this intervention by examining its initial efficacy on parents' mindfulness, parenting stress, subjective well-being, and symptoms of depression and anxiety.

Methods Participants were 273 parents (90.11% mothers) who were randomly assigned to the 21-day mindfulness-based intervention group ($n = 136$) or waitlist control group ($n = 137$). Pre-intervention assessment, immediate post-intervention assessment, and 30-day follow-up assessment were conducted to assess parents' mindfulness, parenting stress, subjective well-being, and symptoms of depression and anxiety.

Results Linear mixed models indicated that the group × time effects on subjective well-being, anxiety symptoms, and mindfulness were significant, after controlling for sex, age, education, income, habit of mindfulness practice, hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. Follow-up analyses indicated that compared to baseline, participants from the intervention group reported significantly greater subjective well-being and mindfulness, and fewer symptoms of anxiety than did those from the waitlist control group. The group × time effects on parenting stress and depressive symptoms were non-significant. Exploratory findings further suggested practicality and perceived acceptability of the intervention.

Conclusions This study showed initial efficacy of a 21-day online mindfulness-based intervention on parents' subjective well-being, anxiety symptoms, and mindfulness. The findings inform researchers and practitioners about the utility of a brief mindfulness-based intervention in promotion parental well-being. Other areas of feasibility warrant future investigation.

Keywords Anxiety symptoms · Initial efficacy · Mindfulness-based intervention · Parents · Subjective well-being

The study of mindfulness has flourished in the last few decades (Desrosiers et al., 2013; Garland et al., 2017a, b; Keng et al., 2011). Mindfulness is a mental state whereby people attend to the present-moment cognitive, emotional, and physical experiences without judgment (Kabat-Zinn, 1994). Mindfulness has been practiced for centuries in Buddhist and contemplative Christian communities to strengthen spirituality and religiosity (Kabat-Zinn, 2011; Trammel, 2015). Recent studies show that mindfulness is linked to better physical and psychological well-being, including fewer symptoms of depression and anxiety, lower perceived stress, reduced physical pain and impairment, better sleep, and better quality of life (Baer et al., 2012; Cheung & Ng, 2019; Finkelstein-Fox et al., 2019; Grossman et al., 2004). As a result, numerous secular mindfulness-based programs have emerged to enhance people's well-being, regardless of their religious orientation, cultural tradition, profession, age, and clinical status (e.g., Benn et al., 2012; Bögels et al., 2010; Fendel et al., 2020; Kabat-Zinn, 2009; Segal et al., 2018).

✉ Rebecca Y. M. Cheung
rebecca.cheung@reading.ac.uk

1 School of Psychology and Clinical Language Sciences, Harry Pitt Building, University of Reading, Earley Gate, Reading RG6 6ES, UK

2 Department of Early Childhood Education, The Education University of Hong Kong, Hong Kong, Hong Kong

3 New Life Psychiatric Rehabilitation Association, Hong Kong, Hong Kong

4 Department of Educational Psychology, The Chinese University of Hong Kong, Hong Kong, Hong Kong

Among existing mindfulness-based programs, the 8-week mindfulness-based stress reduction program (MBSR; Kabat-Zinn, 2009) is a group-intervention first developed in 1979 for chronically ill patients and has since shown mental health benefits across diverse populations, including adolescents and adults, in both clinical and non-clinical settings (e.g., Chi et al., 2018; Grossman et al., 2004). With reference to the MBSR and mindfulness-based cognitive therapy (MBCT; Segal et al., 2018), another 8-week program on mindful parenting (Bögels & Restifo, 2013; Bögels et al., 2010) and its modified versions (e.g., Boekhorst et al., 2021) have also received much attention, demonstrating benefits beyond parenting practices, including better parents' and children's mental health and adjustment, better coparenting practices, better self-compassion among parents, and reduced parenting stress (Boekhorst et al., 2021; Bögels et al., 2014; Emerson et al., 2021; Ma & Siu, 2016; van der Oord et al., 2012). Although mindfulness-based interventions have been developed to enhance parents' well-being, especially for parents with a child with special needs (e.g., Bazzano et al., 2015; Benn et al., 2012; Lunsky et al., 2021), most of the programs are either family-focused (e.g., Coatsworth et al., 2015) or parenting-focused (Bögels & Restifo, 2013; Ferraioli & Harris, 2013; Petcharat & Liehr, 2021; Shaffer et al., 2020), with few focusing primarily on parental well-being. Indeed, one of the core aspects of mindful parenting programs is to foster parental well-being (e.g., Bögels et al., 2010), as parents who are well are also more likely to respond skillfully to the child (e.g., Cheung et al., 2019; Jones et al., 2014; Miner, 2019). Nevertheless, well-being programs are also important, as they offer practical strategies for parents to tackle with well-being challenges during parenthood (Camisasca et al., 2016; Johansson et al., 2020).

According to mindfulness-to-meaning theory (Garland et al., 2015), mindfulness is associated with well-being via mindful emotion regulation. Mindfulness facilitates decentering from negative stress appraisal to metacognitive awareness. For instance, parents who are mindful may disengage themselves from autopilot responses to stress (e.g., reacting negatively to a spouse/a child upon the arising of competing demands from an employer). Instead, they may pause, decenter from immediate reactions, and broaden their awareness to previously unattended details (e.g., availability of alternative solutions to reduce work-family conflict). The shift of attention and awareness further increases people's ability to regulate emotions and reappraise negative experiences to a positive light (Teper et al., 2013). Recent findings based on mindfulness-to-meaning theory show that mindfulness fosters adaptive emotion regulation, such as positive reappraisal and savoring, thereby increasing positive emotions and mental well-being (e.g., Bryant & Smith, 2015; Cheung & Lau, 2021; Cheung & Ng, 2020; Garland et al., 2017a, b, 2021; McConnell & Froeliger, 2015). Similar findings are also indicated among parents, in that mindfulness or mindful parenting behavior is linked to lower parenting stress and better mental health (e.g., Burgdorf et al., 2019; Cheung et al., 2019; Moreira & Canavarro, 2018).

Consistent with mindfulness-to-meaning theory (Garland et al., 2015), parents who took part in mindfulness-based programs experienced better mental health and lower perceived stress (e.g., Bazzano et al., 2015; Benn et al., 2012). For instance, parents of children with developmental disabilities who completed an 8-week MBSR program experienced greater mindfulness, psychological well-being, and self-compassion, as well as lower general and parental stress (Bazzano et al., 2015). Similarly, upon completion of a 5-week mindfulness training, parents and educators of children with special needs experienced greater mindfulness, self-compassion, and personal growth than did people from the waitlist control group (Benn et al., 2012). Furthermore, parents of children with autism who took part in a 6-week group virtual MBCT reported greater mindfulness, lower stress, and fewer depressive symptoms (Lunsky et al., 2021). Although the above studies involved caregivers of children with disabilities or special needs, recent findings indicated that the positive effects of mindful parenting training did not differ between families from clinical and non-clinical settings (Potharst et al., 2021). Hence, mindfulness training is beneficial to parents of children with and without special needs.

Given the mental health benefits of mindfulness, online mindfulness-based and mindfulness-related interventions for parents have burgeoned recently (e.g., Boekhorst et al., 2021; Flynn et al., 2020; Potharst et al., 2019; Shaffer et al., 2020; see Sommers-Spijkerman et al., 2021, for a meta-analytic review of the effects of online mindfulness-based interventions on mental health). The online format offers parents the appeals of flexibility (e.g., reduced costs and efforts of transportation, options to go over recordings after class and to attend to family matters during break time), especially in times of the COVID-19 pandemic (Lunsky et al., 2021). While some of these interventions are conducted in real-time settings (Lunsky et al., 2021), others are asynchronous (Aller et al., 2020; Boekhorst et al., 2021), including the intervention developed in this study. As parents often face caregiving and other responsibilities such as household chores, work-family balance, and financial demands (Hook et al., 2022; Ponnet et al., 2016; Ruppanner et al., 2021), short-term asynchronous interventions allow flexibility for parents to participate at their convenience and reduce the burdens of scheduling. Once an asynchronous program has been developed, the cost of administration is also much lower than synchronous, real-time interventions, most of which require the presence of a qualified or certified mindfulness teacher. Hence, online asynchronous mindfulness-based interventions are preferred by adults (Wahbeh et al., 2014)

and show preliminary evidence in improving attention and reducing stress and anxiety among nursing students (Spadaro & Hunker, 2016). With peer support, online asynchronous mindfulness-based training for parents and family carers of people with intellectual disabilities has also demonstrated acceptability and feasibility (Flynn et al., 2020). Despite the advantages, the disadvantages of asynchronous MBIs should also be noted, including the removal of a group context and a heavy reliance on self-learning, in addition to the absence of teacher-guided inquiries, peer interactions, and a responsive teacher (Cavanagh et al., 2014).

While numerous mindfulness-based programs for parents' well-being have been evaluated in the Western context (Bazzano et al., 2015; Benn et al., 2012; Lunsky et al., 2021), few have been developed and examined in Asian contexts, such as Hong Kong. As a densely populated city involving fast-paced living and a soaring housing market (Lam, 2021), parents not only face parental stress as caregivers, but also other types of demands, such as household crowdedness and economic stress. Regarding work-family balance, a recent government report shows that local men and women had a median of 44.4 and 42.6 weekly working hours, respectively (Census and Statistics Department, Hong Kong Special Administrative Region, 2021b), totaling 2088 annual working hours. This figure was greater than the worldwide average annual working hours (Organisation for Economic Co-operation and Development, n.d.) and indicated potential job stress and burnout (e.g., Ng et al., 2020; Tsang, 2018). In addition, compared to (non-Asian) American parents, Chinese parents tend to provide much more direct (e.g., offering homework help) and indirect (e.g., giving children fewer household chores) assistance to support children's learning (Ng & Wei, 2020). These practices increase parental involvement and potential burden among the parents. As such, the stress and demands encountered by parents in Hong Kong may undermine their overall mental health (Lam, 2015; Wong et al., 2003).

