Mediator or Moderator? The Role of Mindfulness in the Association between Child Behavior Problems and Parental Stress

Tim Oi Chan and Shui-fong Lam

The University of Hong Kong

Author Note

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Correspondence concerning this manuscript should be addressed to Shui-fong Lam, Department of Psychology, the University of Hong Kong, Pokfulam Road, Hong Kong, China. E-mail: lamsf@hku.hk

Abstract

Background: Raising a child with intellectual disability (ID) may be stressful for parents. Previous studies have suggested the mediating role of mindfulness in the association between child behavior problems and parental stress.

Aims: The present study examined whether this mediating role is a result of parents' self-report bias. It also explored whether mindfulness has a moderating role instead when child behavior problems are reported by teachers.

Methods: In a questionnaire survey, 271 Chinese parents of children with ID in 6 Hong Kong special schools reported their levels of stress and mindfulness, as well as their children's behavior problems. The latter was also reported by teachers.

Results: When child behavior problems were reported by parents, parental mindfulness was a mediator between child behavior problems and parental stress. In contrast, when child behavior problems were reported by teachers, parental mindfulness was a moderator between child behavior problems and parental stress.

Conclusion: The mediation role of mindfulness maybe an artifact of measurement. The findings provide an encouraging message that parenting a child with ID and behavior problems does not necessarily mean more stress among all parents. Parents with a high level of mindfulness may experience less stress than those with a low level of mindfulness.

Keywords: mindfulness, parental stress, child behavior problems, intellectual disability**.**

What this paper adds?

Parents of children with intellectual disability (ID) tend to report high psychological stress. Previous self-report studies have identified mindfulness as a mediator in the association between child behavior problems and parental stress. The present study differs from previous studies by including third-party's reports. It has contributed to the existing body of knowledge in two respects. First, it examined whether the mediation effect resulted from parent self-report bias. Second, it tested an alternative hypothesis of the moderation effect by using teachers' reports to measure child behavior problems. The results showed that when child behavior problems were measured by parents' reports, parental mindfulness was a mediator between child behavior problems and parental stress. The more the parents reported that their children had behavior problems, the less they reported being mindful, which in turn the more stressful they were. However, when child behavior problems were measured by teachers' reports, parental mindfulness was a moderator instead, moderating the association between child behavior problems and parental stress. The association was ameliorated when parents reported high levels of mindfulness. These findings reveal another possible role of mindfulness and shed light on the support for parents of children with ID.

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1. Introduction

Parents of children with intellectual disability (ID) often report more psychological distress than parents of typically developing children (Dabrowska & Pisula, 2010; Dyson, 1997; Eisenhower, Baker, & Blacher, 2005; Roach, Orsmond, & Barratt, 1999). A recent review documented that child behavior problems are one of the major factors associated with higher stress in parents of children with ID (Biswas, Moghaddam, & Tickle, 2015). Child behavior problems, in addition to the difficulties pertaining to the core impairments of ID, have become an important stressor in parents' psychological well-being (Hastings, 2002).

Researchers have been exploring what psychological processes affect the stress level of parents of children with ID. In recent years, there has been an emerging trend to study mindfulness as one of these key psychological processes (Beer, Ward, & Moar, 2013; Jones, Hastings, Totsika, Keane, & Rhule, 2014). According to Kabat-Zinn (2003), mindfulness refers to "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (p.145). Lloyd and Hastings (2008) conducted a pioneering study that explored the association between mindfulness and psychological distress in parents of children with ID. Since then, a growing number of researchers have been studying how mindfulness-based interventions could help parents of children with disabilities (e.g., Cachia, Anderson, & Moore, 2016; Neece, 2014;

Singh et al., 2007; Van der Oord, Bogels, & Peijnenburg, 2012; Whittingham, 2014). Their studies indicated that mindfulness-based intervention could reduce psychological stress and depressive symptoms in parents of children with developmental disabilities. However, the mechanism of how mindfulness functions in the association between child behavior problems and parental stress still needs further investigation.

Some studies have investigated whether parental mindfulness was the mediator in the association between child behavior problems and stress in parents of children with Autism Spectrum Disorder (ASD) (Beer et al., 2013; Jones et al., 2014). These studies proposed that the more children had behavior problems, the less likely their parents would be mindful, which in turn predicted higher parental stress. However, their findings are inconsistent. While Jones et al. (2014) found a mediator role of parental mindfulness, Beer et al. (2013) did not.

Regardless of their inconsistent findings, these studies of mediation model (Beer et al., 2013; Jones et al., 2014) share the same limitations. They used parents' self-reports to measure all variables, including child behavior problems, parental mindfulness, and parental stress. When measures of predictor and criterion variables are obtained from the same rater, there may be self-report bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Schmitt, 1994). According to studies on cognitive consistency theories (e.g., McGuire, 1966), people tend to maintain consistency between their cognitions and attitudes. Thus, it is possible that parents may respond to measures of different constructs in consistent ways. As a result, a higher level

of child behavior problems is significantly associated with lower levels of parental mindfulness and higher levels of parental stress when they were all reported by parents. The observed association between constructs measured by same rater reports may be spurious and may not fully reflect the actual covariation that exists in real-life situations (Podsakoff et al., 2003). A solution to this methodological limitation is to adopt third-party's reports, such as teachers' reports. Unlike parents' reports, teachers' reports on children's behavior problems are not tainted by the levels of parental stress and mindfulness.

