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Mindfulness as a potential moderator between child behavior problems and maternal well-being

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Abstract:	Mindfulness-based programmes can help lower psychological distress among parents of children with developmental disabilities. However, less is known about the functions of mindfulness in relation to parental outcomes. In a cross-sectional survey, mothers of children with developmental disabilities (N =313) reported on their child's behaviour problems, trait mindfulness, mindful parenting, and a range of outcomes (anxiety and depression symptoms, parenting stress, family satisfaction, and positive gain). Neither trait mindfulness or mindful parenting acted as moderators between child behaviour problems and outcome variables, although both had main effect (compensatory) associations with parent outcomes. Benefits of mindfulness-based programmes may be general rather than specifically in the context of high child behaviour problems, given the lack of evidence for the moderating function of mindfulness. Trait mindfulness and mindful parenting had main effect (compensatory) associations with well-being and psychological distress. However, neither acted as moderators between child behaviour problems and well-being. Potential benefits of mindfulness-based programmes may be general rather than specifically in the context of high risk conditions (e.g., high child behaviour problems) given the lack of evidence for the moderating function of mindfulness.

Mindfulness as a potential moderator between child behavior problems and maternal well-being

Abstract

Mindfulness-based programmes can help lower psychological distress among parents of children with developmental disabilities. However, less is known about the functions of mindfulness in relation to parental outcomes. In a cross-sectional survey, mothers of children with developmental disabilities (*N*=313) reported on their child's behaviour problems, trait mindfulness, mindful parenting, and a range of outcomes (anxiety and depression symptoms, parenting stress, family satisfaction, and positive gain). Neither trait mindfulness or mindful parenting acted as moderators between child behaviour problems and outcome variables, although both had main effect (compensatory) associations with parent outcomes. Benefits of mindfulness-based programmes may be general rather than specifically in the context of high child behaviour problems, given the lack of evidence for the moderating function of mindfulness.

KEYWORDS: PARENTING; MINDFULNESS; BEHAVIOR PROBLEMS; DEVELOPMENTAL DISABILITY; MOTHERS.

Parenting a child with a developmental disability (DD) is associated with increased risk for psychological distress, anxiety, and depression (Estes et al., 2013; Olsson & Hwang, 2001). The differences between parents of typically developing children and those with DD are apparent by the time the child is five years old (Totsika et al., 2011) and is linked to the frequency and severity of child behavior problems. Child behavior problems have an established correlation with parental distress; the higher the frequency and severity of child behavior problems, the higher the parental distress (Bourke-Taylor et al., 2012; Hastings, 2016).

Mindfulness-based programmes (MBPs) are often adapted for specific populations (Loucks et al., 2022), and there are extant MBPs that have been adapted to better serve the needs of parents (e.g., Behbahani et al., 2018; Jones et al., 2017). Mindfulness is defined as deliberately paying attention to the present moment experience, in a non-judgemental way (Kabat-Zinn, 2013). It is a complex construct, and the term 'mindfulness' has been used by researchers to in a variety of ways, to "describe a theoretical construct (mindfulness), a practice of cultivating mindfulness (such as meditation), or a psychological process (being mindful)" (Germer, 2005, pg. 6). Some researchers have explored how mindfulness might be applied to address the needs of parents. Duncan et al. (2009) proposed an operational definition of mindful parenting, proposing that it is an extension of mindful awareness into the social context of parent-child relationships. Mindful parenting, therefore, as a single meta-construct, is about bringing those qualities already inherent/evoked in mindfulness practice (such as awareness and attention, acceptance of one's current experience in a non-judgemental manner) to the intrapersonal and interpersonal domain of parenting. Intrapersonal in this context means that parents may have a meta-awareness of their internal states and how they relate to their internal experience. Mindful parenting is also

about the interpersonal relationship between parent and child, such as how present parents are when with their children, and whether they are able to bring an attitude of acceptance and compassion towards their child and themselves. It is therefore useful to further examine potential links between mindful parenting and trait mindfulness and parental well-being, as this could lead to more effective adaptations of MBPs for parents.

Before moving on to the research evidence, it is important to first clarify the theoretical distinction between trait mindfulness and mindful parenting (a state). Trait mindfulness reflects an individuals' general dispositional level of mindfulness (assumed to be relatively stable across situations and time), whereas mindful parenting measures a state during a particular context – for example, how mindful is the parent when interreacting with their child? The research on the ways trait mindfulness and mindful parenting may overlap or be distinct is underdeveloped (e.g., does mindful parenting have unique effects beyond trait mindfulness?), but there is some emergent evidence that trait mindfulness and mindful parenting are distinct. Laurent et al. (2017) reported that in the Still Face Paradigm (considered a mild stressor), self-ratings of mindful parenting was associated with faster cortisol recovery in parents, but trait mindfulness was not. Parent et al. (2016) found that trait mindfulness was related to both positive and negative parenting practices via mindful parenting, indicating a pathway of influence. These links between state and trait mindfulness and parenting would be helpful to further explore, as understanding them may lead to the refinement of MBPs for parents.