Based on Bowen et al.'s (2009) conceptualization of feasibility studies, this study aimed to evaluate a core aspect of feasibility, i.e., initial efficacy, of a self-help online asynchronous mindfulness intervention for parents entitled "New Life Mindfulness-based Program for Parents" (NL-MBP). The study also explored the practicality and the perceived acceptability of NL-MBP, as reflected by participants' frequency of mindfulness practice over a 21-day period, their knowledge and attitudes about mindfulness and self-care, their perceived usefulness of NL-MBP, and whether they would recommend NL-MBP at post-intervention. It was hypothesized that compared to parents in the waitlist control group, those enrolled in the 21-day mindfulness-based intervention would have greater mindfulness, lower parental stress, and better mental health, as indexed by greater subjective well-being and fewer symptoms of depression and anxiety at the post-intervention assessment, after controlling the effects of sex, age, education, income, habit of mindfulness practice, hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. Similarly, it was hypothesized that the benefits of the intervention would be sustained at the 30-day follow-up.

Method

Participants

A total of 441 Chinese parents were recruited from various sources, including parent-teacher associations in local primary schools, social media, and one-off mindfulness workshops organized for parents in primary schools, who went through a screening process. The inclusion criteria were as follows: (a) being proficient in Chinese, (b) having a child at a local primary school, (c) not being at risk for self-harm, and (d) did not have a relapse of psychiatric disorder in the past 6 months. Among them, 58 parents did not meet the inclusion criteria. Therefore, 383 eligible parents were randomized to the intervention group ($n = 187$) or waitlist control group ($n = 196$). Figure 1 shows the CONSORT flow diagram of recruitment and retention. Among the 383 participants, 110 were excluded because they either did not complete the pre-intervention assessment ($n = 108$) or were participating in other mindfulness-based interventions at that moment ($n = 2$). The final sample included 136 parents for the intervention group and 137 parents for the waitlist control group. Table 1 presents the demographic information of the participants. Chi-square tests and independent samples t-tests indicated that participants from the intervention group and the waitlist control group did not differ in the demographic variables and the core study variables ($ps > 0.05$), except for depressive symptoms ($t(271), -2.33$, $p = 0.02$, Cohen's $d = 0.08$), with those from the intervention group reporting a lower level of depressive symptoms ($M = 7.51$, $SD = 4.55$) than those from the control group ($M = 8.92$, $SD = 5.43$).

The attrition rate of the present study was comparable to other studies involving self-help interventions (e.g., 27%; Cavanagh et al., 2014) or internet-based treatments (e.g., 31%; Melville et al., 2010). Specifically, within the intervention group ($n = 136$), the attrition rate was 31.62% ($n = 43$) at post-intervention and 16.13% ($n = 15$) at 30-day follow-up. No significant differences were found between dropouts and post-intervention completers for all variables under study ($ps > 0.05$). However, at follow-up, the dropouts and the retained participants differed in age ($t(134) = -2.12$, $p = 0.36$) and mindfulness ($t(94) = -2.95$, $p = 0.004$). Participants who completed the follow-up were significantly older ($M = 42.27$, $SD = 6.27$) and more mindful ($M = 65.34$, $SD = 7.16$) than were the dropouts (age

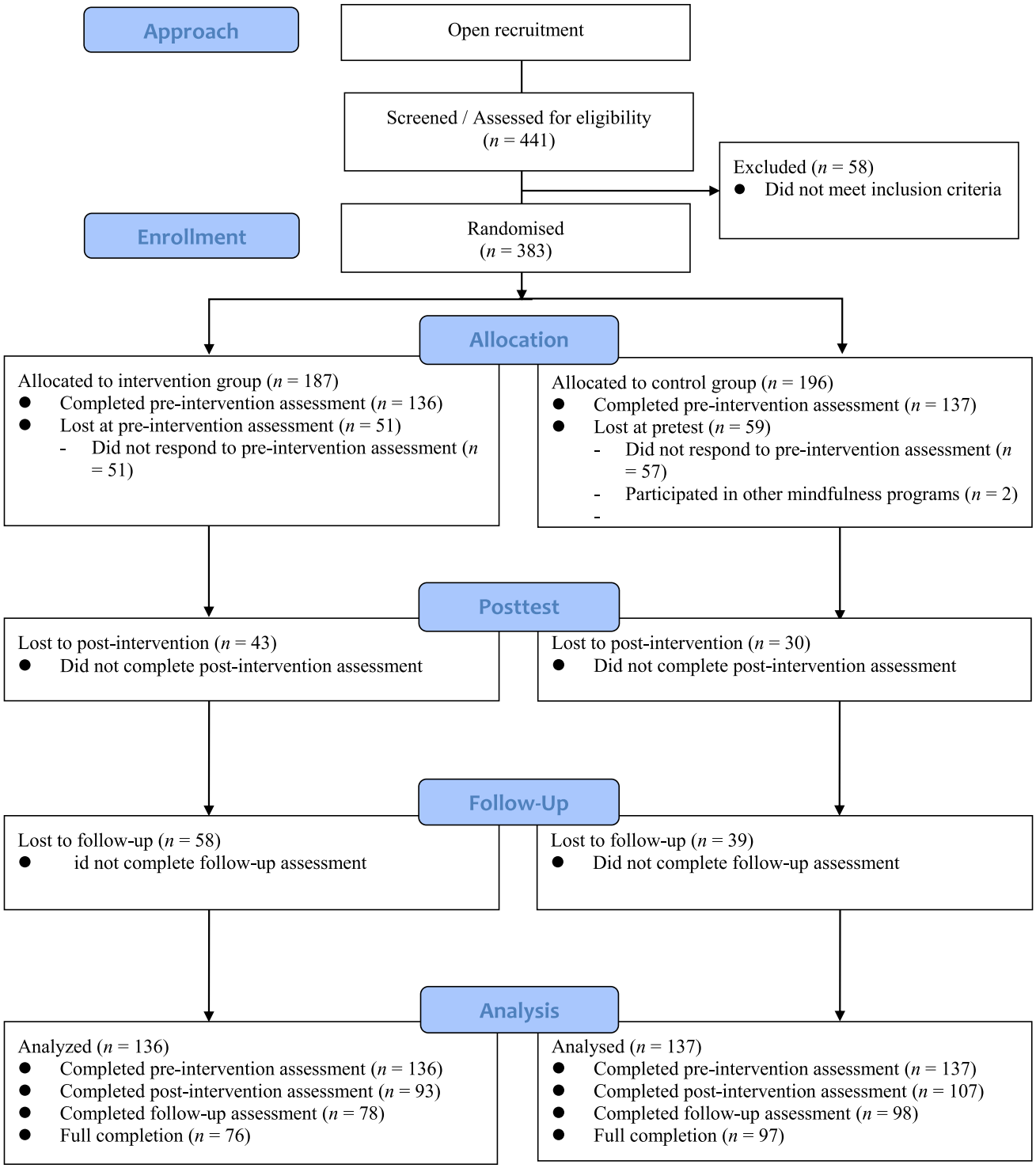

Fig. 1 CONSORT flowchart for participants: recruitment and retention

$M = 40.16$, $SD = 4.98$; mindfulness $M = 59.70$, $SD = 9.20$). Within the waitlist control group ($n = 137$), the attrition was 21.90% ($n = 30$) at post-intervention and 8.41% ($n = 9$) at the 30-day follow-up. No significant differences were found between completers and dropouts at either time point for all variables ($ps > 0.05$). Little's missing completely at random test was conducted to test the null hypothesis of data missing completely at random. The finding was non-significant ($\chi^2(198) = 173.47$, $p = 0.90$), suggesting the data were missing completely at random.

Table 1 Demographic information of participants

	Intervention group ($n = 136$) percentage/mean (SD)	Waitlist control group ($n = 137$) percentage/mean (SD)	Group difference p values (two-tailed)
Gender			.15
Male	12.50%	7.30%	
Female	87.50%	92.70%	
Age (in years)	41.37 (5.83)	41.58 (4.89)	.51
Monthly family income (in Hong Kong Dollar)			.08
< $10,000	8.09%	4.38%	
$10,001–$30,000	23.53%	19.71%	
$30,001–$50,000	29.41%	25.55%	
$50,001–$70,000	20.58%	10.95%	
$70,001–$90,000	5.88%	12.41%	
> $90,001	10.29%	16.79%	
Unknown/Not available	4.41%	7.30%	
Educational level			.60
Primary education or below	0.74%	0.73%	
Form 1–3 of secondary education	2.94%	2.19%	
Form 4–7 of secondary education	18.38%	13.14%	
Associate/Diploma/Undergraduate education	51.47%	57.66%	
Graduate degree or above	26.47%	25.55%	
Unknown/Not available	0.00%	0.73%	
Marital status			.54
Single	0.74%	0.73%	
Married	92.65%	94.16%	
Divorced	5.15%	4.38%	
Living separately	0.00%	0.73%	
Widowed	1.47%	0.00%	
Knowledge about mindfulness			.09
Unfamiliar	41.18%	34.31%	
A bit	54.41%	64.23%	
Quite familiar	4.41%	0.73%	
Very familiar	0.00%	0.73%	
Habit of practicing mindfulness			.88
Yes	13.24%	13.87%	
No	86.76%	86.13%	
Mindfulness activities with children			.89
Yes	16.18%	16.79%	
No	83.82%	83.21%	

Procedures

Following the group allocation, participants completed the pre-intervention online questionnaires via REDCap electronic data capture tools (Harris et al., 2009, 2019). Although the online self-help intervention was not originally designed in response to the COVID-19 pandemic, it was conducted between May 2020 and January 2021 during the fluctuating pandemic. For the intervention group, participants received the 21-day mindfulness-based program instructions upon their completion of the pre-intervention assessment at baseline. Specifically, a set of guided mindfulness practice recording and its corresponding reading was sent to participants daily via WhatsApp, a mobile instant messaging application commonly used in Hong Kong. Participants completed the practice on their mobile phones asynchronously at their convenience, regardless of the location. After 21 days, participants received the post-intervention questionnaire via REDCap. A WhatsApp reminder was sent to participants if they had not responded to the

questionnaire within 3 days. Upon completion of the post-intervention assessment, a follow-up assessment was delivered to the participants via REDCap after 30 days. Participants received a supermarket coupon at HK$40 (~US$5) for their time and effort upon completion of the pre-intervention and post-intervention assessments. To minimize attrition, participants who completed the pre-intervention, post-intervention, and follow-up assessments received an additional supermarket coupon at HK$60 (~US$7.5).