Another limitation shared by previous studies of mediation model was their assumption of causal relations between child behavior problems and parental mindfulness. In their mediation model, child behavior problems are assumed to have an impact on parental mindfulness, which in turn is assumed to have an impact on parental stress. However, the relations among these constructs may be bi-directional. It is equally possible that parents whose stress level is high tend to be less mindful. When they are less mindful and more judgmental, they may in turn tend to perceive more behavior problems in their children, even when the behavior problems are relatively infrequent or mild.

Previous studies on parents' sense of coherence may provide support to this possibility. According to Antonovsky (1987), a sense of coherence relates to one's psychological processes in the appraisal of stress. People with a higher sense of coherence tend to perceive a possible stressor as more comprehensible, manageable, and meaningful. Past studies have found that

parents of children with ID reported higher levels of distress when they had a lower sense of coherence (Oelofsen & Richardson, 2006; Olsson & Hwang, 2002). These findings imply that if parents have a lower level of mindfulness, which relates to one's lower psychological capacity to attend or accept present experiences, they may tend to perceive their children's behavior problems as less manageable, and thus report higher levels of their children's behavior problems.

Similarly, a lower level of child behavior problems does not necessarily lead to a higher level of parental mindfulness and a lower level of parental stress. This may possibly be explained with the above rationale that parents with higher levels of mindfulness may tend to perceive their children to have fewer behavior problems because they may possess a higher mental capacity to cope, even when the behavior problems of their children are in fact serious. A recent study by Neece (2014) may lend support to this inference as it found that parents of children with developmental delays reported their children to have fewer behavior problems after a mindfulness-based intervention. Therefore, it is reasonable to argue that parental mindfulness may not function as a mediator in the association between child behavior problems and parental stress. Teachers' reports of child behavior problems can serve as an independent way of measuring whether child behavior problems are still negatively associated with the levels of mindfulness reported by parents. If this relation no longer exists, then the

mediation effect suggested by previous studies (Beer et al., 2013; Jones et al., 2014) may be an artifact produced by parents' self-report bias.

In light of the above inference, child behavior problems and parental mindfulness may be two independent variables. Indeed there have been studies showing that despite the fact that parenting children with behavior problems is very stressful to most parents, it does not affect every parent in the same way and to the same extent. A recent review suggested that although child behavior problems are one of the major factors that significantly predicted higher stress in parents of children with ID (Biswas et al., 2015), the effect sizes reported for this association ranged from small (0.13) to large (0.5). The heterogeneity of effect sizes for this association indicated that it is important to identify third variables that may affect the strength of association between child behavior problems and parental stress. A possible moderating mechanism of mindfulness can be inferred: Parents who are more mindful (i.e., less reactive, less judgmental, and more aware of present experiences), may be less likely to experience stress than those who are less mindful. It is their own level of mindfulness that can buffer them against the adverse effect of their children's problem behaviors on their psychological well-being. The present study thus explores whether parental mindfulness functions as a potential moderator in the association between child behavior problems and parental stress.

The study has two objectives: 1) to examine whether the mediating role of parental mindfulness in the association between child behavior problems and parental stress is an

artifact of self-report bias; and 2) to examine whether parental mindfulness has instead a moderating role in the association between child behavior problems and parental stress. Two hypotheses were formulated with reference to these two objectives. Hypothesis 1: Mindfulness mediates the association between child behavior problems and parental stress if child behavior problems are reported by parents, but this mediation effect is absent if child behavior problems are reported by teachers. Hypothesis 2: Mindfulness moderates the association between child behavior problems and parental stress if child behavior problems are reported by teachers, but this moderation effect is absent if child behavior problems are reported by parents.

2. Methods

2.1. Participants

Participants were recruited from six special schools for children with ID in Hong Kong. The children in these schools had been diagnosed with ID by psychologists before they were admitted. Parent questionnaires were distributed to the parents of these children (N = 627) and teacher questionnaires to their homeroom teachers (N = 100). The sample of teachers was smaller than that of parents because one teacher usually reported on more than one child. The response rate of the parents was 46.73%, as 293 returned the questionnaires. The response rate of the teachers was 98%, as 98 returned the questionnaires. As the present study required both parents' and teachers' reports on each child's behaviors, cases were included only when both

reports were returned and matched with the child concerned. Thus, 22 cases were excluded because of mismatched or missing data. The final sample consisted of 271 parents.