Some research has examined whether trait and state mindfulness are associated with parental outcomes in parents of children with DD. MacDonald and Hastings (2008) reported a significant positive relationship between mindful parenting and fathers of children with DD being more involved in child-related parenting tasks. Beer et al. (2013)

conducted a survey with 28 parents of children with Autism Spectrum Disorder (ASD), and reported a link between higher levels of mindful parenting (Duncan, 2007) with lower depression and stress scores. Among family caregivers of people with DD, the results from a longitudinal study showed that the trait mindfulness facets of 'acting with awareness' and 'non-reacting' predicted lower anxiety and depression six months later (Onate & Calvete, 2019). These studies, although from different populations and with different methodologies, do together suggest that higher trait mindfulness and mindful parenting (state mindfulness) are associated with reduced negative outcomes for parents. As such, these studies also tentatively support that both trait mindfulness and mindful parenting may be functioning as compensatory factors (i.e., they have a main effect positive relationship with outcomes – associated with reduced psychological problems).

Researchers have also examined whether trait mindfulness could function as a moderator variable among parents of children with DD. Chan and Lam (2017) examined whether trait mindfulness alters the strength of a relationship between child behavior problems and parental outcomes in 271 families. They reported that when child behavior problems were measured by teachers' reports (third party), trait mindfulness moderated the association between child behavior problems and parental stress. A moderation effect was, in contrast, not found when child behaviour problems were reported by the parent. The authors concluded that there is, therefore, some support for trait mindfulness acting as a moderator, as the teacher reports of child behavior problems prevented same-rater bias. Wang et al. (2021) surveyed 2237 parents of children with a DD, and reported that trait mindfulness moderated the relationship between child behavior problems and parental mental health. The negative association between child behavior problems and parental mental health was stronger for those with lower trait mindfulness scores – suggesting that

trait mindfulness may act as a buffer. However, these findings do require additional research attention – in particular in terms of the putative differential moderating functions of trait mindfulness and mindful parenting.

There are several published intervention studies evaluating MBPs for parents with children with DD (see Rayan & Ahmad, 2018; Osborn et al., 2021 for reviews). Mindfulness-based programmes are evidence-based, aim to increase well-being, and have been adapted for parents of children with DD (Rayan & Ahmad, 2018; Singh et al., 2006; 2007; 2010). The research thus far broadly suggests that MBPs are beneficial for parents of children with DD on a number of outcomes, such as lowered parenting stress and psychological distress. Dumas (2005) proposed that mindfulness, when made a core part of parenting interventions, could help reduce the automaticity within parent-child relationships by bringing attention and awareness to automatic, negative patterns (such as being critical and quick to anger if their child does something that irritates them). Once these patterns are identified, the task might be to uncover alternative ways of responding (rather than automatically reacting) to their child. Mindfulness-based programmes, therefore, may help parents to regulate responses during stressful situations. This may be particularly pertinent for parents of children with DD, where higher parental stress is correlated with the frequency and severity of the behavior problems of their child (Bourke-Taylor et al., 2012; Hastings, 2002). If trait mindfulness and/or mindful parenting can be taught or developed, then an important research question is to further understand the mechanisms by which MBPs may have their effect on parental well-being. From an intervention perspective, trait and state mindfulness regulating parents' responses in stressful situations suggests a potential moderating function for mindfulness.

The aim of this study was to expand the current research by exploring if trait mindfulness and/or mindful parenting function as moderators on relationships between child behavior problems and parental outcomes in a large UK cross-sectional sample. The parental outcomes that have been frequently examined in the literature on mindfulness and parents of children with DD are key psychological processes such as anxiety, depression, and stress symptoms (Beer et al., 2013; Chan & Lam, 2017; Onate & Calvete, 2019). There is a call among researchers to include positive aspects of the experiences of families with children with DD, such as family satisfaction, their child being a source of joy, and changing ones perspective on life as to what is most important (Hastings, 2016; Hastings & Taunt, 2002). Some researchers have explored mindfulness and positive aspects of raising a child with a DD, and found that with parents who scored higher on mindfulness measures also reported higher positive gain (Jones et al., 2014). This approach of exploring positive perceptions also has parallels with the focus of MBPs, which are not only about reducing psychological distress, but are also more broadly about human flourishing (Malinowski, 2013). The research question explored here is: does trait mindfulness and/or mindful parenting function as moderators on relationships between child behavior problems and parental outcomes? We examined a range of parent-reported psychological outcomes including general mental health, stress, positive perceptions relating to the child with DD, and family satisfaction.

Method

Participants

The participants were 313 mothers (Mean age=42.7 years, *SD*=6.5) of children with DD aged between 4 and 15 years old (*M*=9.7 years, *SD*=3.0). The majority (96%) were biological mothers, 3% were adoptive mothers, and 1% were foster mothers, of these, 99%

were the primary carer for their child. The majority of mothers were White (97%), 2% were Asian, and the remaining 1% were Black or of a mixed ethnic background. All demographic data were self-reported. See Table 1 for further demographic details and mean scores for the measures.