As for the waitlist control group, similar procedures were conducted at baseline, post-intervention, and follow-up. Participants in the waitlist control group also received the same incentives described above. Upon completion of the follow-up assessment, they received the 21-day guided mindfulness practice recordings and the corresponding readings.

The 21-Day Self-help Mindfulness-Based Intervention

The self-help online mindfulness-based intervention for parents, entitled "New Life Mindfulness-based Program for Parents" (NL-MBP), is an asynchronous intervention based on MBSR (Kabat-Zinn, 2009) and MBCT (Williams & Penman, 2011). The intervention was designed by a registered educational psychologist, who was also an experienced mindfulness teacher in Hong Kong. The 21-day intervention aimed to increase mindfulness through eight-core mindfulness practices, namely mindful eating, body scan, mindful breathing, mindful stretching, mindful walking, self-care exercise, breathing space, and lovingkindness practice. To promote their understanding and application of mindfulness, parents were invited to engage in a daily 10- to 15-min guided mindfulness practice and a corresponding one-page reading for 21 consecutive days (see Table 2). Previous research indicated that 21 days of mindful breathing practices could lead to an overall change in habit automaticity (Lewis et al., 2021; see also Maltz, 1969) and health outcomes (Li et al., 2022). Based on the evidence, 21 practices and corresponding readings were developed for the intervention. In the present study, each set of the recording and reading was presented to the participants simultaneously every day. Participants were encouraged daily to complete the practices at their convenience. The content of NL-MBP included (a) general information on mindfulness, such as its misconceptions and potential benefits, (b) description of the mindfulness practices, (c) skillful responses to encounter common difficulties, especially in the family setting, (d) seven attitudes in cultivating mindfulness (i.e., non-judging, patience, beginner's mind, trust, non-striving, acceptance, and letting go; Kabat-Zinn, 2012), and (e) application of mindfulness in daily lives. Although the 21-day intervention offered parents mindfulness exercises for self, family scenarios were included to enhance their interest and motivation to practice as a parent or a family member. For example, one of the mindful breathing recordings included the following excerpt, "have you ever noticed your breathing? When you are chasing the school bus with your child, your breathing

Table 2 Themes of the 21-day self-help mindfulness-based intervention

Day	Recording	Reading
1	Mindful eating	Introduction to mindfulness
2	Body scan (1)	How to practice a body scan?
3	Body scan (2)	Possible situations during body scanning
4	Body scan (3)	Benefits of mindfulness
5	Body scan (4)	Emphasizing on non-judging and patience
6	Mindful breathing (1)	Introduction to mindful breathing
7	Mindful breathing (2)	Welcoming distractions in mindfulness practice
8	Mindful breathing (3)	Misconceptions of mindfulness (1)
9	Mindful breathing (4)	Emphasizing on beginner's mind and trust
10	Mindful stretching (1)	Introduction to mindful stretching
11	Mindful stretching (2)	Exploring and sensing your limits
12	Mindful stretching (3)	Knowing your dark side and living in the moment
13	Mindful stretching (4)	Emphasizing on non-striving and acceptance
14	Mindful walking (1)	Introduction to mindful walking
15	Mindful walking (2)	Misconceptions of mindfulness (2)
16	Self-compassion exercise (1)	Introduction to self-compassion
17	Self-compassion exercise (2)	Self-compassion for parents
18	Self-compassion exercise (3)	Emphasizing on letting go
19	"Take a step back, give yourself a breather" (1)	Listening attentively to your own feelings
20	"Take a step back, give yourself a breather" (2)	Importance of taking a step back
21	Mindful breathing and self-reflection	Conclusion

is faster than usual. When you are drawing a picture with your child, your breathing is more stable and slower. Let's practice the awareness of our breath together…" It should be noted that the NL-MBP was not a family-focused intervention for family members to practice mindfulness together. With aims to promote parental well-being, the NL-MBP also was not a mindful parenting intervention.

Measures

Subjective Well-being

The five-item World Health Organization Well-being Index (WHO-5; World Health Organization, 1998) was used to measure parents' subjective well-being. All items were rated on a 6-point scale ranging from 0 (*never*) to 5 (*all the time*). Sample items included "I have felt cheerful and in good spirits" and "I have felt active and vigorous." An overall score was calculated by summing the item scores, with higher scores indicating a better quality of life. Previous studies reported good internal consistency, convergent validity, and sensitivity to change of the scale (e.g., Newnham et al., 2010). In this study, Cronbach's alpha = 0.91 and McDonald's $\omega = 0.91$.

Anxiety Symptoms

The seven-item Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) was used to measure anxiety symptoms on a 4-point scale, ranging from 0 (*not at all*) to 3 (*nearly every day*). The item scores were summed to form a total score, with higher scores indicating greater anxiety. Sample items included "Feeling nervous, anxious or on edge" and "Not being able to stop or control worrying." The Chinese version of GAD-7 was previously validated in Chinese individuals (e.g., He et al., 2010). In this study, Cronbach's alpha = 0.92 and McDonald's $\omega = 0.92$.

Depressive Symptoms

The 9-item Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) was used to assess symptoms of depression. Participants described how often they experienced any depressive symptoms in the past 2 weeks. Items were rated on a 4-point scale from 0 (*not at all*) to 3 (*almost every day*). A sample item is as follows, "In the past two weeks, I had less interest and fun in doing activities." A total score was calculated by summing the item scores, with higher scores indicating greater severity of depression. The Chinese version of PHQ-9 was validated in the Chinese context and indicated good validity and internal consistency (e.g., Yu et al., 2012). In this study, Cronbach's alpha = 0.87 and McDonald's $\omega = 0.87$.

Mindfulness

The 20-item Five Facet Mindfulness Questionnaire – Short Form (FFMQ-SF; Hou et al., 2014) was used to assess mindfulness on five facets, namely observing, describing, acting with awareness, non-reactivity, and non-judging (Baer et al., 2008). Participants rated on a 5-point scale, ranging from 1 (*never*) to 5 (*always*). Sample items included "I pay attention to sensations, such as the wind in my hair or sun on my face" and "I'm good at finding words to describe my feelings." A total score was computed by summing the item scores, with higher scores indicating greater mindfulness. In this study, Cronbach's alpha = 0.80 and McDonald's $\omega = 0.73$.

Parental Stress

The 17-item Parental Stress Scale (PSS; Berry & Jones, 1995) was used to measure parents' subjective feelings of difficulties, dissatisfaction, and strains. All items were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items included "I am happy in my role as a parent" and "Caring for my children sometimes takes more time and energy than I have to give." A total score was obtained by summing the item scores, with higher scores indicating greater stress. The Chinese version of the PSS was previously validated and showed high internal consistency (Cheung, 2000). In this study, Cronbach's alpha = 0.70 and McDonald's $\omega = 0.89$.

Data Analyses

Tests of descriptive statistics were conducted to explore participants' frequency of practice and perceived acceptability. Linear mixed models (LMMs) were conducted via the lme4 package (Bates et al., 2014) in R version 4.1.1 (R Core Team, 2021) to examine between-group differences (intervention vs. waitlist control group) over time (pre-intervention, post-intervention, and follow-up), after controlling the effects of sex, age, education, income, habit and hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder, with maximum likelihood as the estimation method. Given our attrition of 31.62% and 16.13% at post-intervention and follow-up, respectively, LMM was conducted via the missing at random assumption. By estimating random subject effects, participants with missing data were included, with observed values being used to detect the pre-post changes between groups. The p values for fixed effects coefficients were acquired using Satterthwaite's method of approximations of degrees of freedom. Upon detection of significant group × time effects, follow-up

within- and between-group analyses were conducted using *t*-tests.

Results

Frequency of Practice

A total of 43 participants from the intervention group recorded their frequency of practice that indicated their degree of program completion. Specifically, 25.58% and 48.84% reported they had completed the guided meditations and readings every day, respectively, whereas 46.51% and 16.28% completed 15 to 20 days of guided meditations and readings, respectively. In addition, 9.30% and 16.28% reported they had completed 9 to 14 days of guided meditations and readings, respectively, whereas 13.95% and 11.63% completed 3 to 8 days of guided meditations and readings, respectively. Finally, 4.65% and 6.98% of the participants reported that they had completed fewer than 3 days of guided meditations and readings, respectively. Participants who recorded their frequency of practice did not differ from the others in the intervention group on all study variables, including mindfulness, subjective well-being, symptoms of depression and anxiety, sex, age, education, income, habit of mindfulness practice, hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder ($ps > 0.05$). However, participants who recorded their frequency of practice reported higher parental stress ($M = 55.79$, $SD = 9.48$) than those who did not ($M = 49.90$, $SD = 12.13$) ($t(93) = -2.59$, $p = 0.011$). Follow-up analyses indicated that a greater frequency of mediation practice was associated with better subjective well-being at baseline ($r = 0.31$, $p = 0.043$) and post-intervention ($r = 0.50$, $p = 0.001$). A greater frequency of mediation practice was also associated with fewer depressive symptoms ($r = -0.32$, $p = 0.39$) and greater mindfulness at post-intervention ($r = 0.46$, $p = 0.002$), but not with the other variables or time points ($ps > 0.05$). Similarly, greater completion of readings was associated with greater subjective well-being ($r = 0.41$, $p = 0.006$), fewer depressive symptoms ($r = -0.33$, $p = 0.03$), and greater mindfulness at post-intervention ($r = 0.47$, $p = 0.002$). It was also associated with greater mindfulness at baseline ($r = 0.40$, $p = 0.008$) and follow-up ($r = 0.47$, $p = 0.01$), but not with the other variables or time points ($ps > 0.05$).