Among the parents, 78.7% were mothers, 15.7% were fathers, and 5.6% were others. All of them were Hong Kong Chinese. Their average age was 45.44 years; most were married (84.1%); about half (52.8%) were homemakers and 41% had a job. The educational backgrounds of the parents were as follows: primary education or below (10.4%), secondary education (62.5%), tertiary education or above (27.1%). The children comprised 188 boys (69.4%) and 83 girls (30.6%). Their average age was 12.96 years, with a range from 6 to 22, and a standard deviation of 4.29. Of these children, 152 (56.1%) had mild-grade ID, and 119 (43.9%) moderate-grade ID. There were 67 children (24.7%) with co-occurring diagnoses to ID, most of them (n = 55) having been diagnosed with ASD. Most of the children (94.4%) were living with their parents.

2.2. Procedures

According to the procedures approved by the Institute Review Board of the authors, invitation letters, parental consent forms and questionnaires were sent home with the help of the school coordinator at each school. Each parent was asked to return the documents to the school coordinator in a sealed envelope. Teacher questionnaires were only given to the homeroom teachers of those children whose parents had given consent to participate in the research.

2.3. Measures

The parents completed questionnaires measuring child behavior problems, parental mindfulness, and stress, and eliciting demographic information. The children's homeroom teachers completed a child behavior problems questionnaire. As the measures in the questionnaire were originally in English, two bilingual graduate students helped in the back-translation procedures to ensure the accuracy of the Chinese questionnaires (Brislin, 1970).

2.3.1. The Behavior Problems Inventory - Short Form (BPI-S)

The BPI-S is an informant-based rating scale empirically derived from the original BPI-01 for measuring behavior problems in individuals with ID (Rojahn et al., 2012a; Rojahn et al., 2012b). The BPI-S comprises 30 items and has three subscales: Self-injurious Behavior, Aggressive/Destructive Behavior, and Stereotyped Behavior. Previous study in Chinese population has indicated that BPI-01 has good reliability and validity (An, Rojahn, Curby, & Ding, 2015). For the present study, nine items were selected from the BPI-S that could be frequently observed among Chinese students with ID. The selection was based on two criteria. First, items with relatively high prevalence rate on each subscale were selected (e.g., head hitting, pushing others, and rocking, repetitive body movements) (Rojahn et al., 2012a). Second, items with relatively high factor loadings on each subscale were selected (e.g., body hitting, grabbing and pulling others, and gazing at hands or objects) (Rojahn et al., 2012b). The

frequency scale was adopted and participants were asked to rate items on a 5-point Likert scale ranging from 1 (Never a problem) to 5 (Hourly). The Cronbach's alphas of parents' and teachers' scores for the nine items were .85 and .89, respectively, indicating good reliability. To measure the frequency of child behavior problems, the nine items were averaged to generate a total score for parents' report and teachers' report, with higher scores indicated higher levels of behavior problems.

2.3.2. Cognitive and Affective Mindfulness Scale - Revised (CAMS-R)

The CAMS-R is a 12-item self-report inventory that measures mindfulness with respect to thoughts and feelings in general daily life experience (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). The CAMS-R is a brief but broad measure of mindfulness designed to capture the four major components of mindfulness, namely, regulation of attention, awareness of experience, orientation to focus on present experience, and acceptance/nonjudgment towards experience. Participants were asked to indicate how often each item (e.g., "I can accept things I cannot change.") applies to their thoughts and feelings in general daily experience. Participants were asked to rate items on a 5-point scale ranging from 1 (Not at all) to 5 (Almost always). To measure the level of parental mindfulness, after reverse scoring of three items in the scale, all items were averaged to generate a total score for parental mindfulness, with higher scores indicating higher levels of mindfulness.

According to Feldman et al. (2007), the CAMS-R has good psychometric properties and

the Cronbach's alpha for the scale ranged from .74 to .77. For the present study, the Cronbach's alpha was .84, indicating a good level of internal consistency. The application of the CAMS-R in Chinese population has been found to be compatible with those of the original version and other inventories measuring mindfulness in the West (Chan, Lo, Lin & Thompson, 2016). In a recent study (Chan & Lam, 2017), the CAMS-R has also been used to measure the trait mindfulness of Chinese parents of children with ASD in Hong Kong.

2.3.3. Parental Stress Scale (PSS)

PSS is an 18-item self-report scale developed for the assessment of parental stress and for parents of children with and without clinical problems (Berry & Jones, 1995). PSS was chosen for this study because of its ease in administration and focus on stress generated by the parenting role (Lessenberry & Rehfeldt, 2004). PSS comprises two components representing positive themes (e.g., "I am happy in my role as a parent.") and negative themes (e.g., "The major source of stress in my life is my children.") of parenthood. Participants were asked to rate items on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), measuring level of agreement on the items. To measure the level of parental stress, after reverse scoring of eight items on the scale, all items were averaged to generate a total score for parental stress, with higher scores indicated higher levels of parental stress. According to Berry and Jones (1995), the Cronbach's alpha for the scale was .83 and test–retest reliability was .81. For the present study, the Cronbach's alpha was .88, indicating a good level of internal consistency.

