Mindfulness (2019) 10:2352–2362
https://doi.org/10.1007/s12671-019-01208-5

ORIGINAL PAPER

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

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Published online: 9 August 2019

Abstract

Objectives The present study aimed to elucidate the mediating vs. moderating role of parenting stress between parents' characteristics, including parents' disposition to mindful parenting, affiliate stigma, and mental well-being, and the behavioral adjustment of children with autism spectrum disorder (ASD).

Methods A total of 136 Chinese parents of children with ASD under 18 years of age participated in this cross-sectional study.

Results Mediation findings showed that parenting stress mediated the relation between parents' characteristics (i.e., parents' disposition to mindful parenting and affiliated stigma) and behavioral difficulties in children with ASD. While parents' mental well-being did not explain the variability of parenting stress, parenting stress undermined mental well-being. Parents' mental well-being was also related to children's prosocial behaviors. However, their mental well-being did not mediate between parenting stress and children's prosocial behaviors. Competing test of parenting stress as a moderator did not yield significant findings.

Conclusions These findings inform applied intervention efforts to promote parents' mindful parenting and mental well-being as resources that generate multiple outcomes in children with ASD. Relatedly, the present research suggests the importance of combating stigma in reducing parents' stress and children's behavioral difficulties.

Keywords Affiliate stigma · Autism spectrum disorder · Child adjustment · Mental well-being · Mindful parenting · Parenting stress

Children with autism spectrum disorder (ASD) have difficulties in communication, social interactions, and restricted, repetitive, and stereotypic patterns of behaviors (American Psychiatric Association 2013). In the family setting, caregiving can be challenging for parents whose children are diagnosed with ASD. Previous studies found that these parents experience more stress and symptoms of depression and anxiety compared with parents of typically developing children and children with other disabilities (Cohrs and Leslie 2017; Dumas et al. 1991; Mak and Ho 2007; Smith et al. 2010). Extensive studies further suggested a positive relation between parental stress and children's behavioral problems (Lecavalier et al. 2006; Lounds et al. 2007). As such, understanding the mechanisms between parental processes and behavioral adjustment among children with ASD is a major research priority.

According to the model of stress in parent-child interactions (Mash and Johnston 1990), parents' characteristics are fundamental to their experiences of stress in parent-child interactions. The relation is particularly prominent in at-risk families, such as those involving children with ASD. More specifically, Mash and Johnston (1990) argued that parents' characteristics including their health status, automatic processing, emotional states, and cognitions may serve as a backdrop for parenting and parent-child interactive stress. Extending their model to families of children with ASD, parenting stress may mediate between parents' characteristics, namely mindful parenting disposition, affiliate stigma, and well-being, and children's behavioral adjustment.

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The role of mindfulness is crucial to both parents' and children's adjustment. According to Mash and Johnston (1990), parents' automatic forms of cognitive processing and preexisting cognitive structures may worsen parent-child interactions. Within the Chinese context, for instance, children are expected to be obedient and respectful to authority figures (Chen et al. 2012). It is also prevalent for parents to utilize culturally appropriate parenting practices such as "chiao shun" (i.e., to teach and to educate) and "guan" (i.e., to govern; Chao 1994). The expectations of how parenting should look like and how children should behave may engender Chinese parents' automatic forms of parenting. On the contrary, mindfulness, i.e., a mental state in which individuals pay attention on purpose, non-judgmentally, and in the present moment (Kabat-Zinn 1994), may enhance parent-child positive interactions and reduce parents' level of stress. Mindful individuals are aware of the moment-to-moment experience, including their thoughts, feelings, bodily sensations, consciousness, and the environment, such that they can disengage from automatic forms of cognitive processing and self-perpetuating patterns of ruminative negative thoughts. When parents of children with ASD are mindful of their everyday lives and their children's needs, they are more able to disengage from culture-specific practices and view their experience consciously and objectively. By focusing on the present and refraining from over-identification with subjective thoughts and feelings, parents are less preoccupied with negative biases and expectations towards their children with special needs. Mindfulness is beneficial to parents in times of stress. Importantly, mindfulness-based training can reduce parents' stress and improve parenting practice (Bögels et al. 2010), as mindful parents are less rejecting, less controlling, and less reactive in parent-child interactions. They are also more compassionate and have a better understanding about themselves during difficult moments.