Perceived Acceptability

A total of 44 participants from the intervention group rated their perceived acceptability of the intervention (Bowen et al., 2009). Notably, all participants agreed the intervention was useful, 97.73% reported that the intervention increased their knowledge about mindfulness, 95.45% reported that the intervention helped them realize the importance of self-care, 86.36% noted that they would recommend the intervention to others, and 81.82% expressed they would continue practicing mindfulness.

Group × Time Effects

At baseline, participants did not differ between groups on subjective well-being ($M_{\text{intervention}} = 8.93$, $SD = 4.21$; $M_{\text{control}} = 8.58$, $SD = 4.56$), anxiety ($M_{\text{intervention}} = 7.81$, $SD = 4.60$; $M_{\text{control}} = 8.82$, $SD = 5.45$), depressive symptoms ($M_{\text{intervention}} = 7.51$, $SD = 4.55$; $M_{\text{control}} = 8.92$, $SD = 5.43$), mindfulness ($M_{\text{intervention}} = 59.87$, $SD = 7.84$; $M_{\text{control}} = 59.28$, $SD = 7.94$), and parental stress ($M_{\text{intervention}} = 55.76$, $SD = 11.54$; $M_{\text{control}} = 57.39$, $SD = 12.48$) ($ps > 0.05$). Similarly, participants in full completion of the study did not differ between groups in subjective well-being ($M_{\text{intervention}} = 9.27$, $SD = 4.24$; $M_{\text{control}} = 8.67$, $SD = 4.87$), anxiety ($M_{\text{intervention}} = 7.29$, $SD = 4.51$; $M_{\text{control}} = 8.29$, $SD = 5.13$), depressive symptoms ($M_{\text{intervention}} = 7.06$, $SD = 4.58$; $M_{\text{control}} = 8.37$, $SD = 5.28$), mindfulness ($M_{\text{intervention}} = 60.23$, $SD = 7.28$; $M_{\text{control}} = 60.19$, $SD = 7.65$), and parental stress ($M_{\text{intervention}} = 55.62$, $SD = 11.59$; $M_{\text{control}} = 57.37$, $SD = 12.80$) ($ps > 0.05$).

LMM revealed significant group × time effect on subjective well-being ($F(1, 436.18) = 16.75$, $p < 0.001$, CI: $-1.72, -0.60$, $\eta_p^2 = 0.04$), after controlling for of age, sex, education, income, habit and hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. Follow-up analyses suggested that compared to baseline ($M_{\text{intervention}} = 8.93$, $SD = 4.21$; $M_{\text{control}} = 8.58$, $SD = 4.56$), participants from the intervention group reported significantly greater subjective well-being than did those from the control group at post-intervention ($t(207) = 4.78$, $p < 0.001$, Cohen's $d = 0.66$; $M_{\text{intervention}} = 13.18$, $SD = 4.62$; $M_{\text{control}} = 10.09$, $SD = 4.71$) and at follow-up ($t(178) = 3.30$, $p = 0.001$, Cohen's $d = 0.50$; $M_{\text{intervention}} = 13.56$, $SD = 4.68$; $M_{\text{control}} = 11.24$, $SD = 4.67$). Within-group analyses indicated that compared to baseline, participants from the intervention group had a significant increase of subjective well-being at post-intervention ($t(97) = -9.78$, $p < 0.001$, Cohen's $d = -0.99$) and at follow-up ($t(78) = -8.79$, $p < 0.001$, Cohen's $d = -0.99$). Participants from the control group also had a significant and smaller increase of subjective well-being at post-intervention ($t(110) = -4.39$, $p < 0.001$, Cohen's $d = -0.42$) and at follow-up ($t(100) = -6.70$, $p < 0.001$, Cohen's $d = -0.67$). See Fig. 2 for details.

LMM also revealed significant group × time effect on anxiety ($F(1, 421.47) = 4.35$, $p = 0.04$, CI: 0.04, 1.38, $\eta_p^2 = 0.01$), after controlling for age, sex, education, income, habit and hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. Follow-up analyses suggested that compared to baseline ($M_{\text{intervention}} = 7.81$,

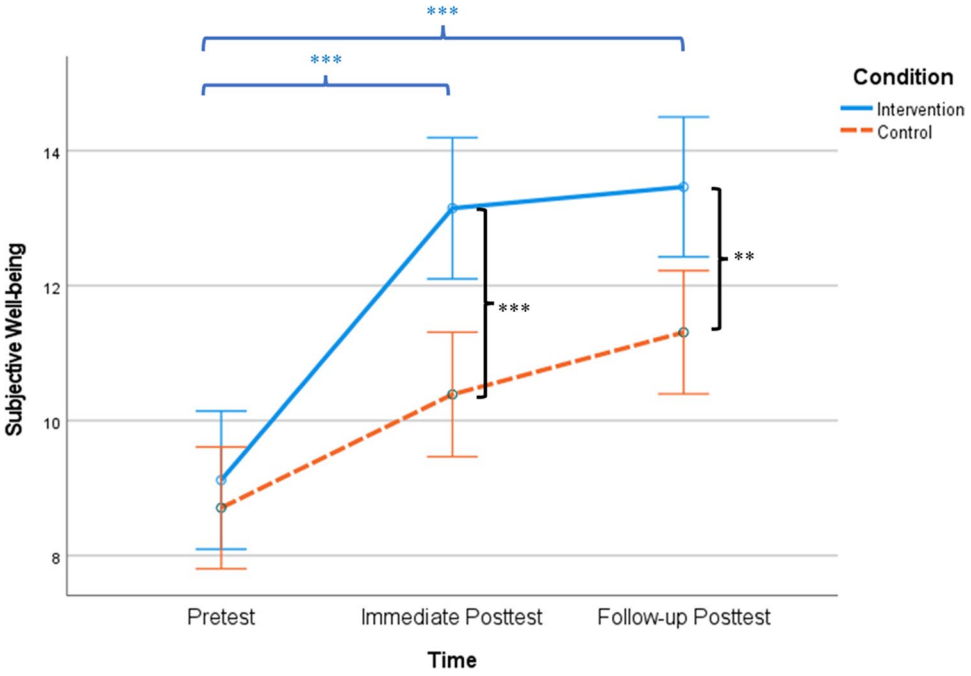

Fig. 2 Subjective well-being between conditions over time. *Note.* $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Asterisks between the solid and dashed lines denote between-group differences at each time point. Asterisks on the top denote significant differences between baseline, post-intervention, and follow-up within the intervention group

$SD = 4.60$; $M_{control} = 8.82$, $SD = 5.45$), participants from the intervention group reported significantly lower anxiety levels than did those from the control group at post-intervention ($t(201) = -4.06$, $p < 0.001$, Cohen's $d = -0.57$; $M_{intervention} = 5.50$, $SD = 4.73$; $M_{control} = 8.50$, $SD = 5.70$) and at follow-up ($t(171) = -2.56$, $p = 0.01$, Cohen's $d = -0.39$; $M_{intervention} = 5.12$, $SD = 4.79$; $M_{control} = 7.25$, $SD = 5.92$). Within-group analyses indicated that compared to baseline, participants from the intervention group had a significant reduction of anxiety symptoms at post-intervention ($t(95) = 4.15$, $p < 0.001$, Cohen's $d = 0.42$) and at follow-up ($t(76)$, 3.96, $p < 0.001$, Cohen's $d = 0.45$). In comparison, participants from the control group did not have significant reductions of anxiety at post-intervention and follow-up ($ps > 0.05$). See Fig. 3 for details.