3. Results

3.1. Data Analysis Strategies

Preliminary associations between demographic variables and parental stress were explored to identify confounding variables for statistical control before the main analyses. Pearson's correlations were used for continuous demographic variables (e.g., child age) and *t*-tests or ANOVA were used for dichotomous demographic variables (e.g., child's intellectual grading). These analyses revealed parental stress was not related with child age ($r = .07$, $p = .28$) but was associated significantly with three other demographic variables. First, parents of male children reported more stress than parents of female children, $t\ (277) = 2.75$, $p = .006$. Second, parents of children with moderate ID reported more stress than parents of children with mild ID, $t\ (283) = -3.04$, $p = .003$. Third, parents who reported being homemakers experienced higher stress levels than those who reported to have a job, $F\ (4, 266) = 3.67$, $p = .01$, $\eta^2 = .05$. Therefore, to control for any possible effects on parental stress, child gender, intellectual grading and parents' work force participation were entered as covariates in the subsequent mediation and moderation analyses.

3.2. Descriptive Statistics and Correlations

Means, standard deviations, and correlations of the variables are presented in Table 1. There was a strong positive correlation between the parents' and teachers' reports on children's behavior problems. There was a strong negative correlation between parental mindfulness and

stress. It is noted that parent-reported child behavior problems correlated positively with parental stress but negatively with parental mindfulness. Nevertheless, teacher-reported child behavior problems did not correlate significantly with either parental stress or mindfulness.

(Insert Table 1 about here)

3.3. Mediation Analyses

3.3.1. Mediation analysis with parent-reported behavior problems

To test Hypothesis 1, mediation analysis was conducted to investigate whether parental mindfulness mediates the association between child behavior problems and parental stress if child behavior is reported by parents. The bootstrapping method was used to test the mediation (Preacher & Hayes, 2004). This method was preferred to the conventional multiple regressions approaches because it minimizes the number of multiple regressions in the analyses and does not assume a normal sampling distribution (Shrout & Bolger, 2002). It helps to decrease the likelihood of a Type I error and tackle the power problem related to the conventional approach. In the analyses, parental stress was entered as the dependent variable, parent-reported child behavior problem as the predictor, and mindfulness as the mediator; the three control variables were entered with the SPSS macro provided by Preacher and Hayes (2004).

The results indicated that the total effect of parent-reported child behavior problems was significant (total effect = .21, $p < .001$). The indirect effect of parent-reported child behavior problems on parental stress through the mediator mindfulness was significant, with the

estimation from 1,000 bootstrap re-samples. The estimated mean of coefficients was .06 with a 95% confidence interval (CI) of 0.01 to 0.1. The direct effect of parent-reported child behavior problems on parental stress remained significant when mediator mindfulness was included (direct effect = .15, $p < .001$). In sum, the results indicated that parental mindfulness partially mediated the association between parent-reported child behavior problems and parental stress (see the upper panel of Figure 1).

(Insert Figure 1 about here)

3.3.2. Mediation analysis with teacher-reported behavior problems

To examine whether the mediating role of mindfulness was an artifact produced by self-report bias, teachers' reports of child behavior problems were entered as the predictor in the mediation analyses and its result was compared with that with parents' report. The results indicated that the total effect of teacher-reported child behavior problems on parental stress was not significant (total effect = -.005, $p = .911$). The indirect effect of teacher-reported child behavior problems on parental stress through mediator mindfulness was not significant, with the estimation from 1,000 bootstrap re-samples. The estimated mean of coefficients was -.03 with a 95% confidence interval (CI) of -0.07 to 0.02. The direct effect of teacher-reported child behavior problems on parental stress was not significant when mediator mindfulness was included (direct effect = .02, $p = .5$). In sum, the results indicate that parents' level of

mindfulness did not mediate the relationship between teacher-reported child behavior problems and parental stress (see the lower panel of Figure 1).

Comparing the results of the two mediation analyses shown in Figure 1, it is clear that Hypothesis 1 is supported. Mindfulness mediated the association between child behavior problems and parental stress when child behavior problems were reported by parents, but this mediation effect was absent if child behavior problems were reported by teachers.

3.4. Moderation Analyses

3.4.1. Moderation analysis with teacher-reported behavior problems

The second objective of the present study was to explore whether mindfulness would function as a moderator. Hypothesis 2 states that mindfulness moderates the association between child behavior problems and parental stress if child behaviors problems are reported by teachers, but this moderation effect is absent if child behavior problems are reported by parents. To test the first half of this hypothesis, a moderation analysis was performed with teacher-reported child behavior problem as the predictor according to the procedures suggested by Aiken and West (1991). The predictor and moderator were mean centered prior to the analysis. The three confounding variables were entered in Step 1, teacher-reported child behavior problem in Step 2, parental mindfulness in Step 3, and the moderation term between child behavior problem and mindfulness in Step 4.