Previous research indicated that dispositional mindfulness engenders mindful parenting behaviors in parents of typically developing children (Gouveia et al. 2016). According to Duncan et al. (2009), mindful parenting refers to parents in bringing moment-to-moment awareness intentionally to the parent-child relationship. Such parenting practices involve listening with full attention, communicating non-judgmental acceptance, cultivating emotional awareness, developing self-regulation to avoid automatic behaviors, and expressing compassion. In a similar vein, Dumas (2005) suggested that mindful parenting involves strategies that lessen the grip of automaticity in families with disruptive children. When parents engage in automatized patterns of thinking, feeling, and acting in parent-child interactions, their deliberate attention to the needs of the child in the present moment may be limited. Parents' disposition to mindful parenting can give rise to mindful parenting practices, such that they are more non-judgmental, more attuned to their own behaviors and their child's responses, and more able to detach themselves from subjective emotions to develop parenting goals accompanied by motivated action plans. In the Chinese context, parents also reported experiencing less stress from parent-child interactions and better family functioning (Lo et al. 2018). With a more accurate interpretation of the child's intended messages, parents are better in attending to their children's needs as well as their own concerns.

As for the parents of children with ASD, recent studies reported that mindful parenting is associated with lower parental stress, depressive symptoms, and anxiety symptoms among parents (e.g., Beer et al. 2013; Jones et al. 2014). It is also associated with reduced behavioral problems in children with ASD (Coatsworth et al. 2010; Singh et al. 2006; Singh et al. 2007; Singh et al. 2010). A systematic review of 10 studies among parents of children with ASD supported that mindfulness-based interventions have long-term positive effects in relieving stress (Cachia et al. 2016). For example, parents who attended an 8-week mindful parenting training showed less stress and better global health outcomes post-training compared with parents in the behavioral skills group (Ferraioli and Harris 2013). Likewise, parents and educators of children with special needs experienced a decrease in stress and anxiety, as well as an improvement in mindfulness upon completion of a 5-week mindfulness-based training (Benn et al. 2012). More recently, Singh et al. (2019) found that the Mindfulness-Based Positive Behaviour Support training program reduced the stress experienced by parents of adolescents with intellectual disability and ASD, as well as adolescents' aggression and disruptive behavior. In addition, the program increased adolescents' compliance over the 40-week follow-up. While intervention studies supported the benefits of mindfulness-based parenting training, scholars have called for research to investigate the mechanisms through which parents' mindfulness can enhance children's mental health (Bögels et al. 2010; Dumas 2005; Duncan et al. 2009).

In addition to mindful parenting, in their model, Mash and Johnston (1990) postulated that parents' cognitive structures, such as attitudes and beliefs, can influence parent-child interactions and parents' experience of stress. These attitudes and beliefs may include specific child-rearing values, beliefs, and standards for appropriate child behavior, and in the case of parents with children with ASD, their stigmatized attitudes and beliefs about ASD. Parents of children with ASD are often subject to stigma by the general public (Gray 1993) given the disruptive nature of ASD symptoms and the public's limited understanding about ASD. For example, the public may attribute children's display of ASD symptoms as parents' incompetence in adequate parenting and behavioral discipline (Penn et al. 2000). Parents may also be teased, shamed upon, blamed, or deemed responsible for their children's diagnosis (Larson and Corrigan 2008). When parents internalize stigma from the public, affiliate stigma develops, by which the

parents negatively evaluate themselves as socially undesirable (Corrigan and Shapiro 2010; Mak and Cheung 2008; Mak and Kwok 2010).

Affiliate stigma refers to the extent to which the associates of children with ASD, such as parents and families, internalize the stigma from the general public (Mak and Cheung 2012). For example, parents may believe that they are inferior to others, incompetent, and withdraw from others in order to conceal their status. Previous research indicated that affiliate stigma is negatively associated with parental well-being and caregiving behaviors. Importantly, studies found that parents' affiliate stigma was negatively related to parents' mental well-being (Green 2003; Mak and Cheung 2012; Mak and Kwok 2010) and positively related to children's behavioral problems (Gray 1993, 2002). Compared with Western societies, affiliate stigma may be particularly salient in the Chinese contexts, given the latter's interdependent orientation and cultural values, such as face concern. Face concern (*mianzi*) refers to individuals' desire to maintain and preserve their social worth and image within the interpersonal context (Hwang 1998). In order to avoid family disgrace and face loss (Mak and Chen 2006, 2010; Ow and Katz 1999; Sue and Sue 1987), parents may keep their children's condition as a family secret. Previous findings suggested that affiliate stigma mediated the relationship between face concern and caregivers' outcomes including their distress and subjective burden (Mak and Cheung 2012). In the context of families of children with ASD, parents' affiliate stigma was found to be associated with psychological distress (Wong et al. 2016). Consequently, the prevailing stigma commonly internalized by parents may give rise to parenting stress and difficulties that further undermine child adjustment.