----------Insert Table 1 about here----------

Measures

Seven measures were used, plus demographic data gathered. These are described below.

Parenting stress. This was measured using a seven-item version of the Parent and Family Problems scale from the Questionnaire on Resources and Stress- short Form (QRSF7: Griffith et al., 2011). The scale was developed by Griffith et al. (2011) from the QRS-F (Friedrich et al., 1983). An example of a scale item is "Caring for N puts a strain on me." Participants are asked to circle "True" or "False" in response and a summed score is used. In the present dataset, a Kuder–Richardson coefficient for the seven-item scale of .90 was obtained (Halstead et al., 2018). Higher scores indicate higher parenting stress.

Positive Perceptions. The Positive Gain Scale (PGS: Jess et al., 2020; Pit-ten Cate, 2003) is a seven-item scale which measures the positive aspects of raising a child with a disability. An example item is "Since having this child I have a greater understanding of other people," and participants rate themselves using a five-point Likert-type scale from 0 (strongly agree) to 4 (strongly disagree). Previous research has reported that the PGS has face and content validity (Pit-ten Cate, 2003), and an internal consistency coefficient of .88 in parents of children with DD (Jess et al., 2020). Cronbach's alpha coefficient for the present sample of mothers was .85 (Halstead et al., 2018). A summed score from the seven items is used, and higher scores indicate more positive perceptions of gain.

Anxiety and Depression. Anxiety and depression symptoms over the past seven days were measured by the Hospital Anxiety and Depression Scale (HADS: Zigmond & Snaith, 1983). The HADS comprises of fourteen items, seven depression items (e.g., "I feel as if I am slowed down") and seven anxiety items (e.g., "I get sudden feelings of panic"). The total scores of the two subscales were used to assess depression and anxiety separately, and higher scores indicate greater anxiety and depression The HADS has been used before with parents of children with DD and has good psychometric properties, with Cronbach's alpha at .85 for maternal anxiety and .78 for maternal depression (Jones et al., 2014). In the present sample, Cronbach's alpha coefficients for mothers were .85 for depression and .86 for anxiety (Halstead et al., 2018).

Family Satisfaction. This was measured by the Family Satisfaction Scale (Olson & Wilson, 1982), a 14-item scale. Participants are asked to respond to 14 items (such as "Your family's ability to cope with stress" and "The quality of communication between family members") on a 5 point Likert scale ranging from 1- extremely dissatisfied to 5- extremely satisfied. The total score was used, and the higher the score, the higher reported family satisfaction. Coefficient alpha has been reported for the scale as .92 and the scale is unifactorial (Olson & Wilson, 1989). Cronbach's alpha coefficient for mothers in this dataset for the total family satisfaction score was .94 (Halstead et al., 2018).

Child Behavioral and Emotional Problems. The behavior problems of the child with DD were measured using the Strengths and Difficulties Questionnaire (SDQ: Goodman et al., 1997). There are 25 items scored using a three point scale from 0 (*not true)* to 2 (*certainly true)*, higher scores are indicative of higher levels of behavior problems. The SDQ has five subscales including four problem behavior subscales assessing Conduct disorder, Emotional Symptoms, Hyperactivity, and Peer Problems, along with a Pro-social Behavior subscale. A

total difficulties score is produced by summing the four problem behavior subscales. Jones et al. (2014) reported good internal consistency (Cronbach's alpha coefficient .78) with mothers of children with autism. Cronbach's alpha coefficient for the total difficulties score was .86 in this present sample (Halstead et al., 2018).

Bangor Mindful Parenting Scale (BMPS). The 15-item BMPS is a measure of state parenting mindfulness for parents of children with DD, and has been used in a number of studies examining mindful parenting including intervention studies (Jones et al., 2014; Jones et al., 2017; Lunsky et al., 2017). Items on the BMPS represent each of the five underlying constructs of the Five Facet Mindfulness Questionnaire (FFMQ: Non-reactivity, Observing, Acting with awareness, Describing, and Non-judging), and higher scores indicate increased mindfulness in the parenting context. A total score is produced using all 15 items. Example items are " I rush through activities with my child without being attentive to him/her" and "When I get upset with my child I am able to keep calm". The BMPS has good internal reliability and construct validity (Griffith & Hastings, 2022). Jones et al. (2014) reported initial good internal consistency for the total BMPS score (Cronbach's alpha) of .79 for mothers and .78 for fathers. Jones et al. (2014) reported evidence for construct validity with correlations between the BMPS and the FFMQ total score for mothers of r=.77, and for fathers of r=.75. In the current sample, Cronbach's alpha for the total BMPS score was .78