Results showed the main effect of teacher-reported child behavior problems was not significant, β = -.01, p = .91; this indicated that parental stress was not associated significantly with child behavior problems reported by teachers. The main effect of parental mindfulness was significant, β = -.46, p < .001; this indicated that parental mindfulness was associated negatively with parental stress; this indicated that the higher the level of mindfulness parents reported, the lower the level of stress they reported. A significant interaction effect was found, β = -.21, p < .001; this indicated that parental mindfulness significantly moderated the association between child behavior problems and parental stress. When the level of parental mindfulness increased, the effect of child behavior problems on parental stress decreased. In addition, to locate the effect of child behavior problems on parental stress at different levels of mindfulness, simple slope analysis was conducted with the SPSS macro provided by Preacher and Hayes (2004). As depicted in the left panel of Figure 2, the effect of child behavior problems was significant when parental mindfulness was low (β = .15, p = .002). However, the effect of child behavior problems was not significant when parental mindfulness was medium (β = .04, p = .28) or high (β = -.07, p = .08). These results indicated that a medium or a high level of parental mindfulness could buffer the effect of child behavior problems on parental stress.

(Insert Figure 2 about here)

3.4.2. Moderation analysis with parent-reported behavior problems

To examine whether parental mindfulness would act as a moderator only when teachers' reports on child behavior problems were used, parents' reports on child behavior problems were entered as a predictor in the moderation analysis for a comparison. Results showed that the main effect of parent-reported child behavior problems was significant (β = .28, p < .001); as shown in the right panel of Figure 2, parental stress was positively associated with child behavior problems reported by parents. This indicated that the higher the level of child behavior problems reported by parents, the higher the level of stress they experienced. The main effect of parental mindfulness was significant (β = -.43, p < .001), i.e., parental mindfulness was associated negatively with parental stress. This indicated that the higher the level of mindfulness reported by parents, the lower the level of stress they experienced. However, parent-reported child behavior problems and parental mindfulness did not have any interaction effect on parental stress (β = -.04, p = .48). This indicated that parental mindfulness could not moderate the effect of child behavior problems on parental stress when child behavior was reported by parents.

Comparing the results of the two moderation analyses shown in Figure 2, it is clear that Hypothesis 2 is supported. Mindfulness moderated the association between child behavior problems and parental stress when child behavior problems were reported by teachers, but this moderation effect was absent when child behavior problems were reported by parents.

4. Discussion

The present study examined the role of mindfulness in the association between child behavior problems and stress in parents of children with ID. It tested whether the mediating role of mindfulness in such association was found only when child behavior problems were reported by parents. It also investigated whether mindfulness functions as a moderator in such association when child behavior problems were reported by teachers. Consistent with the hypotheses, the results of the present study showed that when parents' reports on child behavior problems were used, parental mindfulness partially mediated the association between child behavior problems and parental stress. A higher level of parent-reported child behavior problems was associated with a lower level of parental mindfulness, which in turn was associated with higher level of parental stress. In contrast, when teachers' reports on child behavior problems were used, parental mindfulness did not mediate the association between child behavior problems and parental stress. In fact, child behavior problems reported by teachers were not a significant predictor for either parental mindfulness or stress.

In addition, the present findings revealed that parental mindfulness was a moderator in the association between child behavior problems and parental stress when child behavior problems were reported by teachers. A medium or a high level of parental mindfulness buffered the effect of child behavior problems on parental stress. In contrast, parental mindfulness did not moderate the association between child behavior problems and parental stress when child behavior problems were reported by parents. The levels of parental mindfulness did not

alleviate the effect of child behavior problems on parental stress. Taken together, the findings of the present study indicate that the mediation effect of parental mindfulness resulted from parents' self-reports only. They also reveal the moderating role of parental mindfulness in the association between child behavior problems and parental stress.

4.1. The role of mindfulness

Unlike previous studies that relied solely on parents' self-reports for all the measures to investigate the mediating role of parental mindfulness, the present study collected additional reports on child behavior problems from teachers. This approach helps clarify the role of mindfulness in the association between child behavior problems and parental stress. The present study replicated the results of previous studies (e.g., Jones et al., 2014), and found that parental mindfulness was a mediator when child behavior problems were reported by parents. However, the mediation effect was absent once child behavior problems were reported by teachers. This contrast indicates that the mediation effect of parental mindfulness could be an artifact resulting from the reporting bias of parents, as they may tend to report more behavior problems in their children when they are less mindful and more strained. When a third-party's reports, i.e., the teachers' reports, were used to measure child behavior problems, this self-report bias was gone and so was the mediating effect of parental mindfulness.

In the present study, teacher-reported child behavior problems were not significantly correlated with parental mindfulness. This implies that child behavior problems and parental

mindfulness may be two independent variables. Contrary to the studies that relied solely on parents' reports (Beer et al., 2013; Jones et al., 2014), the present study did not reveal a negative association between child behavior problems and parental mindfulness when child behavior problems were reported by teachers. If variations in the levels of child behavior problems are independent of those in the levels of parental mindfulness, more child behavior problems do not necessarily come with a decrease in parental mindfulness. In other words, parenting a child with ID and behavior problems does not necessarily make parents less mindful and, in turn, feel more strained.