Returning to Mash and Johnston's (1990) model of stress, parents' emotional and health status serve as a third direct determinant of stress in parent-child interactions, in addition to other characteristics such as mindful parenting and affiliate stigma. Indeed, a plethora of evidence has indicated that parents' mental well-being is crucial to parenting stress, parenting behaviors, and behavioral adjustment of children with ASD (e.g., Davis and Carter 2008; Jones et al. 2014; Totsika et al. 2013). In the face of a child with ASD, parents typically experience heightened depressive symptoms, anxiety, and stress (Abbeduto et al. 2004; Cohrs and Leslie 2017; Dumas et al. 1991; Lai et al. 2015; Smith et al. 2010). As discussed earlier, the stigma experienced by Chinese parents of children with ASD is particularly prominent and is associated their dampened psychological well-being (Chan and Lam 2018; Mak and Kwok 2010).

Interestingly, previous research primarily investigated the effect of children's ASD symptoms on parents' mood and well-being (e.g., Jones et al. 2014; Lounds et al. 2007; Pottie et al. 2008; see also "Child Characteristics" in the model of stress in parent-child interactions; Mash and Johnston 1990). However, a recent longitudinal study evidenced that the relation between parents' well-being and children's behavioral problems was bidirectional, such that children and parents reciprocally influenced each other over time (Totsika et al. 2013). That is, parents' well-being also can undermine the behavioral adjustment of children facing ASD. To further complicate the process, Hammen and colleagues demonstrated that parents' mental well-being and stress are bidirectionally related (e.g., Hammen 2005). Specifically, parents' psychological distress and depressive symptoms are stress-generating. Stressful experiences also contribute to worse mental well-being by giving rise to depressive symptoms (Hammen 2015; Hammen et al. 2012). Based on these findings, parents' mental well-being, stress, and children's behavioral adjustment are closely intertwined.

Drawing from a model of stress in parent-child interactions (Mash and Johnston 1990), we examined the relation between three parent characteristics in the context of ASD, parenting stress, and children's behavioral outcomes (Fig. 1). Specifically, parents' disposition to mindful parenting and

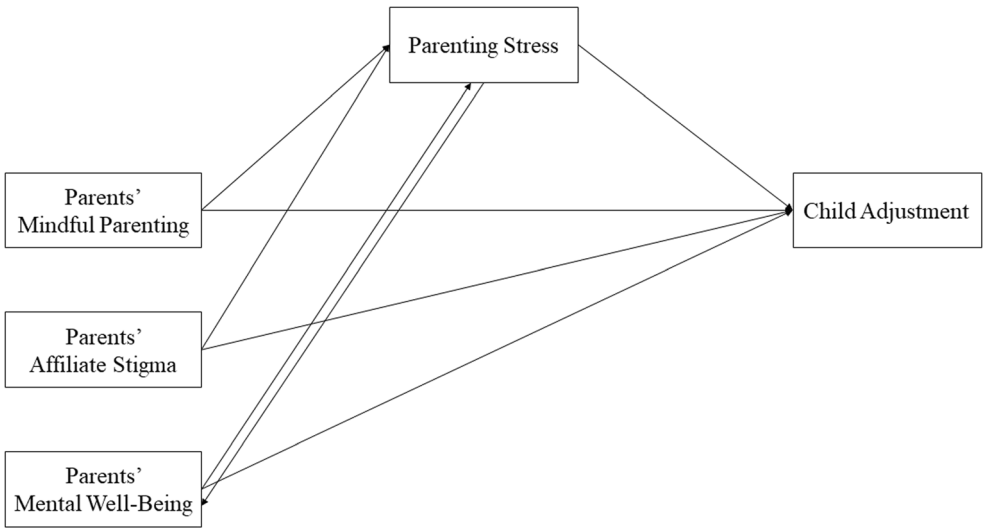

Fig. 1 Conceptual model of parenting stress as a mediator between parents' characteristics and child adjustment