Next, LMM revealed significant group × time effect on mindfulness ($F(1, 409.26) = 12.53$, $p < 0.001$, CI: −2.45, −0.70, $\eta_p^2 = 0.03$), after controlling for age, sex, education, income, habit and hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. Follow-up analyses suggested that compared to the baseline ($M_{intervention} = 59.87$, $SD = 7.84$;

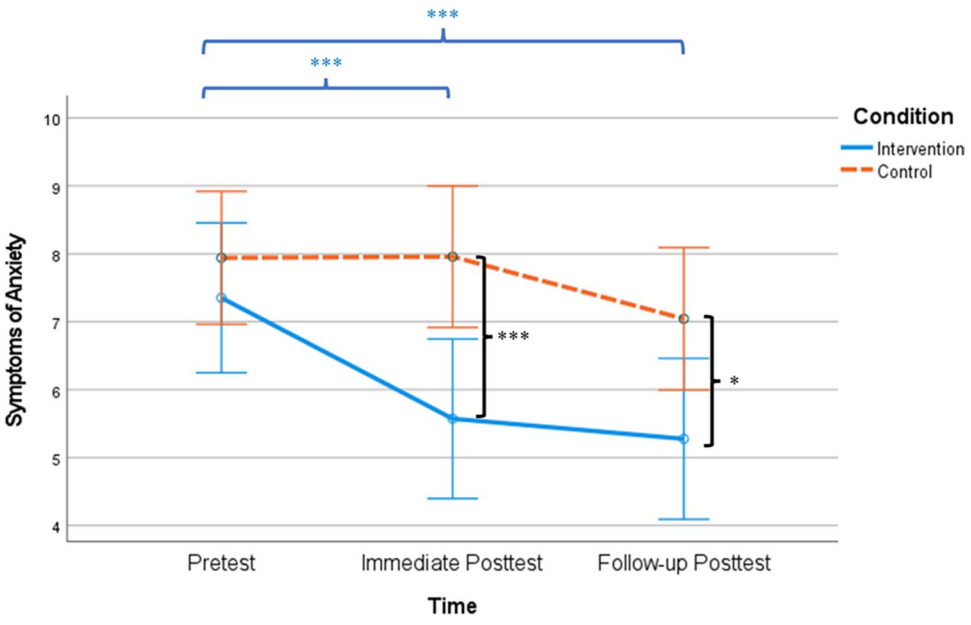

Fig. 3 Symptoms of anxiety between conditions over time. *Note.* $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Asterisks between the solid and dashed lines denote between-group differences at each time point. Asterisks on the top denote significant differences between baseline, post-intervention, and follow-up within the intervention group

$M_{control} = 59.28$, $SD = 7.94$), participants from the intervention group reported significantly greater mindfulness than did those from the control group at post-intervention ($t(202) = 3.97$, $p < 0.001$, Cohen's $d = 0.56$; $M_{intervention} = 64.17$, $SD = 7.92$; $M_{control} = 59.81$, $SD = 7.77$) and at follow-up ($t(169) = 2.67$, $p = 0.008$, Cohen's $d = 0.41$; $M_{intervention} = 64.73$, $SD = 7.83$; $M_{control} = 61.33$, $SD = 8.55$). Within-group analyses indicated that compared to the baseline, participants from the intervention group had a significant increase of mindfulness at post-intervention ($t(95) = -7.26$, $p < 0.001$, Cohen's $d = -0.74$) and at follow-up ($t(72) = -6.20$, $p < 0.001$, Cohen's $d = -0.73$). Participants from the control group did not have a significant increase in mindfulness at post-intervention ($p > 0.05$), but they had a significant increase at follow-up ($t(97) = -2.30$, $p < 0.001$, Cohen's $d = -0.25$), compared to baseline. See Fig. 4 for details.

LMM revealed non-significant group × time effects on parents' depressive symptoms ($F(1, 421.75) = 1.07$, $p = 0.30$, CI: −0.31, 1.00, $\eta_p^2 = 0.002$) and parental stress ($F(1, 396.37) = 2.86$, $p = 0.09$, CI: −0.16, 2.16, $\eta_p^2 = 0.007$), after controlling for the effects of sex, age, education, income, habit of mindfulness practice, hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. As such, the intervention group did not differ from the waitlist control group in changing participants' depressive symptoms and parental stress.

Discussion

Drawing from previous research (e.g., Williams & Penman, 2011), a 21-day mindfulness-based intervention entitled NL-MBP was developed for parents in Hong Kong and its initial efficacy was evaluated. Through a non-clinical parent sample, the brief asynchronous intervention showed changes in some areas (i.e., mindfulness, subjective well-being, and anxiety) and not others (i.e., parenting stress and depressive symptoms), after controlling the effects of sex, age, education, income, habit and hours of weekly mindfulness practice, and diagnostic history of psychiatric disorder. Initial data also suggested that the NL-MBP was acceptable and practical.

Consistent with previous studies showing the mental health benefits of mindfulness-based interventions (Bazzano et al., 2015; Benn et al., 2012; Lunsky et al., 2021), the present study indicated that the NL-MBP improved parents' mindfulness and subjective well-being and reduced their anxiety symptoms. As discussed earlier, parenthood can be stressful, especially in a fast-paced city such as Hong Kong, whereby parents typically work long hours to afford the living expenses (Aryee et al., 1999a; Jung & Kim, 2021). Together with work and economic stress, childcare responsibilities and potential work-family conflict may further undermine parents' well-being (Aryee et al., 1999b; Brooks-Gunn et al., 2010; Chatterji et al., 2013; Jung & Kim, 2021). Mindfulness provides an avenue to help parents respond to their everyday responsibilities. By pausing and disengaging themselves from autopilot, parents are more likely to

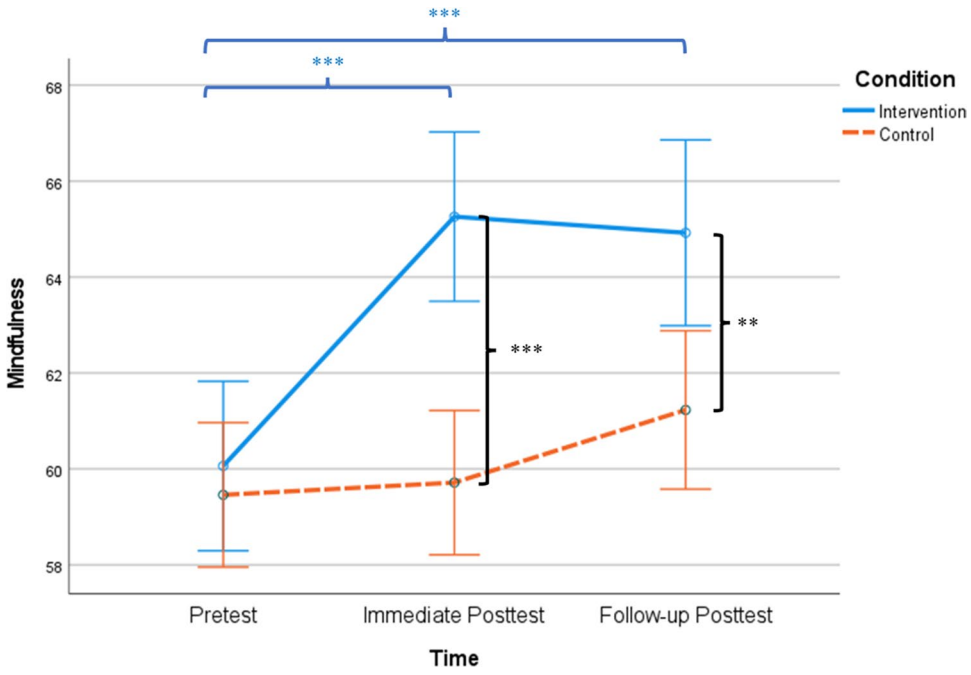

Fig. 4 Mindfulness between conditions over time. *Note.* $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Asterisks between the solid and dashed lines denote between-group differences at each time point. Asterisks on the top denote significant differences between baseline, post-intervention, and follow-up within the intervention group

broaden their awareness to previously unattended details, such that they could develop better subjective well-being (Garland et al., 2015). They are also less likely to chronically engage in fight or flight response, which is linked to anxiety problems (Kunimatsu & Marsee, 2012; Wheatley, 1997). For example, in the midst of a conflict, parents are more likely to pause and be aware of their physical sensations (e.g., sweaty palms), emotions (e.g., anger), and potential assumptions and biases (e.g., "my son fails the exam because he is not working hard enough"). They are also more likely to listen to themselves and other family members with full attention and respond skillfully. By pausing, attending, and skillfully responding to themselves and to others, parents are more likely to have a greater well-being.

The NL-MBP did not reduce parents' depressive symptoms at post-intervention and the delayed follow-up. Compared to other 8-week interventions such as MBCT (Kabat-Zinn, 2009) or MBSR (Segal et al., 2018), the brevity of the present intervention, its asynchronous nature, and the lack of contact with a responsive teacher and peers might have contributed to the null findings. In addition, the baseline level of depressive symptoms was low in the present sample ($M_{\text{intervention}} = 7.51$, $SD_{\text{intervention}} = 4.55$; $M_{\text{control}} = 8.92$, $SD_{\text{control}} = 5.43$; range: 0–27), so there might have been little room for improvement. Similarly, the intervention did not reduce parental stress and contradicted previous findings (e.g., Burgdorf et al., 2019). In the present study, the mindfulness readings and practice recordings were targeted to improve parents' well-being, rather than to reduce parental stress or enhance parent–child relationship. As a result, the null findings might have been due to the nature of the intervention. In addition, given the data were collected during the fluctuating pandemic, external factors such as COVID-19-related stress, lockdown measures, and coparenting support might also have moderated the effect of the intervention on parents' perceived stress and burnout (e.g., Bastiaansen et al., 2021; Vaydich & Cheung, 2022).

Limitations and Future Directions

The present findings must be interpreted in light of several limitations. First, we primarily examined one area of feasibility, i.e., initial efficacy. Although we had some data to indicate practicality and an excellent acceptability of the 21-day intervention, less than half of the participants from the intervention group responded to these items, as the items were not presented in a forced-choice response format. Future studies should ensure all participants respond to items of practicality and acceptability. Other aspects of feasibility, including demand, implementation, adaptation, integration, and expansion (Bowen et al., 2009), may also be examined through quantitative and qualitative approaches to ensure that the intervention is feasible. Relatedly, in developing the NL-MBP, we did not seek parents' input on its content, length, and format. As parents' comments and suggestions are vital to improving feasibility, follow-up studies could incorporate parents' feedback on the intervention. Also, despite the advantages of the asynchronous NL-MBP, it should be noted that the intervention was conducted with a heavy reliance on self-learning, in addition to the absence of teacher-guided inquiries, peer interactions, and a responsive teacher (Cavanagh et al., 2014). Next, we only collected post-intervention data twice, i.e., immediately and 30 days after the 21-day intervention. Future research may include additional follow-up assessments to investigate the long-term benefits of NL-MBP. Importantly, more work is needed to explore the benefits of sustained practice as a result of NL-MBP.