The use of teachers' reports of child behavior problems did not only show an absence of the mediating role of mindfulness, but also revealed an alternative role of mindfulness. Parental mindfulness could function as a moderator in the association between child behavior problems and parental stress. The results of the present study corroborated the findings of a recent review of studies on parents of children with ID (Biswas et al., 2015). This review found that the effect-sizes for the association between child behavior problems and parental stress ranged from small to large. The variation of the effect sizes might be attributed to some moderators that affect the strength of the association. The present study shows that moderators, like parental mindfulness, can help identify when the effect of child behavior problems on parental stress is likely to make itself felt. The findings indicated that when parents had a low level of mindfulness, a high level of child behavior problems was still associated with a high level of

parental stress, whereas when parents had medium or high levels of mindfulness, a high level of behavior problems in their children was not necessarily associated with a high level of parental stress. Mindful parents did not necessarily feel stressed even when the behavior problems of their children were serious. This finding indicates that whether parents' mental well-being is adversely affected by their children's behavior problems depends on their level of mindfulness.

Parents who are more mindful, as shown in Duncan, Coatsworth, and Greenberg (2009), tend to be less judgmental and more accepting of negative feelings towards themselves and their children. They are also more aware of their present emotional states and those of their children, and less reactive to their internal processes. Because of these attributes, they may have stronger mental capacity to deal with a difficult parenting situation, e.g., caring for a child with ID and behavior problems. This may account for the lesser likelihood of their being strained by their children's behavior problems.

4.2. Contributions and Implications

The study investigated the potential moderating role of parental mindfulness in the association between child behavior problems and stress in parents of children with ID. The inclusion of teachers' reports on child behavior problems has prevented the same rater bias and ameliorated possible effects of the consistency motif (Podsakoff et al., 2003; Schmitt, 1994). The present study revealed that the mediation effect of parental mindfulness was not found

when teachers' reports were adopted. This finding indicates that the mediation model suggested by previous studies (Beer et al., 2013; Jones et al., 2014) may have resulted from parents' self-report bias. In addition, with the use of teachers' reports on child behavior problems, the present study revealed that parental mindfulness can potentially serve as an important moderator that buffers parents against the detrimental effect of their children's problem behaviors on their psychological well-being.

The results of the moderating role of mindfulness have reinforced the evidence of the utility of mindfulness-based interventions for parents of children with developmental disabilities (e.g., Bazzano et al., 2015; Cachia et al., 2016; Neece, 2014; Singh et al., 2007; Van der Oord et al., 2012). Given the prevalence of behavior problems in children with ID (Einfeld, & Tonge, 1996), the promotion of parental mindfulness could be useful support for this group of parents. Although many studies have suggested that interventions which could improve children's behavior problems could also reduce parental stress (e.g., Roberts, Mazzucchelli, Studman, & Sanders, 2006), there are also studies showing that despite a significant decrease in child behavior problems following interventions, the level of distress experienced by parents of children with developmental disabilities did not change significantly (e.g., Plant & Sanders, 2007). For the parents whose stress level is not responsive to the improvement of their children's behaviors, mindfulness could be a potential aid. As mindfulness is related to one's inner capacities for awareness and relaxation (Kabat-Zinn, 1990), a growing body of evidence

shows that it can be explicitly taught and practiced through mindfulness exercises, such as mindful breathing, stretching, and meditation practices (Bazzano et al., 2015; M. Kabat-Zinn & Kabat-Zinn, 1997; Whittingham, 2014), and this may have important practical implications for parents. For instance, parents can learn to increase their acceptance of their children as they are and be more aware of their negative emotions toward their children at the moment. Therefore, parents' own level of mindfulness can potentially help increase their mental capacity to manage difficult situations that cannot be easily changed, which in turn may buffer them against the negative effects they may have on their psychological well-being. Instead of being passively affected by the problems presented by their children, parents may have an active role in alleviating their mental health problems through a continuous practice of mindfulness.

4.3. Limitations and Future Directions

Despite its contributions to the existing body of knowledge and its implications on services for parents of children with ID, the present study has some obvious limitations. First, the study design was cross-sectional and correlational, and causality therefore cannot be discerned from the data. It is not clear whether parents who experience less stress have a greater tendency to be more mindful or higher levels of parental mindfulness lead to lower stress among parents. The latter possibility was tested in some mindfulness-based intervention studies (e.g., Van der Oord et al., 2012), but more randomized controlled trials are needed to further test its efficacy in improving parental stress. In addition, longitudinal studies are

required to determine the temporal order of the two variables. Second, the present study measured mindfulness as a general variable. However, mindfulness is a multifaceted construct that incorporates various specific components, such as acceptance and nonreactivity (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The definition of mindfulness and how best to measure it is still under debate (Leary & Tate, 2007), so it is not certain how the underlying facets of mindfulness exert their influence on parental outcomes. Further research is needed to identify whether specific constructs of mindfulness, such as acceptance, which have been suggested to act as a mediator (e.g., MacDonald, Hastings, & Fitzsimons, 2010; Weiss, Cappadocia, MacMullin, Viecili, & Lunsky, 2012), may instead function as a moderator in the association between child behavior problems and parental stress.