mental well-being were hypothesized to potentiate less parenting stress. In return, parenting stress was hypothesized to elevate worse mental well-being. Parents' affiliate stigma was hypothesized to elevate parenting stress. Altogether, parenting stress was hypothesized to mediate between parents' characteristics and the behavioral outcomes of children with ASD. Unique to this study was a rigorous test of competing hypotheses, with parenting stress as a mediator vs. a moderator between multiple parents' characteristics and children's outcomes, given that a high level of stress may curtail, or moderate, the positive role of parents' mental well-being on child adjustment. It may also exacerbate the negative relation between affiliate stigma and child adjustment. Indeed, previous research documented that parents' stress and psychological resilience interacted to predict their own anxiety and depression (Bitsika et al. 2013). Ultimately, the goal of this study was to elucidate between parent characteristics, parenting stress, and children's behavioral adjustment in the context of ASD.

Method

Participants

There was a total of 142 Chinese parents of children with ASD under 18 years old. Among these participants, six parents whose children were diagnosed with comorbid disorders including attention deficit/hyperactivity disorder and dyslexia were excluded from this study. The final sample for analysis included 136 parents.

Participants were on average 43.09 years of age (*SD* = 6.62). A majority of the participants were mothers (*n* = 111; 81.62%), married (*n* = 122; 89.71%), and had secondary school education or above (*n* = 117; 86.03%). More than half were working (*n* = 61, 44.85% full-time; *n* = 16, 11.76% part-time) and the median monthly household income reported by the parents was between HK$30,001 and $40,000 (approximately US$3856–$5141). Compared with the most updated median monthly household income in Hong Kong (Census and Statistics Department 2018) at HK$27,500 (approximately US$3535), the income of the participating parents was slightly higher.

Children had a mean age of 9.39 years (*SD* = 5.24), with 111 boys (81.62%) and 25 girls (18.38%). Approximately 8.27% (*n* = 11) were toddlers receiving early education training, 22.56% (*n* = 30) were studying in preschools, 33.08% (*n* = 44) were studying in primary schools, and 36.09% (*n* = 48) were studying in secondary schools. All of the children were diagnosed with ASD or Asperger's syndrome, with 33.82% (*n* = 46) reported intellectual disability (10.45% borderline, 17.16% mild, 5.22% moderate, .75% severe, .75% gifted). No significant differences were found between parents' gender on the variables in the model (*p*s > .05). No significant differences were found between children's gender, children's age, and parents' age on the variables in the path model.

Procedures

This study was approved by the Survey and Behavioral Research Ethics Committee of the corresponding author's university prior to its implementation. Parents of children diagnosed with ASD were recruited through non-governmental organizations (NGOs), special schools, and inclusive education settings in Hong Kong. Informed consent was obtained from parents prior to the beginning of the study. Parents were asked to complete a packet of questionnaire on a voluntary basis in a quiet room. Completed questionnaires were, then, collected by a trained research assistant.

Measures

A Chinese version of the following measures was used. As the Chinese version of parents' disposition to mindful parenting was not available in the literature, it was translated from English to Chinese via the back-translation procedures (Brislin 1970) by the second author and a trained research assistant independently. Discrepancies were discussed and resolved among the authors and the research assistant.

Parents' Disposition to Mindful Parenting The 15-item Bangor Mindful Parenting Scale (BMPS; Jones et al. 2014) was used to measure parents' disposition to mindful parenting practices. Participants rated the items on a 4-point Likert scale ranging from 1 (*never true*) to 4 (*always true*). Example items included "I tend to make judgments about whether I am being a good or a bad parent" and "When I have upsetting thoughts about my child, I am able to just notice them and let them go." Consistent with the original authors of the BMPS (Jones et al. 2014), in this study, we used a total BMPS score to represent a general tendency for parents to be mindful in the context of parenting. The internal consistency based on the present data was acceptable, with Cronbach's alpha = .64.