Five Facet Mindfulness Questionnaire-Short Form. A short form of the FFMQ (Bohlmeijer et al., 2011) measured trait mindfulness in mothers. The FFMQ-SF is adapted from the FFMQ 39 item questionnaire (Baer et al., 2008), and has 24 items which measure five facets of mindfulness: Observing, Describing, Acting with Awareness, Non-judging, and Non-reacting. Example items are "I notice the smells and aromas of things" and "I make judgements about whether my thoughts are good or bad". Participants were asked to rate

each item on a 5-point Likert scale ranging from 1 (Never or very rarely true) to 5 (very often or always true). Higher scores indicate greater trait mindfulness. Bohlmeijer et al. (2011) reported good construct and internal validity for the FFMQ-SF. In the present sample, the Cronbach's alpha coefficients for mothers for the total score was .85.

Procedure

Ethical approval for the study was gained from Bangor University and the National Health Service (NHS). The survey was an online survey accessed via a link. Participants were recruited through distributing flyers and information sheets to relevant General Practice surgeries and secondary care services, UK charities, special educational needs schools, and DD parent support groups. In addition, recruitment via social media (Twitter and Facebook) was utilized. Of the 324 mothers who completed the survey, 11 were excluded as their children were outside the stipulated age limits.

Data analysis

We applied a series of separate linear regression models using the lm function in R (R Core Team, 2019; Tingly et al., 2014) to test whether mindfulness moderated the relationship between child behavior scores and maternal outcomes. Each model contained: a measure of mindfulness (see below, z-scored to avoid multicollinearity issues), total SDQ scores (again, z-scored), and the interaction of these two measures, plus covariates: the first two polynomials of parental age (i.e. linear and quadratic to account for possible non-linear associations of age with psychological accounts), parental cohabitation (parents cohabiting as the reference category), parental education (no formal education as the reference category), child diagnosis (intellectual disability other than ASD or Down's syndrome as the reference category), child age, and parental employment (unemployed as the reference category). Separate models were fitted using the FFMQ-SF (which measures trait

mindfulness) and BMPS (which measures mindful parenting) for the five parental outcomes (depression and anxiety symptoms, family satisfaction, parental stress, and positive gain) for a total of 10 models. We examined each putative moderator separately for ease of interpretation.

Results

To identify control variables for the moderation analysis, all available demographic variables were tested using Pearson's correlations for continuous variables and one-way ANOVAs for categorical variables. These were conducted on available maternal and child demographic variables, with all outcome variables to test for potential covariates (see Table 2). We included the following covariates in the main analyses as they had a significant association with at least one outcome: maternal age, cohabitation with a partner, maternal education (categorical variable of: no formal education, fewer than five high school qualifications, three or more A-levels/ high school diploma, University degree, or Postgraduate degree), maternal employment (fulltime, part time, unemployed, or self-employed), child age, and child diagnosis (ASD, Down's syndrome or other intellectual disabilities). Correlations between key study variables are summarized in Table 3.

----Insert Tables 2 and 3 about here----

Moderation analyses with mindful parenting (BMPS)

The main effects of mindful parenting was significant across all outcomes, with higher mindful parenting predicting lower anxiety and depression symptoms, parent stress; and higher positive gain and family satisfaction (see Table 4). The main effects of child behavior problems were significant for all but one outcome variable. Child behavior problems were positively associated with maternal anxiety and depression symptoms and

parenting stress, and negatively associated with family satisfaction. There was no significant association between child behavior problems and positive gain.

There were no significant interaction effects between child behavior problems and mindful parenting on any of the maternal outcome variables. Mindful parenting did not moderate the effect of child behavior problems on anxiety symptoms, depression symptoms, parenting stress, positive gain, or family satisfaction.

----Insert Table 4 about here----

Moderation analyses with trait mindfulness (FFMQ-SF)

The main effects of maternal trait mindfulness was significant for all outcome measures, which indicated that the higher mothers' trait mindfulness, the lower their reported anxiety and depression symptoms, parenting stress, and higher their reported positive gain and family satisfaction (see Table 5). The main effects of child behavior problems were significant for all outcomes except positive gain. Child behavior problems were positively associated with maternal anxiety and depression symptoms and parenting stress, and negatively associated with family satisfaction. There was no significant association between child behavior problems and positive gain.

There was no significant interaction between child behavior problems and trait mindfulness on all but one of the maternal outcome variables. Maternal trait mindfulness did not moderate the effect of child behavior problems on anxiety or depression symptoms, positive gain, or family satisfaction. There was evidence of an interaction effect for parenting stress, such that child behavior scores were more predictive of parenting stress in *more* mindful mothers (i.e., the opposite of a protective effect). In mothers with low-trait

mindfulness, there is not an association between child behavior scores and parenting stress. However, there was a pronounced ceiling effect for parenting-related stress score, with 26% of the total sample reporting the maximum score. The proportion of the sample at ceiling varied as a function of FFMQ scores: 9% of parents in the top 25% of FFMQ scores were at ceiling on the parenting stress measure, while 39% of those in the bottom 25% of FFMQ scores were at ceiling. Thus the more mindful parents, who were less often at ceiling, had room for a steeper relationship between child behavior and emotional problems and child-related stress scores, which likely drove this interaction. This relationship is shown in Figure 1.