Third, given that the majority of participants in the present study were mothers, results may not be generalized to fathers or other caregivers. Previous studies have suggested that different psychological mechanisms are characteristic for mothers and fathers (e.g., Jones, Totsika, Hastings, & Petalas, 2013), so further research is needed to examine whether mindfulness may also moderate the effect of child behavior problems on paternal stress. Fourth, we measured child behavior problems by teachers' and parents' reports only. As human behaviors vary across settings, child behavior problems may be different across home, school, and community. The design of the present study would have been strengthened if we could compare the reports across multiple caregivers and service providers of the same child. For

example, the report from Applied Behavior Analysis Therapists as in-home service providers would be helpful.

Fifth, verbal abilities of the children may have impact on behavior problem and parental stress. Future studies will be strengthened if these abilities are included in the purview of investigation. Last but not the least, the present study was conducted in Hong Kong and the generalizability of the results may be limited to the local context. Previous cross-cultural research has found that Australian children with ASD and ID displayed more challenging behaviors to adults than Chinse children with ASD and ID (Chiang, 2008). Replication is needed to test whether mindfulness functions as a moderator in the association between child behavior problems and parental stress in parents from a Western culture.

5. Conclusion

The current study reveals that parental mindfulness acts as a moderator of the association between child behavior problems and stress in parents of children with ID. The mediation effect of mindfulness suggested by previous studies may be the result of parents' self-report bias. Teachers' reports on children's behavior provide an alternative measure to examine the potentially moderating role of mindfulness on such an association. The findings provide the encouraging message that parenting a child with ID and behavior problems does not necessarily mean more stress among all parents. Parents with high levels of mindfulness may experience less stress than those with low levels of mindfulness. This suggests that

mindfulness can buffer the adverse effects of child behavior problems on parental stress. Future parenting interventions should consider incorporating mindfulness to support parents of children with ID.

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Conflict of interest

The authors declare no actual or potential conflicts of interest that influenced the conduct of the study or the contents of the manuscript.

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Table 1

Descriptive Statistics and Correlations of the Variables

Variables	Mean (SD)	1	2	3	4
1. Parent-reported Child Behavior Problems	1.95 (0.81)	__			
2. Teacher-reported Child Behavior Problems	1.99 (0.93)	.39**	__		
3. Parental Mindfulness	3.37 (0.56)	-.16**	.07	__	
4. Parental Stress	2.89 (0.59)	.32**	.07	-.48**	__