Parents' Affiliate Stigma Affiliate Stigma Scale was originally developed and validated in Chinese and comprised of 22 items that assessed the extent of internalized stigma among parents of children with autism (Mak and Cheung 2008). Items were rated on a 4-point Likert scale from "strongly disagree" to "strongly agree." It had affective, cognitive, and behavioral components. Example items are "I feel helpless for having a family member with ASD" (affective); "My reputation is damaged because I have a child with ASD" (cognitive); and "I dare not to tell others that I have a child with ASD" (behavioral). Previous research demonstrated excellent internal consistency in samples of Chinese parents of children with autism as well as Chinese caregivers of people with mental illness

(Mak and Kwok 2010; Mak and Cheung 2012). In this study, internal consistency was good with Cronbach's alpha = .95.

Parents' Mental Well-being The 14-item Mental Health Continuum-Short Form (MHC-SF; Keyes 2002) was used to measure emotional, psychological, and social well-being. Participants were asked to rate the frequency during the past month when they felt in a certain way, for example, "interested in life," "that you had warm and trusting relationships with others," and "that your life had a sense of direction and meaning to it." Responses were indicated on a 6-point scale, ranging from 0 (*Never*) to 5 (*Every day*). This scale had been validated and had excellent reliability across a wide range of samples (Keyes 2006a, 2006b; Keyes et al. 2008; Westerhof and Keyes 2010). The MHC-SF also yielded support for reliability and validity in a sample of Chinese adolescents (Guo et al. 2015). In this study, the internal consistency was good with Cronbach's alpha = .90.

Parenting Stress The Parenting Stress Scale (Berry and Jones 1995) consisted of 18 items assessing parental feelings and experiences in terms of rewards, satisfaction, controllability, and stress. Participants rated the items on a 6-point Likert scale ranging from 1 (*strongly agree*) to 6 (*strongly disagree*). Example items included, "I enjoy spending time with my child," "I feel overwhelmed by the responsibility of being a parent," and "Having children leaves little time and flexibility in my life." The PSS was reported to have satisfactory construct validity and stability among both fathers and mothers as well as parents of children with and without clinical problems (Berry and Jones 1995). The Chinese version of PSS (with two item deleted from the original scale due to low item-total correlation) was used in this study (Leung and Tsang 2010). In our sample, internal consistency was satisfactory with Cronbach's alpha = .87.

Children's Behavioral Problems and Prosocial Behaviors The 25-item Strengths and Difficulties Questionnaire (SDQ; Goodman 1997) was used to measure behavioral problems and prosocial behaviors. Participants were asked on a 3-point scale how much they agreed the items described their children ranging from 0 (*not true*) to 2 (*certainly true*). Example items included, "nervous or clingy in new situations" (emotional problems); "easily distracted, concentration wanders" (hyperactivity); "often fights with other children" (conduct problems); "picked on or bullied" (peer problems); and "shares readily with other children" (prosocial behaviors). Item scores were averaged, with higher scores indicating more behavioral problems and prosocial behaviors, respectively. Previous research demonstrated adequate reliability and validity in Chinese community and clinical samples (Lai et al. 2010). It has also been used in a recent study conducted with adolescents from multiple Chinese contexts (Cheung et al. 2018). The internal consistency of SDQ in this sample was acceptable, with Cronbach's alpha = .71 for behavioral problems and .67 for prosocial behaviors.

Data Analyses

Correlations, means, and standard deviations were conducted as preliminary analyses for the variables under study. Path analyses were used to test the competing mediation vs. moderation hypotheses via MPLUS, Version 7 (Muthén and Muthén 2012). In the mediation model, parents' characteristics including disposition to mindful parenting, affiliate stigma, and mental well-being were entered to explain the variability of parenting stress. Parenting stress was also entered to explain the variability of parents' well-being to examine the bidirectional effects between parenting stress and mental well-being. All of the above variables were entered to explain the variability of child adjustment, including children's behavioral difficulties and prosocial behaviors. Bootstrapping was used to evaluate the mediation effects, as it could yield more accurate estimates of the indirect effect standard errors than other approaches to testing mediation (Shrout and Bolger 2002).

To test the moderation model, the variables were centered prior to analysis. Next, the main effects of parents' characteristics (i.e., disposition to mindful parenting, affiliate stigma, and mental well-being) and parenting stress were entered to explain the variability of children's behavioral difficulties and prosocial behaviors. The two-way interaction effects were investigated by multiplying between parents' characteristics and parenting stress and entered to the same model.

In both models, maximum likelihood method was used to investigate the model fit to the observed matrices of variance and covariance. Full information maximum likelihood estimation was used to handle any missing data. Parents' and children's age and gender were added as control variables for parenting stress and children's outcomes.