----Insert Table 5 about here-----

---Insert Figure 1 about here----

Discussion

Both trait mindfulness and mindful parenting had significant main effect associations with all maternal outcomes (anxiety symptoms, depression symptoms, parental stress, family satisfaction and positive gain) in the presence of child behavior problems and other covariates. This may suggest that mindfulness (trait and parenting) may function as a compensatory variable (i.e., have a significant main effect relationship with the maternal outcomes). The variety of outcomes that both trait and mindful parenting is associated with is encouraging, and suggests that these factors not only are associated with lower levels of negative outcomes (depression and anxiety symptoms, stress) but are also associated with positive outcomes (family satisfaction and positive gain). If trait mindfulness and mindful parenting can be developed by attending an MBP, this potentially could offer a wide range of benefits for parents of children with DD, as higher mindfulness (state and trait) appear to

be associated with a multiple benefits. Further implications of these findings are discussed below.

We found no convincing evidence that mindful parenting acts as a moderator of the association between child behavior problems and psychological outcomes for mothers of children with DD. Across five outcome measures and two measures of mindfulness, we found evidence of moderation only for a measure of parental stress which had a substantial ceiling effect. Here the moderation was in the opposite direction to what we would expect: a weaker relationship between child behaviour and parental stress in parents with lower levels of mindfulness. The ceiling effect found on the measure of parental stress leaves us unable to tell whether the moderation in the opposite direction to expected was purely due to this measurement issue, or whether this result indicates that high mindfulness makes child behavioural problems more stressful for parents. If the ceiling effect was not such a potential confounder, we might make sense of that result as showing how, in the context of low ratings of child behaviour problems, trait mindfulness may help buffer parental stress, but in the context of high child behaviour problems, trait mindfulness does not appear to effect parenting stress scores. However, the results do not give a clear cut picture. Future work should thus use scales able to capture a greater range of parental distress in order to mitigate the likelihood of finding ceiling effects which make interpretation difficult.

Compared with other studies that examined the same moderator effects (Chan & Lam, 2017; Wang et al., 2021), the current study parallels the findings of Chan and Lam (2017) where no moderation effect was found, and is in contrast with the findings of Wang et al. (2021) who reported that trait mindfulness has a moderating effect between child behavior problems and parental stress.

It is unclear why moderation effects have not been found for mindful parenting or trait mindfulness on the variables of anxiety or depression symptoms, positive gain, or family satisfaction, and thus more replication studies are required. In particular, it is possible that mindfulness (state or trait) may act as a moderator in relation to stressors other the limited focus of current research (anxiety and depression symptoms, parenting stress, positive gain, and family satisfaction). Alternatively, it may be that we need to reconceptualise the mechanisms by which mindfulness have positive effects on parental outcomes.

Limitations

The present research expands on previous studies examining mindfulness as a moderator and parent stress as an outcome, by examining both trait mindfulness and mindful parenting, using a large sample (*N*=313) and also testing four maternal outcomes that had not before been tested, including positive outcomes. However, there are a few limiting factors that require exploration in future research. First, to establish that trait mindfulness and mindful parenting may act as a compensatory variable for parents of children with DD, longitudinal studies are required. Second, although the content of trait mindfulness and mindful parenting measures may have conceptual validity in terms of their development, there is a question over measurement overlap with the parental outcomes explored in the current research. Future research needs to examine the distinct contribution of mindfulness to parental outcomes in longitudinal designs and in the context of experimental designs. In terms of the latter, it is important to note that intervention studies including some randomized controlled trials (e.g., Dykens et al., 2014; Lunksy et al., 2017) have shown that mindfulness based interventions lead to improved parental outcomes such as stress compared to active treatment control conditions.

Additional limitations of this study include all measures being based on self-report, which can result in a response bias, and the correlational design. Additionally the sample was predominantly White and highly educated. We did not have data about non-responders to the advertised survey, but the data about educational level are suggestive of high social-economic status. Therefore, replication is needed with a sample with greater diversity. The dataset was also limited to mothers, and as there is evidence for differences between mothers' and fathers' psychological outcomes (Jones et al., 2013), it would be worth exploring similar research with fathers. The meditation experience of participants was unknown, so we do not truly know if any reports of levels of 'mindfulness' are related to traits or learned through engagement with a personal mindfulness practice. it would be useful in future research to repeat the analysis with a sample of parents who had attended a MBP to determine if having a mindfulness practice would result in trait mindfulness or mindful parenting acting as a moderator.