** $p < .01$.

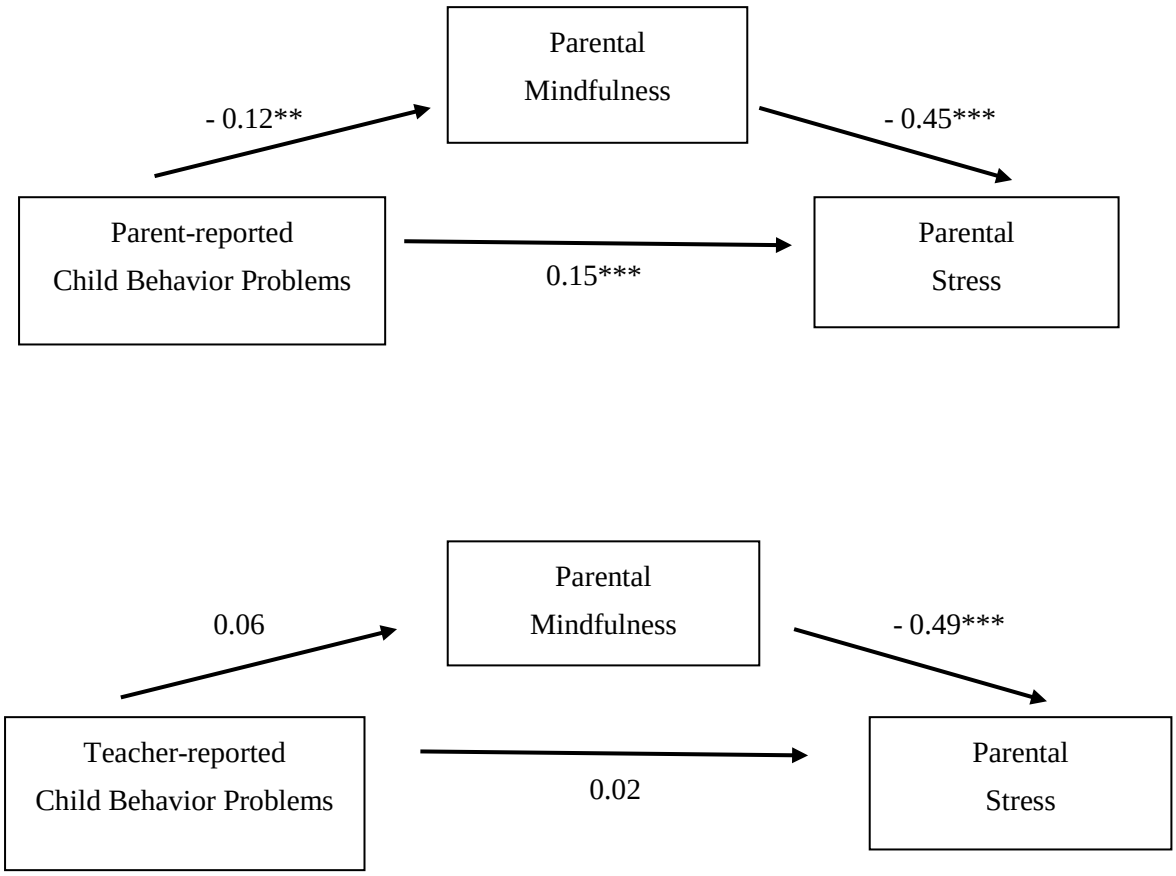

Figure 1. Two mediation models with child behavior problems as the independent variable, mindfulness as the mediator, and parental stress as the outcome variable. ** $p < .01$. *** $p < .001$.

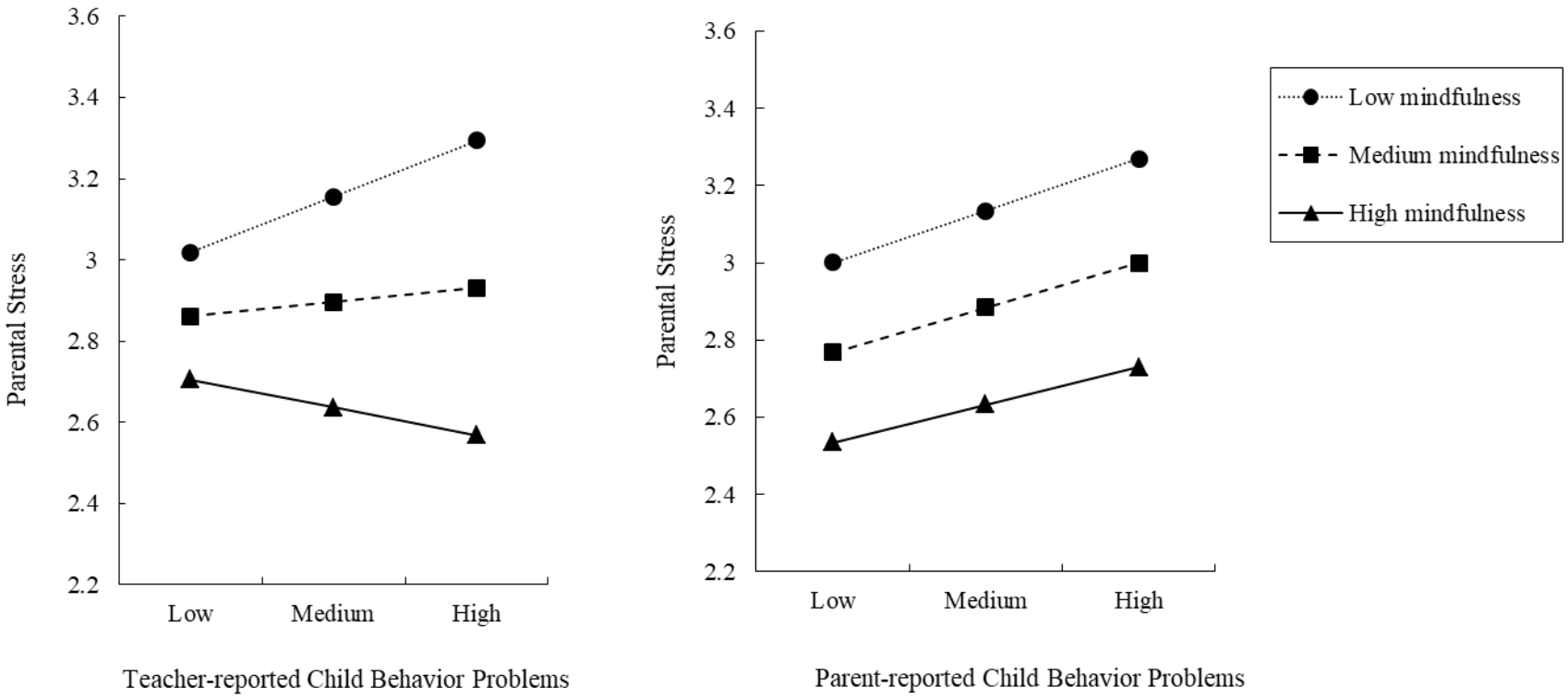

Figure 2. Two moderation models with child behavior problems and parental stress at different levels of parental mindfulness. The low level is 1 SD below the mean, the medium level is at the mean, and the high level is 1 SD above the mean.