Results

Table 1 shows the correlations, means, and standard deviations of the variables involved in the path model.

Mediation Analysis

The purported cross-sectional mediation model fit to the data adequately, $\chi^2(5) = 5.26$, $p > .05$, CFI = .99, TLI = .99, RMSEA = .02, SRMR = .02 (see Table 2 for details). Parents' disposition to mindful parenting was negatively associated with parenting stress ($\beta = -.45$, $p < .001$). Parents' affiliate stigma was positively associated with parenting stress

Table 1 Zero-order correlations, means, and *SD*s of the study variables ($N = 136$)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Children's gender	–									
(2) Children's age	− .10	–								
(3) Parents' gender	.02	.15	–							
(4) Parents' age	− .02	.70***	− .08	–						
(5) Parents' affiliate stigma	− .06	.09	− .02	.05	–					
(6) Parents' mental well-being	.06	.10	.08	.01	− .41***	–				
(7) Disposition to mindful parenting	.16	.06	.10	.06	− .46***	.47***	–			
(8) Parenting stress	.04	.00	− .07	.07	.60***	− .59***	− .53***	–		
(9) Children's behavioral difficulties	.05	.06	− .04	.00	.33***	− .31***	− .38***	.44***	–	
(10) Children's prosocial behavior	.00	.24**	.06	.25**	− .15	.27***	.18*	− .19*	− .05	–
M	–	9.39	–	43.09	2.02	3.77	1.73	3.11	.77	.96
SD	–	5.24	–	6.62	.52	.91	.31	.67	.28	.43

*$p < .05$; **$p < .01$; ***$p < .001$

($\beta = .53$, $p < .001$). While parents' mental well-being did not explain the variability of parenting stress ($\beta = .30$, $p < .05$), parenting stress significantly explained the variability of parents' mental well-being ($\beta = -.76$, $p < .001$) and children's behavioral problems ($\beta = .27$, $p < .05$). Parents' well-being was also positively associated with children's prosocial behaviors ($\beta = .22$, $p < .05$). Children's and parents' age and gender were not associated with the variables under study.

Based on these findings, the indirect effect between parents' disposition to mindful parenting and children's behavioral problems via parenting stress was $\beta = -.11$ and $p < .05$. The indirect effect between parents' affiliate stigma and children's behavioral problems via parenting stress was $\beta = .12$ and $p = .01$. The indirect effect between parenting stress and children's prosocial behaviors via parents' mental well-being was $\beta = -.13$ and $p > .05$. To further verify potential indirect effects, bootstrapping was conducted. Using the current data, the 95% bootstrap confidence interval (BCI) based on 1000 bootstrap samples with replacement indicated that the indirect effect between parents' disposition to mindful parenting and children's behavioral problems via parenting stress did not include a 0 (95% BCI (− .20, − .04)). The 95% BCI based on 1000 bootstrap samples with replacement indicated that the indirect effect between parents' affiliate stigma and children's behavioral problems via parenting stress also did not include a 0 (95% BCI (.03, .13)). Finally, the 95% BCI based on 1000 bootstrap samples with replacement indicated that the indirect effect between parenting stress and children's prosocial behaviors via parents' mental well-being did include a 0 (95% BCI (− .18, .01)). These findings suggested parenting stress as a mediator between parents' characteristics (i.e., disposition to mindful parenting and parents' affiliate stigma) and children's behavioral problems.

Moderation Analysis

The saturated moderation model indicated that parents' characteristics (i.e., disposition to mindful parenting, affiliate stigma, and mental well-being) and parenting stress did not interactively explain the variability of children's behavioral difficulties and prosocial behaviors. As such, the present findings did not support the moderation model.

Discussion

Guided by a model of stress in parent-child interactions (Mash and Johnston 1990), the present findings shed light on the mediating role of parenting stress between parents' characteristics and adjustment outcomes among children with ASD. The hypothesized model was partially supported, in that parenting stress mediated between parents' characteristics (i.e., mindful parenting disposition and affiliate stigma) and children's behavioral difficulties. Specifically, parents' greater disposition to mindful parenting and lower affiliate stigma were associated with lower parenting stress which, in turn, was associated with children's fewer behavioral difficulties. Interestingly, while parents' mental well-being did not explain the variability of parenting stress, parenting stress significantly explained the variability of parents' mental well-being. Moreover, parents' well-being emerged as the only correlate of children's prosocial behaviors in the path model. A competing hypothesis with parenting stress as a moderator (vs. a mediator) did not yield significant findings. Consistent with the developmental psychopathology perspective (Cicchetti and Rogosch 1996), these findings demonstrated multifinality, in that parental processes were linked to multiple aspects of adjustment among Chinese children with ASD.