Past research suggested that variables such as risk status, cultural values, and length of intervention may alter the effect of mindfulness on psychological functioning (Carmody & Baer, 2009; Chen & Cheung, 2021). For instance, parents high in independent self-construal (i.e., a cultural value) may prioritize individual well-being over social concerns or harmony. Such an emphasis may moderate the effect of mindfulness practice on well-being. Hence, greater attention should be paid to the role of potential moderators on parental well-being. Also, even though the NL-MBP was not designed in response to the fluctuating COVID-19 pandemic, the study was conducted during this period (i.e., between May 2020 and January 2021). To prevent the spread of COVID-19, the Hong Kong government implemented social restrictions such as school closure and "no dine-in" measures (e.g., The Standard, 2022). In the face of social restrictions, disrupted child and family routines, reduced work-life balance, reduced family support (e.g., babysitters), scarcity of sanitizing products, unemployment, and financial burden (e.g., Freisthler et al., 2021; Yuen et al., 2020), local parents were particularly vulnerable to stress, resulting in worse mental health (Chan, 2022). Therefore, replication studies are needed to examine the effects of NL-MBP when most parents are no longer experiencing the stress brought by the pandemic. Next, the present sample consisted primarily of mothers. To increase generalizability to mothers, fathers, and other caregivers, future studies may recruit a gender-balanced and diverse sample. Furthermore, we assessed the variables using self-report questionnaires, resulting in common method bias (Podsakoff et al., 2012). Method biases are major sources of measurement error, which could threaten the validity of the conclusions about the relationships between measures (Podsakoff et al., 2003). Future research may include different scale formats (e.g., Likert scales and Guttman scales), multiple reporters, and additional measures, such as physiological and observational assessments, to minimize biases.

Because this study focused on intervening at the individual parent level, the effectiveness of the intervention may be investigated in conjunction with parallel mindfulness intervention for their children. For instance, concomitant parent and child mindfulness training has shown positive outcomes for both children with ADHD and their parents (van der Oord et al., 2012). Children receiving their version of mindfulness intervention may experience better emotion regulation and reduction in behavioral problems (Meiklejohn et al., 2012), thereby creating more mental space for their parents to benefit from the parent mindfulness intervention. Experiencing similar intervention programs over the same period may also facilitate parent–child bonding as they share common conversation and goal and reinforce each other's gains.

Author Contribution RYMC contributed to the conceptualization and methodology of the study, performed formal analyses, and wrote the original draft of the manuscript. SKCC contributed to the conceptualization and development of the 21-day mindfulness program, supervised the execution of the study, and reviewed and edited the manuscript. HC contributed to the conceptualization of the study and methodology, and reviewed and edited drafts of the manuscript. WMC contributed to the project administration and collaborated in writing and reviewed the manuscript. SYSN contributed to data processing and collaborated in writing and reviewed the manuscript.

Funding The present study was funded by The Hong Kong Jockey Club Charities Trust (Project Reference: 2019/0128) from August 2019 to July 2022.

Data, Materials, and/or Code Availability The dataset analyzed in this article is not publicly available. Requests to access the dataset should be directed to Rebecca Y. M. Cheung, Ph.D., School of Psychology and Clinical Language Sciences, Harry Pitt Building, University of Reading, Earley Gate, Reading, RG6 6ES, e-mail: rebecca.cheung@reading.ac.uk.

Declarations

Ethics Approval The present study was approved by the Survey and Behavioural Research Ethics Committee at The Chinese University of Hong Kong (Ref: SBRE-19–527) and was conducted in accordance with the ethical standards in the 1964 Declaration of Helsinki and its later amendments.

Consent to Participate Prior to the administration of the study, written informed consent was obtained from all participants.

Conflict of Interest The authors declare no competing interests.

References

Aller, T. B., Fauth, E. B., Hodgskiss, S., Sheen, J., & Levin, M. E. (2020). Mental health supportive services during COVID-19: Proposing an online, self-guided Acceptance and Commitment Therapy program for parents in the disability community. *Developmental Disabilities Network Journal, 1(2)*, 160–169. https://doi.org/10.26077/8307-528b

Aryee, S., Fields, D., & Luk, V. (1999a). A cross-cultural test of a model of the work-family interface. *Journal of Management, 25*(4), 491–511. https://doi.org/10.1177/014920639902500402

Aryee, S., Luk, V., Leung, A., & Lo, S. (1999b). Role stressors, interrole conflict, and well-being: The moderating influence of spousal support and coping behaviors among employed parents in Hong Kong. *Journal of Vocational Behavior, 54*(2), 259–278. https://doi.org/10.1006/jvbe.1998.1667

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. (2008). Construct validity of the Five Facet Mindfulness Questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329–342. https://doi.org/10.1177/1073191107313003

Baer, R. A., Lykins, E. L., & Peters, J. R. (2012). Mindfulness and self-compassion as predictors of psychological wellbeing in long-term meditators and matched nonmeditators. *The Journal of Positive Psychology, 7*(3), 230–238. https://doi.org/10.1080/17439760.2012.674548

Bastiaansen, C., Verspeek, E., & van Bakel, H. (2021). Gender differences in the mitigating effect of co-parenting on parental burnout: The gender dimension applied to COVID-19 restrictions and parental burnout levels. *Social Sciences, 10*(4), 127. https://doi.org/10.3390/socsci10040127

Bates, D., Maechler, M., Bolker, B., Walker, S., Christensen, R. H. B., Singmann, H., Dai, B., Scheipl, F., Grothendieck, G., & Green, P. (2014). *Package 'lme4': Linear mixed-effects models using Eigen and S4* (Version 1.1–7). http://CRAN.R-project.org/package=lme4

Bazzano, A., Wolfe, C., Zylowska, L., Wang, S., Schuster, E., Barrett, C., & Lehrer, D. (2015). Mindfulness-based stress reduction (MBSR) for parents and caregivers of individuals with developmental disabilities: A community-based approach. *Journal of Child and Family Studies, 24*(2), 298–308. https://doi.org/10.1007/s10826-013-9836-9

Benn, R., Akiva, T., Arel, S., & Roeser, R. W. (2012). Mindfulness training effects for parents and educators of children with special needs. *Developmental Psychology, 48*(5), 1476–1487. https://doi.org/10.1037/a0027537

Berry, J. O., & Jones, W. H. (1995). The parental stress scale: Initial psychometric evidence. *Journal of Social and Personal Relationships, 12*(3), 463–472. https://doi.org/10.1177/0265407595123009

Boekhorst, M. G. B. M., Hulsbosch, L. P., Nyklíček, I., Spek, V., Kastelein, A., Bögels, S., Pop, V. J. M., & Potharst, E. S. (2021). An online mindful parenting training for mothers raising toddlers: Assessment of acceptability, effectiveness, and personal goals. *Mindfulness, 12*(2), 519–531. https://doi.org/10.1007/s12671-020-01542-z

Bögels, S., & Restifo, K. (2013). *Mindful parenting: A guide for mental health practitioners*. Springer.

Bögels, S. M., Lehtonen, A., & Restifo, K. (2010). Mindful parenting in mental health care. *Mindfulness, 1*(2), 107–120. https://doi.org/10.1007/s12671-010-0014-5

Bögels, S. M., Hellemans, J., van Deursen, S., Römer, M., & van der Meulen, R. (2014). Mindful parenting in mental health care: Effects on parental and child psychopathology, parental stress, parenting, coparenting, and marital functioning. *Mindfulness, 5*(5), 536–551. https://doi.org/10.1007/s12671-013-0209-7

Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., Bakken, S., Kaplan, C. P., Squiers, L., & Fabrizio, C. (2009). How we design feasibility studies. *American Journal of Preventive Medicine, 36*(5), 452–457. https://doi.org/10.1016/j.amepre.2009.02.002

Brooks-Gunn, J., Han, W. J., & Waldfogel, J. (2010). First-year maternal employment and child development in the first 7 years. *Monographs of the Society for Research in Child Development, 75*(2), i-148. https://www.jstor.org/stable/25747950

Bryant, F. B., & Smith, J. L. (2015). Appreciating life in the midst of adversity: Savoring in relation to mindfulness, reappraisal, and meaning. *Psychological Inquiry, 26*(4), 315–321. https://doi.org/10.1080/1047840X.2015.1075351

Burgdorf, V., Szabó, M., & Abbott, M. J. (2019). The effect of mindfulness interventions for parents on parenting stress and youth psychological outcomes: A systematic review and meta-analysis. *Frontiers in Psychology, 10*, 1336. https://doi.org/10.3389/fpsyg.2019.01336

Camisasca, E., Miragoli, S., & Di Blasio, P. (2016). Families with distinct levels of marital conflict and child adjustment: Which role for maternal and paternal stress? *Journal of Child and Family Studies, 25*(3), 733–745. https://doi.org/10.1007/s10826-015-0261-0

Carmody, J., & Baer, R. A. (2009). How long does a mindfulness-based stress reduction program need to be? A review of class contact hours and effect sizes for psychological distress. *Journal of Clinical Psychology, 65*(6), 627–638. https://doi.org/10.1002/jclp.20555

Cavanagh, K., Strauss, C., Forder, L., & Jones, F. (2014). Can mindfulness and acceptance be learnt by self-help?: A systematic review and meta-analysis of mindfulness and acceptance-based self-help interventions. *Clinical Psychology Review, 34*(2), 118–129. https://doi.org/10.1016/j.cpr.2014.01.001

Census and Statistics Department, Hong Kong Special Administrative Region. (2021a). *Thematic Household Survey Report No. 73 - Information technology usage and penetration.* https://www.censtatd.gov.hk/en/data/stat_report/product/B1130201/att/B11302732021XXXXB0100.pdf

Census and Statistics Department, Hong Kong Special Administrative Region. (2021b). *2020 Report on Annual Earnings and Hours Survey*. https://www.legco.gov.hk/yr20-21/chinese/panels/mp/papers/mp2021b0420-rpt202104-ec.pdf

Chan, R. C. (2022). Dyadic associations between COVID-19-related stress and mental well-being among parents and children in Hong Kong: An actor–partner interdependence model approach. *Family Process*. https://doi.org/10.1111/famp.12760

Chatterji, P., Markowitz, S., & Brooks-Gunn, J. (2013). Effects of early maternal employment on maternal health and well-being. *Journal of Population Economics, 26*, 285–301. https://doi.org/10.1007/s00148-012-0437-5

Chen, M., & Cheung, R. Y. M. (2021). Testing interdependent self-construal as a moderator between mindfulness, emotion regulation, and psychological health among emerging adults. *International Journal of Environmental Research and Public Health, 18*(2), 444. https://doi.org/10.3390/ijerph18020444

Cheung, S. K. (2000). Psychometric properties of the Chinese version of the Parental Stress Scale. *Psychologia: An International Journal of Psychology in the Orient, 43*, 253–261.