Future research and applications

More research is needed on the measure of mindful parenting (the BMPS) to understand how it relates to other, more established mindfulness measures, and to determine whether anything unique is being captured by this state mindful parenting measure that is distinct from trait mindfulness. In future research, it may also be useful to examine other possible influential variables such as what might be influencing a lower mindfulness score (for example, do parents with low mindfulness have younger children or children with higher behavioural problems).

Previous research on mindfulness-based interventions for both parents of typically developing children and children with DD generally find that after completing a MBP, parents report lower stress, anxiety and depression (Cachia et al., 2016), and improved

mindfulness (Benn et al., 2012). This trend is found fairly consistently in various parental populations across the literature (Coatsworth et al., 2010; 2015). The current study helps to explore possible reasons behind these findings. Higher trait and mindful parenting scores had a direct association with all maternal outcomes tested (higher family satisfaction and positive gain, and lower anxiety and depression symptoms and parental stress). A potential, tentative application of this, applied to MBP parenting intervention studies, may be that increased trait and mindful parenting per se may be drivers of observed reduction in parental distress post intervention. Therefore, it may be useful for MBPs for parents of children with DD to be very clear about which mechanism they are targeting in an intervention – such as directly target increasing trait mindfulness, as well as directly targeting how mindfulness can be applied into intra and interpersonal relationships with their child (i.e. mindful parenting).

Finally, it may be that parents of children with high levels of challenging behaviour report high stress, regardless of trait mindfulness scores. This implies that the current level of child behavior problems and parenting stress may be needed to be taken into account when determining the suitability of MBPs for parents. It may be good practice for teachers of mindfulness-based courses for parents to ask questions around stress and child behavior problems in the pre-course orientation. Researchers examining the effectiveness of MBPs for parents may also benefit from including variables of child behaviour problems and parenting stress in their design to explore these variables further.

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Table 1

Demographic characteristics and mean scores on maternal outcome variables

Variable	Score or percentage
Marital status: Married or living with partner	81.2%
Parental Education level	
University level or equivalent, or above (%)	56.3%
Parental employment – % in work (full or part-time)	60.7%
Child diagnosis- %	
Autism Spectrum Disorder	54.3%
Down Syndrome	15.3%
Mixed aetiology DD	30.4%
Child gender – Male %	72.5%
Parental anxiety – Mean (SD)	10.3 (4.6)
Parental depression – Mean (SD)	7.7 (4.6)
Parental stress– Mean (SD)	4.6 (2.2)
Parental trait mindfulness – Mean (SD)	77.4 (14)
Parental state mindfulness (mindful parenting) – Mean (SD)	29.1 (6.1)
Parental Family satisfaction – Mean (SD)	31.5 (8.7)
Parental positive perceptions – Mean (SD)	13.6 (4.9)
Child behavioural and emotional problems– Mean (SD)	26.3 (8.3)

Table 2

Associations between Demographic Variables and Maternal Outcome Variables

Variable	Anxiety	Depression	Parenting stress	Positive gain	Family satisfaction	Trait mindfulness	Mindful parenting
Maternal education	*F*=1.54	*F*=2.75*	*F*=.50	*F*=2.51	*F*=1.25	*F*=.69	*F*=.20
Cohabitation	*F*=6.32*	*F*=9.73*	*F*=2.94	*F*=2.96	*F*=6.29*	*F*=8.55**	*F*=.47
Employment status	*F*=2.93*	*F*=3.61*	*F*=5.29**	*F*=.61	*F*=4.81**	*F*=4.22**	*F*=2.60
Maternal age	*r*=-.14*	*r*=-.09	*r*=-.06	*r*=.09	*r*=-.05	*r*= .15*	*r*= .16*
Child diagnosis	*F*=13.96**	*F*=10.10**	*F*=22.25**	*F*=1.84	*F*=6.49**	*F*=13.06**	*F*=4.76**
Child age	*r*=-.00	*r*=.02	*r*=.06	*r*=.01	*r*=-.02	*r*=-.01	*r*=-.01
Child gender	*F*=3.17	*F*=0.02	*F*=6.00*	*F*<.01	*F*=.08	*F*=.30	*F*=.10

*p<.05
**p<.01

Table 3

Pearson's Correlations between Key Variables

Variable	Mindful parenting	Trait mindfulness	Anxiety	Depression	Parenting stress	Family satisfaction	Positive gain
Child behavior problems	-.293*	-.417*	.409*	.395*	.566*	-.352*	.202*
Mindful parenting	-	.528*	-.352*	-.408*	-.313*	.445*	-.272*
Trait mindfulness	-	-	-.723*	-.656*	-.435*	.495*	-.343*
Anxiety	-	-	-	.716*	.458*	-.466*	.304*
Depression	-	-	-	-	.485*	-.554*	.481*
Parent stress	-	-	-	-	-	-.419*	.239*
Family satisfaction	-	-	-	-	-	-	-.476*