The present findings were consistent with the idea that mindfulness enhances unbiased attention in the present moment and open acceptance of feelings and thoughts (Cheung and Ng 2019; Kabat-Zinn 1994). Through mindfulness, parents may be better in distancing themselves from automatic forms of indigenous parenting, such as "guan" (Chao 1994; see also Mash and Johnston 1990). Despite the potential challenges in caregiving children with ASD, parents who were more dispositionally mindful in parenting were less judgmental, more attentive, more regulated during parent-child interactions, and more accepting of the self and their child's behaviors and ASD condition (see also Gouveia et al. 2016). Consistent with a recent study conducted with a Chinese community sample (Lo et al. 2018), these findings demonstrated an inverse relation between mindful parenting disposition and parenting stress. As mindful parents reduce their automaticity in parent-child interactions driven by preconceptions (Dumas 2005), they were more able to attune sensitively and responsively to stressful parent-child situations, thereby alleviating their levels of parenting stress.

Table 2 Unstandardized parameter estimates, standard errors, and 90% confidence intervals of the path model

Parameters	Unstandardized estimates (SEs)	95% confidence intervals
Parents' mindful parenting		
➔Parenting stress	− .98 (.23)***	− 1.48, − .56
➔Children's behavioral problems	− .18 (.09)*	.02, .20
➔Children's prosocial behaviors	.01 (.14)	− .28, .31
Parents' affiliate stigma		
➔Parenting stress	.69 (.12)***	.47, .96
➔Children's behavioral problems	.04 (.05)	− .07, .14
➔Children's prosocial behaviors	− .05 (.09)	− .22, .13
Parents' mental well-being		
➔Parenting stress	.22 (.12)	.01, .48
➔Children's behavioral problems	− .01 (.03)	− .07, .05
➔Children's prosocial behaviors	.11 (.05)*	.01, .21
Parenting stress		
➔Parents' mental well-being	− 1.02 (.15)***	− 1.30, − .75
➔Children's behavioral problems	.11 (.05)*	.02, .20
➔Children's prosocial behaviors	− .03 (.08)	− .16, .14
Children's age		
➔Parenting stress	− .02 (.02)	− .05, .01
➔Children's behavioral problems	.00 (.01)	− .01, .02
➔Children's prosocial behaviors	.01 (.01)	− .02, .02
Children's gender		
➔Parenting stress	.19 (.13)	− .05, .44
➔Children's behavioral problems	.07 (.06)	− .09, .19
➔Children's prosocial behaviors	.00 (.09)	− .19, .20
Parents' age		
➔Parenting stress	.02 (.01)	− .003, .04
➔Children's behavioral problems	.00 (.01)	− .01, .01
➔Children's prosocial behaviors	.01 (.01)	− .002, .03
Parents' gender		
➔Parenting stress	− .02 (.14)	− .30, .29
➔Children's behavioral problems	− .02 (.06)	− .13, .10
➔Children's prosocial behaviors	.06 (.10)	− .16, .25
Error covariance		
Children's behavioral problems ⟷ prosocial behaviors	.01 (.01)	− .01, .02

*$p < .05$; **$p < .01$; ***$p < .001$

The present findings corroborated previous research conducted in Hong Kong, which showed that affiliate stigma was associated with greater distress among caregivers of Chinese children with developmental disabilities (Mak and Cheung 2012; Mak and Kwok 2010). More specifically, parents who experienced affiliate stigma were more likely to report a greater level of parenting stress. In contrast, with a lower level of affiliate stigma, parents might find parenting a source of satisfaction despite their children's ASD symptoms (Duncan et al. 2009). These parents might be less prone to potential worries and less likely to overwhelm themselves by creating stressful parenting demands, such as making unrealistic attempts to eliminate or conceal their child's ASD symptoms, in order to not be stigmatized by others.