Cheung, R. Y. M., & Lau, E.N.-S. (2021). Is Mindfulness linked to life satisfaction? Testing savoring positive experiences and gratitude as mediators. *Frontiers in Psychology, 12*, 470. https://doi.org/10.3389/fpsyg.2021.591103

Cheung, R. Y. M., & Ng, M. C. (2019). Mindfulness and symptoms of depression and anxiety: The underlying roles of awareness, acceptance, impulse control, and emotion regulation. *Mindfulness, 10*(6), 1124–1135. https://doi.org/10.1007/s12671-018-1069-y

Cheung, R. Y. M., & Ng, M. C. (2020). Dispositional mindful awareness and savoring positive experiences: A prospective test of cognitive reappraisal as a mediator. *Personality and Individual Differences, 163*, 110050. https://doi.org/10.1016/j.paid.2020.110050

Cheung, R. Y. M., Leung, S. S. W., & Mak, W. W. S. (2019). Role of mindful parenting, affiliate stigma, and parents' well-being in the behavioral adjustment of children with autism spectrum disorder: Testing parenting stress as a mediator. *Mindfulness, 10*(11), 2352–2362. https://doi.org/10.1007/s12671-019-01208-5

Chi, X., Bo, A., Liu, T., Zhang, P., & Chi, I. (2018). Effects of mindfulness-based stress reduction on depression in adolescents and young adults: A systematic review and meta-analysis. *Frontiers in Psychology, 1034,*. https://doi.org/10.3389/fpsyg.2018.01034

Coatsworth, J. D., Duncan, L. G., Nix, R. L., Greenberg, M. T., Gayles, J. G., Bamberger, K. T., Berrena, E., & Demi, M. A. (2015). Integrating mindfulness with parent training: Effects of the mindfulness-enhanced strengthening families program. *Developmental Psychology, 51*, 26–35. https://doi.org/10.1037/a0038212

Desrosiers, A., Vine, V., Klemanski, D. H., & Nolen-Hoeksema, S. (2013). Mindfulness and emotion regulation in depression and anxiety: Common and distinct mechanisms of action. *Depression and Anxiety, 30*(7), 654–661. https://doi.org/10.1002/da.22124

Emerson, L. M., Aktar, E., de Bruin, E., Potharst, E., & Bögels, S. (2021). Mindful parenting in secondary child mental health: Key parenting predictors of treatment effects. *Mindfulness, 12*(2), 532–542. https://doi.org/10.1007/s12671-019-01176-w

Fendel, J. C., Aeschbach, V. M., Göritz, A. S., & Schmidt, S. (2020). A mindfulness program to improve resident physicians' personal and work-related well-being: A feasibility study. *Mindfulness, 11*(6), 1511–1519. https://doi.org/10.1007/s12671-020-01366-x

Ferraioli, S. J., & Harris, S. L. (2013). Comparative effects of mindfulness and skills-based parent training programs for parents of children with autism: Feasibility and preliminary outcome data. *Mindfulness, 4*(2), 89–101. https://doi.org/10.1007/s12671-012-0099-0

Finkelstein-Fox, L., Park, C. L., & Riley, K. E. (2019). Mindfulness' effects on stress, coping, and mood: A daily diary goodness-of-fit study. *Emotion, 19*(6), 1002–1013. https://doi.org/10.1037/emo0000495

Flynn, S., Hastings, R. P., Burke, C., Howes, S., Lunsky, Y., Weiss, J. A., & Bailey, T. (2020). Online mindfulness stress intervention for family carers of children and adults with intellectual disabilities: Feasibility randomized controlled trial. *Mindfulness, 11*(9), 2161–2175. https://doi.org/10.1007/s12671-020-01436-0

Freisthler, B., Gruenewald, P. J., Tebben, E., Shockley McCarthy, K., & Price-Wolf, J. (2021). Understanding at-the-moment stress for parents during COVID-19 stay-at-home restrictions. *Social Science & Medicine, 279*, 114025. https://doi.org/10.1016/j.socscimed.2021.114025

Garland, E. L., Farb, N. A., Goldin, R., & P., & Fredrickson, B. L. (2015). Mindfulness broadens awareness and builds eudaimonic meaning: A process model of mindful positive emotion

regulation. *Psychological Inquiry, 26*(4), 293–314. https://doi.org/10.1080/1047840X.2015.1064294

Garland, E. L., Fix, S. T., Hudak, J. P., Bernat, E. M., Nakamura, Y., Hanley, A. W., Donaldson, G. W., Marchand, W. R., & Froeliger, B. (2021). Mindfulness-oriented recovery enhancement remediates anhedonia in chronic opioid use by enhancing neurophysiological responses during savoring of natural rewards. *Psychological Medicine, 1–10*,. https://doi.org/10.1017/S0033291721003834

Garland, E. L., Hanley, A. W., Goldin, P. R., & Gross, J. J. (2017a). Testing the mindfulness-to-meaning theory: Evidence for mindful positive emotion regulation from a reanalysis of longitudinal data. *PLoS ONE, 12*(12), e0187727. https://doi.org/10.1371/journal.pone.0187727

Garland, E. L., Thielking, P., Thomas, E. A., Coombs, M., White, S., Lombardi, J., & Beck, A. (2017b). Linking dispositional mindfulness and positive psychological processes in cancer survivorship: A multivariate path analytic test of the mindfulness-to-meaning theory. *Psycho-Oncology, 26*(5), 686–692. https://doi.org/10.1002/pon.4065

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research, 57*(1), 35–43. https://doi.org/10.1016/S0022-3999(03)00573-7

Harris, P. A., Taylor, R., Minor, B. L., Elliott, V., Fernandez, M., O'Neal, L., McLeod, L., Delacqua, G., Delacqua, F., Kirby, J., & Duda, S. N. (2019). The REDCap consortium: Building an international community of software platform partners. *Journal of Biomed Informatics, 95*, 103208. https://doi.org/10.1016/j.jbi.2019.103208

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research Electronic Data Capture (REDCap—A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics, 42*(2), 377–381. https://doi.org/10.1016/j.jbi.2008.08.010

He, X. Y., Li, C. B., Qian, J., Cui, H. S., & Wu, W. Y. (2010). Reliability and validity of a Generalized Anxiety Disorder scale in general hospital outpatients. *Shanghai Archives Psychiatry, 22*(4), 200–203. https://doi.org/10.3969/j.issn.1002-0829.2010.04.002

Hook, J. L., Ruppanner, L., & Casper, L. M. (2022). Occupational characteristics and parents' childcare time. *Journal of Marriage and Family, 84*(1), 210–229. https://doi.org/10.1111/jomf.12768

Hou, J., Wong, S. Y., Lo, H. H., Mak, W. W., & Ma, H. S. (2014). Validation of a Chinese version of the Five Facet Mindfulness Questionnaire in Hong Kong and development of a short form. *Assessment, 21*(3), 363–371. https://doi.org/10.1177/1073191113485121

Johansson, M., Benderix, Y., & Svensson, I. (2020). Mothers' and fathers' lived experiences of postpartum depression and parental stress after childbirth: A qualitative study. *International Journal of Qualitative Studies on Health and Well-Being, 15*(1), 1722564. https://doi.org/10.1080/17482631.2020.1722564

Jones, L., Hastings, R. P., Totsika, V., Keane, L., & Rhule, N. (2014). Child behavior problems and parental well-being in families of children with autism: The mediating role of mindfulness and acceptance. *American Journal on Intellectual and Developmental Disabilities, 119*(2), 171–185. https://doi.org/10.1352/1944-7558-119.2.171

Jung, N., & Kim, M. (2021). Assessing work-family conflict experienced by Chinese parents of young children: Validation of the Chinese version of the Work and Family Conflict Scale. *Child Psychiatry & Human Development*. https://doi.org/10.1007/s10578-021-01236-0

Kabat-Zinn, J. (1994). *Wherever you go, there are you: Mindfulness meditation in everyday life*. Hyperion.

Kabat-Zinn, J. (2009). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delta.

Kabat-Zinn, J. (2011). Some reflections on the origins of MBSR, skillful means, and the trouble with maps. *Contemporary Buddhism, 12*(1), 281–306. https://doi.org/10.1080/14639947.2011.564844

Kabat-Zinn, J. (2012). *Mindfulness for beginners: Reclaiming the present moment—and your life*. Sounds True.

Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review, 31*(6), 1041–1056. https://doi.org/10.1016/j.cpr.2011.04.006

Kunimatsu, M. M., & Marsee, M. A. (2012). Examining the presence of anxiety in aggressive individuals: The illuminating role of fight-or-flight mechanisms. *Child & Youth Care Forum, 41*(3), 247–258. https://doi.org/10.1007/s10566-012-9178-6

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Lam, C. M. (2015). Reflective inquiry on professionals' views on parents and about parenting. *The Open Family Studies Journal, 7*(1), 96–102. https://doi.org/10.2174/1874922401507010096

Lam, K. S. (2021). The five biggest factors that may influence Hong Kong home prices in the year ahead. *South China Morning Post*. https://www.scmp.com/business/article/3161224/five-biggest-factors-may-influence-hong-kong-home-prices-year-ahead

Lewis, R., Liu, Y., Groh, M., & Picard, R. (2021). Habit formation dynamics: Finding factors associated with building strong mindfulness habits. *International Conference on Human-Computer Interaction, 1421*, 348–356. https://doi.org/10.1007/978-3-030-78645-8_44

Li, A. C., Wong, K. K., Chio, F. H., Mak, W. W., & Poon, L. W. (2022). Delivering mindfulness-based interventions for insomnia, pain, and dysfunctional eating through a text messaging app: Three randomized controlled trials investigating the effectiveness and mediating mechanisms. *Journal of Medical Internet Research, 24*(5), e30073. https://doi.org/10.2196/30073

Lunsky, Y., Albaum, C., Baskin, A., Hastings, R., Hutton, S., Steel, L., Wang, W., & Weiss, J. (2021). Group virtual mindfulness-based intervention for parents of autistic adolescents and adults. *Journal of Autism and Developmental Disorders, 51*(11), 3959–3969. https://doi.org/10.1007/s10803-020-04835-3

Ma, Y., & Siu, A. F. (2016). A qualitative exploration of an eight-week mindful parenting program for parents. *Journal of Asia Pacific Counseling, 6*(2), 87–100. https://doi.org/10.18401/2016.6.2.2

Maltz, M. (1969). *Psycho-cybernetics*. Prentice Hall.

McConnell, P. A., & Froeliger, B. (2015). Mindfulness, mechanisms and meaning: Perspectives from the cognitive neuroscience of addiction. *Psychological Inquiry, 26*(4), 349–357. https://doi.org/10.1080/1047840X.2015.1076701

Meiklejohn, J., Phillips, C., Freedman, M. L., Griffin, M. L., Biegel, G., Roach, A., Frank, J., Burke, C., Pinger, L., Soloway, G., Isberg, R., Sibinga, E., Grossman, L., & Saltzman, A. (2012). Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students. *Mindfulness, 3*(4), 291–307. https://doi.org/10.1007/s12671-012-0094-5

Melville, K. M., Casey, L. M., & Kavanagh, D. J. (2010). Dropout from Internet-based treatment for psychological disorders. *British Journal of Clinical Psychology, 49*(4), 455–471. https://doi.org/10.1348/014466509X472138

Miner, R. (2019). *Mindful parenting: Associations with parental depression and well-being* (Publication No. 13895547) [Doctoral dissertation, Colorado State University]. ProQuest Dissertations Publishing.

Moreira, H., & Canavarro, M. C. (2018). The association between self-critical rumination and parenting stress: The mediating role of

mindful parenting. *Journal of Child and Family Studies, 27*(7), 2265–2275. https://doi.org/10.1007/s10826-018-1072-x

Newnham, E. A., Hooke, G. R., & Page, A. C. (2010). Monitoring treatment response and outcomes using the World Health Organization's Wellbeing Index in psychiatric care. *Journal of Affective Disorders, 122*(1–2), 133–138. https://doi.org/10.1016/j.jad.2009.06.005

Ng, F. F. Y., & Wei, J. (2020). Delving into the minds of Chinese parents: What beliefs motivate their learning-related practices? *Child Development Perspectives, 14*(1), 61–67. https://doi.org/10.1111/cdep.12358

Ng, A. P. P., Chin, W. Y., Wan, E. Y. F., Chen, J., & Lau, C. S. (2020). Prevalence and severity of burnout in Hong Kong doctors up to 20 years post-graduation: A cross-sectional study. *British Medical Journal Open, 10*, e040178. https://doi.org/10.1136/bmjopen-2020-040178

Organisation for Economic Co-operation and Development. (n.d.). *Hours Worked.* https://data.oecd.org/emp/hours-worked.htm

Petcharat, M., & Liehr, P. (2021). Feasibility of a brief mindfulness intervention: Examining stress, anxiety and mindfulness for Thai parents of children with developmental disabilities. *Archives of Psychiatric Nursing, 35*(5), 418–426. https://doi.org/10.1016/j.apnu.2021.06.002

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 87. https://doi.org/10.1037/0021-9010.88.5.879

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*(1), 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Ponnet, K., Wouters, E., Goedemé, T., & Mortelmans, D. (2016). Family financial stress, parenting and problem behavior in adolescents: An actor-partner interdependence approach. *Journal of Family Issues, 37*(4), 574–597. https://doi.org/10.1177/0192513X13514409

Potharst, E. S., Boekhorst, M. G., Cuijlits, I., Van Broekhoven, K. E., Jacobs, A., Spek, V., Nyklíček, I., Bögels, S. M., & Pop, V. J. (2019). A randomized control trial evaluating an online mindful parenting training for mothers with elevated parental stress. *Frontiers in Psychology, 10*, 1550. https://doi.org/10.3389/fpsyg.2019.01550

Potharst, E. S., Baartmans, J. M. D., & Bögels, S. M. (2021). Mindful parenting training in a clinical versus non-clinical setting: An explorative study. *Mindfulness, 12*(2), 504–518. https://doi.org/10.1007/s12671-018-1021-1

R Core Team. (2021). R: A language and environment for statistical computing. *R Foundation for Statistical Computing*. https://www.R-project.org/

Ruppanner, L., Maltby, B., Hewitt, B., & Maume, D. (2021). Parents' sleep across weekdays and weekends: The influence of work, housework, and childcare time. *Journal of Family Issues, 1–27*,. https://doi.org/10.1177/0192513X211017932

Shaffer, E. J., Lape, J. E., & Salls, J. (2020). Decreasing stress for parents of special needs children through a web-based mindfulness program: A pilot study. *Internet Journal of Allied Health Sciences and Practice*, *18*(4), Article 16. https://doi.org/10.46743/1540-580X/2020.1887

Segal, Z. V., Williams, M., & Teasdale, J. (2018). *Mindfulness-based cognitive therapy for depression*. Guilford Publications.

Sommers-Spijkerman, M., Austin, J., Bohlmeijer, E., & Pots, W. (2021). New evidence in the booming field of online mindfulness: An updated meta-analysis of randomized controlled trials. *JMIR Mental Health, 8*(7), e28168. https://doi.org/10.2196/28168

Spadaro, K. C., & Hunker, D. F. (2016). Exploring the effects of an online asynchronous mindfulness meditation intervention with nursing students on stress, mood, and cognition: A descriptive study. *Nurse Education Today, 39*, 163–169. https://doi.org/10.1016/j.nedt.2016.02.006

Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing Generalized Anxiety Disorder: The GAD-7. *Archives of Internal Medicine, 166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

Teper, R., Segal, Z. V., & Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Current Directions in Psychological Science, 22*(6), 449–454. https://doi.org/10.1177/0963721413495869

The Standard. (2022). Retrieved from no dine-in after 6pm starting Jan 7, premises to close: Carrie Lam. https://www.thestandard.com.hk/breaking-news/section/4/185520/No-dine-in-after-6pm-starting-Jan-7,-premises-to-close:-Carrie-Lam

Trammel, R. C. (2015). Mindfulness as enhancing ethical decision-making and the Christian integration of mindful practice. *Social Work and Christianity, 42*(2), 165–177.

Tsang, K. K. (2018). The structural causes of teacher burnout in Hong Kong. *Chinese Education & Society, 51*(6), 449–461. https://doi.org/10.1080/10611932.2018.1570797

Van der Oord, S., Bögels, S. M., & Peijnenburg, D. (2012). The effectiveness of mindfulness training for children with ADHD and mindful parenting for their parents. *Journal of Child and Family Studies, 21*(1), 139–147. https://doi.org/10.1007/s10826-011-9457-0

Vaydich, J. L., & Cheung, R. Y. M. (2022). Parental burnout during the second year of the COVID-19 Pandemic: Exploring the role of parenting stressors and coparenting support. *The Family Journal*. https://doi.org/10.1177/10664807221123556

Wahbeh, H., Svalina, M. N., & Oken, B. S. (2014). Group, one-on-one, or internet? Preferences for mindfulness meditation delivery format and their predictors. *Open Medicine Journal, 1*, 66–74. https://doi.org/10.2174/1874220301401010066

Williams, M., & Penman, D. (2011). *Mindfulness: A practical guide to finding peace in a frantic world.* Hachette.

Wheatley, D. (1997). Stress, anxiety and depression. *Stress Medicine, 13*(3), 173–177. https://doi.org/10.1002/(SICI)1099-1700(199707)13:3%3c173::AID-SMI739%3e3.0.CO;2-6

Wong, D. F. K., Lam, D. O. B., & Kwok, S. Y. C. L. (2003). Stresses and mental health of fathers with younger children in Hong Kong: Implications for social work practices. *International Social Work, 46*(1), 103–119. https://doi.org/10.1177/0020872803046001794

World Health Organization. (1998). *Wellbeing measures in primary health care/The DepCare Project: Report on a WHO meeting: Stockholm, Sweden, 12–13 February 1998.*

Yu, X., Tam, W. W. S., Wong, P. T. K., Lam, T. H., & Stewart, S. M. (2012). The Patient Health Questionnaire-9 for measuring depressive symptoms among the general population in Hong Kong. *Comprehensive Psychiatry, 53*(1), 95–102. https://doi.org/10.1016/j.comppsych.2010.11.002

Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The psychological causes of panic buying following a health crisis. *International Journal of Environmental Research and Public Health, 17*(10), 3513. https://doi.org/10.3390/ijerph17103513