*p<.01

Table 4

Moderator Analysis using Mindful Parenting (BMPS) as a Moderator

Term	Anxiety (R^2=.31, R^2 change= .0001)		Depression (R^2=.35, R^2 change < .0001)		Family satisfaction (R^2=.38, R^2 change < .0001)		Parent stress (R^2=.40, R^2 change= .0005)		Positive gain (R^2=.18, R^2 change= .0001)	
	B	*p*	*B*	*p*	*B*	*p*	*B*	*p*	*B*	*p*
Intercept	3.25	.65	-.15	.98	38.74	**< .01**	.36	.91	-.12	.99
BMPS (*z*-scored, raw variable: *M*= 29.07, *SD*=6.15)	-1.33	**< .01**	-1.71	**< .01**	3.66	**< .01**	-.28	**.01**	-1.37	**< .01**
SDQ (*z*-scored, raw variable: *M*=26.26, *SD*=8.34)	1.28	**< .01**	1.11	**< .01**	-2.02	**< .01**	1.11	**< .01**	.57	.08
Parental age, first polynomial	.45	.20	.45	.18	.08	.90	.23	.14	.48	.23
Parental age, second polynomial	-.01	.21	.00	.22	.00	.55	.00	.21	.00	.38
Parents not cohabiting	.92	.12	1.02	.08	-1.47	.17	.09	.73	.78	.26
Parental education: Fewer than 5 GCSEs or O Levels, NVQ 1, or BTECH First Diploma	-3.40	**.03**	-1.67	.26	-3.91	.15	-.86	.20	1.82	.31
Parental education: 5 or more GCSEs or O Levels, NVQ 2, or equivalent	-3.86	**.01**	-2.92	**.03**	-1.42	.57	-.80	.20	-.14	.93
Parental education: 3 or more A Levels, NVQ 3, BTECH National, or equivalent	-3.08	**.03**	-2.80	**.03**	-1.76	.47	-1.01	.09	.97	.54
Parental education: Undergraduate degree	-2.78	**.04**	-3.10	**.02**	-3.36	.16	-.55	.36	-.02	.99
Parental education: Postgraduate degree	-1.50	.30	-1.20	.39	-6.20	**.02**	-.15	.82	2.43	.14
Employment: Part-time	-.37	.48	-1.05	**.04**	1.56	.10	-.22	.34	.13	.83
Employment: Full-time	-.43	.59	-.65	.40	2.63	.07	-.78	**.03**	-.51	.58
Employment: Self-employed	-1.69	.05	-1.34	.11	6.15	**< .01**	-.88	**.02**	-.84	.40
Diagnosis: ASD	.78	.15	.55	.29	-1.85	.06	-.22	.35	.22	.73

MODERATION ANALYSIS - MOTHERS OF CHILDREN WITH DD

Diagnosis: Down's Syndrome	-.51	.51	-.27	.71	-.51	.71	-.82	**.02**	-.22	.81
Child gender: Female	-.76	.15	.13	.80	-.02	.98	-.42	.07	.05	.94
BMPS * SDQ interaction (both z-scored)	-.05	.84	.00	.99	-.62	.16	-.05	.63	.22	.45

Table 5

Moderator Analysis using Trait Mindfulness (FFMQ-SF) as a Moderator

Term	Anxiety (R^2=.56, R^2 change= .0013)		Depression (R^2=.48, R^2 change= .0001)		Family satisfaction (R^2=.36, R^2 change= .0038)		Parent stress (R^2=.43, R^2 change= .0096)		Positive gain (R^2=.19, R^2 change < .0001)	
	B	*p*	*B*	*p*	*B*	*p*	*B*	*p*	*B*	*p*
Intercept	4.70	.41	.30	.96	38.77	**< .01**	1.51	.62	-.76	.93
FFMQ-SF (*z*-scored, raw variable: *M*=77.38, *SD*=13.97)	-2.99	**< .01**	-2.62	**< .01**	3.56	**< .01**	-.48	**< .01**	-1.51	**< .01**
SDQ (*z*-scored, raw variable: *M*=26.26, *SD*=8.34)	.55	**.02**	.61	**.01**	-1.75	**< .01**	1.00	**< .01**	.41	.21
Parental age, first polynomial	.34	.23	.40	.18	.09	.88	.16	.28	.50	.21
Parental age, second polynomial	.00	.23	.00	.22	.00	.59	.00	.38	.00	.34
Parents not cohabiting	.23	.63	.43	.41	-.70	.52	-.09	.72	.50	.47
Parental education: Fewer than 5 GCSEs or O Levels, NVQ 1, or BTECH First Diploma	-2.05	.10	-.44	.74	-5.56	.05	-.60	.36	2.50	.16
Parental education: 5 or more GCSEs or O Levels, NVQ 2, or equivalent	-2.94	**.01**	-2.09	.09	-2.54	.33	-.56	.36	.27	.87
Parental education: 3 or more A Levels, NVQ 3, BTECH National, or equivalent	-2.11	.06	-1.96	.10	-2.83	.26	-.70	.24	1.32	.40
Parental education: Undergraduate degree	-1.91	.08	-2.24	.05	-4.71	.06	-.28	.63	.44	.77
Parental education: Postgraduate degree	-1.41	.22	-1.07	.39	-6.53	**.01**	.03	.96	2.44	.14
Employment: Part-time	.10	.81	-.62	.17	1.04	.28	-.23	.32	.42	.49
Employment: Full-time	-.09	.89	-.37	.59	2.22	.13	-.71	**.04**	-.36	.70
Employment: Self-employed	-.31	.65	-.37	.63	5.56	**< .01**	-.82	**.03**	-.39	.70
Diagnosis: ASD	.62	.16	.37	.44	-1.53	.13	-.17	.48	.03	.97