Extending the model of stress in parent-child interactions (Mash and Johnston 1990), parenting stress mediated the relation between parents' characteristics (i.e., mindful parenting disposition and affiliate stigma) and children's behavioral difficulties. From a process-oriented perspective, parenting stress served as a mechanism between parents' specific characteristics in predicting children's maladjusted behaviors. Interestingly, although parents' mental well-being only marginally explained the variability of parenting stress, parenting stress significantly explained the variability of parents' mental well-being. That is, greater parenting stress gave rise to parents' dampened well-being. These findings were consistent with previous research indicating that parents' stress worsened the well-being of caregivers of children with developmental disabilities (Brehaut et al. 2004; Skok et al. 2006). Future longitudinal and experimental studies are necessary to identify the directionality and causal effect between parenting stress and parents' well-being.

Surprisingly, parents' mental well-being was the only exogenous variable in the path model associated with children's prosocial behaviors. Although zero-order correlations indicated that other variables such as parents' and children's age were significantly associated with children's prosocial behaviors, the association did not bear out when other parents' variables were included in the path model. Simply put, based on the simple correlations, prosocial behaviors increased with parents' and children's age. With an increasing child age, children demonstrated increasing social competence, altruistic behaviors, and understanding about the theory-of-mind (Walker

2005). However, parents' mental well-being emerged as a more important correlate of children's prosocial behaviors than was age in a comprehensive path model. Consistent with findings that suggest a link between well-being and prosocial behaviors (Aknin et al. 2013; Dunn et al. 2008), we speculate that parents who reported better well-being were more likely to engage in prosocial behaviors. Simultaneously, children whose parents demonstrated more prosocial behaviors might be more likely to engage in prosocial behaviors themselves (see social learning theory; Bandura 1977). Future studies are necessary to verify whether parents' prosocial behaviors serve as a mediating variable between parents' mental well-being and children's prosocial behaviors.

Limitations and Future Directions

The current findings must be interpreted in light of several limitations. Causal inferences could not be made from the present study. Experimental design will enable us to draw causal relations among the study variables. Moreover, a longitudinal study is necessary to identify the temporal sequence of the variables, as cross-sectional analyses of mediation are theoretically and statistically biased (Cole and Maxwell 2003; Maxwell and Cole 2007). The study relied on parents' questionnaire data. Future studies should utilize multiple reporters and multiple methods of assessment to minimize potential biases related to self-report and common method of measurement. Also, it is important to mention that this study consisted primarily of mothers. Given previous research indicated unique mother-father, mother-child, and father-child dynamics (e.g., Cheung et al. 2016) particularly in the Chinese context (Lin et al. 2019), future research should evaluate the present model as a function of gender. It is noted that the internal consistency of mindful parenting and children's prosocial behavior measures was lower than the desired range, with Cronbach's alpha = .64 and .67, respectively. As such, findings must be interpreted with caution. Although the SDQ (Goodman 1997) was validated previously in both community and clinical samples among parents of Chinese children Hong Kong, further validation is necessary in samples of children with ASD and their parents. Similarly, a validation of the BMPS (Jones et al. 2014) is necessary to ensure that the mindful parenting measure is appropriate for use in diverse Chinese contexts. Nevertheless, although the BMPS (Jones et al. 2014) could adequately assess mindful parenting disposition, it was unable to assess mindful parenting practices. Future work is necessary to examine both the disposition and the practice of mindful parenting to more fully understand parental processes associated with child development. Next, given that stigma may mediate between cultural values such as face concern and parents' distress (Mak and Cheung 2012), and that indigenous parenting practices such as "guan" may mediate between mindful parenting disposition and stress, future work should identify culture-specific third variables to increase model specificity. Finally, our study used a convenient sample of voluntary participants recruited mostly via NGOs (78% from NGOs and 22% from schools). It was possible that parents who participated in NGO services received more support and resources than those who did not. Future studies should attempt to collect data via diverse settings, including a range of local schools and special education centers, to ensure the sample is representative in a given context. Notwithstanding the above limitations, the present study contributed to the literature by identifying the relation between parents' characteristics, parenting stress, and adjustment of Chinese children with ASD.

Author Contributions RYMC: collaborated with the design of the study, conducted the data analyses, and wrote the manuscript. SSWL: collaborated with the design and writing of the study, executed the study, and edited the manuscript. WWSM: collaborated with the design of the study and the writing and editing of the final manuscript.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethics Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the Human Research Ethics Committee of The Chinese University of Hong Kong.

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

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