MODERATION ANALYSIS - MOTHERS OF CHILDREN WITH DD

Diagnosis: Down's Syndrome	.02	.98	.09	.89	-.85	.56	-.52	.13	-.22	.81
Child gender: Female	-.71	.09	.21	.65	-.21	.83	-.44	.05	.14	.82
FFMQ-SF * SDQ interaction (both z-scored)	-.17	.34	-.05	.78	-.53	.19	.21	**.03**	-.02	.95

Figure 1

Relationship between child behavior problems and parental stress, as a function of trait mindfulness. For plotting purposes, respondents were split into four equally sized quartile groups on the basis of their FFMQ scores. Statistical analyses use raw scores.

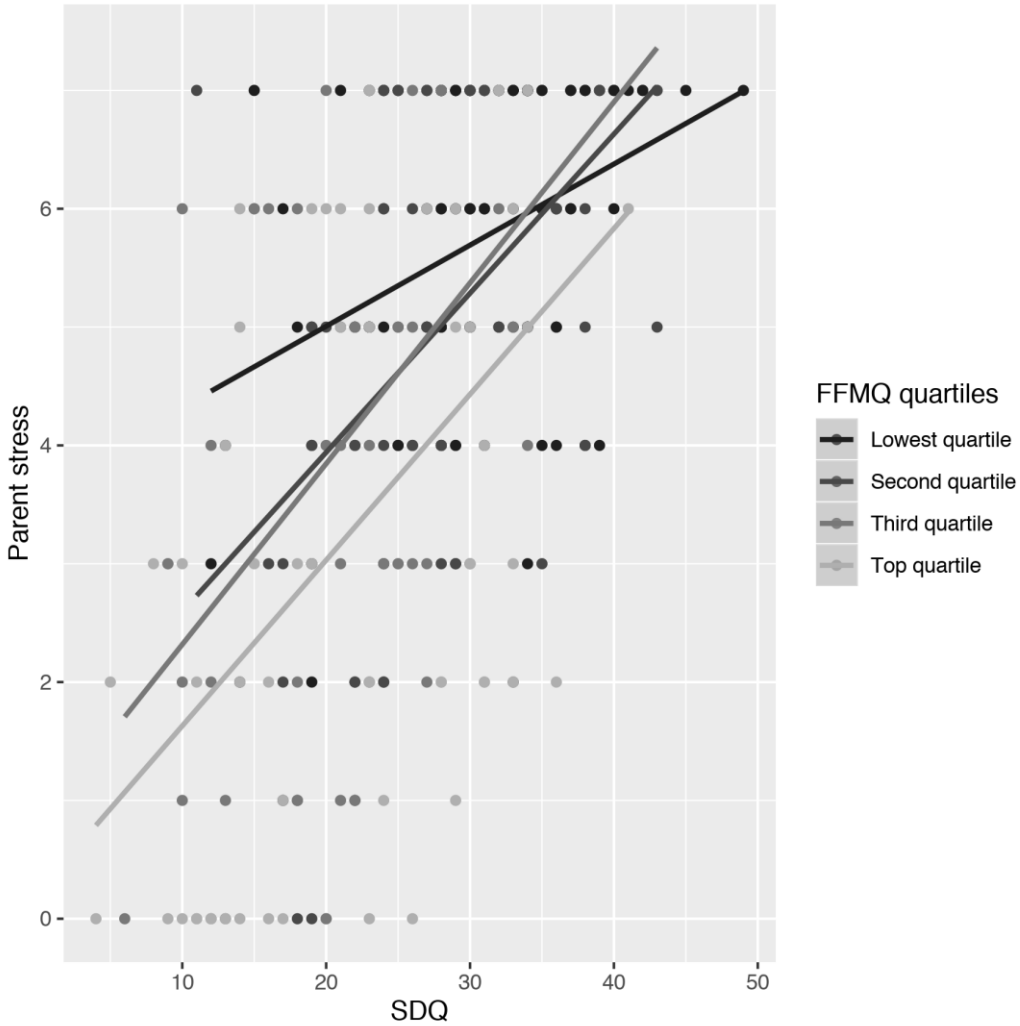

Figure 1

Trait Mindfulness as Significant Moderator between Child Behavior Problems and Parental Stress: Evidence of a Ceiling Effect