



Linking Child Autism to Parental Depression and Anxiety: The Mediating Roles of Enacted and Felt Stigma

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Abstract

This study examined whether child autistic symptoms would heighten parental affective symptoms through evoking enacted stigma from the community (i.e., public and courtesy stigma) and felt stigma within the parents (i.e., vicarious and self-stigma). Cross-sectional questionnaire data were collected from 441 parents of children with autism spectrum disorder. Path analyses showed that social communication and interaction deficits and restricted and repetitive behaviors in child autism were positively associated with public and courtesy stigma. While public stigma was positively associated with parental vicarious stigma, courtesy stigma was positively associated with parental self-stigma. Both vicarious and self-stigma were positively associated with depressive and anxiety symptoms among parents. Findings revealed how child autism could compromise parental well-being through exacerbating the family's stigmatizing experiences.

Keywords Child autistic symptoms · Public stigma · Courtesy stigma · Vicarious stigma · Self-stigma · Parental affective symptoms

Parents of children with autism spectrum disorder (ASD) are often highly stressed owing to different challenges they encounter in caregiving (Hayes and Watson 2013). They need to not only manage the autistic symptoms of their children but also cope with the community stigma directed against their children and themselves (Chan and Lam 2016, 2017, 2018). Indeed, the societal discrimination perceived and experienced by these parents may pose substantial psychological burden to them and increase their risks for emotional problems (Chan and Lam 2017; Gray 2002; Kinnear et al. 2016). The goal of this study was to develop an integrated model that elucidates how child autistic symptoms may heighten parental affective symptoms through evoking *enacted* stigma from the public and *felt* stigma within the parents.

Child Autistic Symptoms and Parental Affective Symptoms

Children with ASD may exhibit persistent deficits in social communication and social interaction as well as restricted and repetitive patterns of behavior (American Psychiatric Association 2013). These autistic symptoms are likely to increase the childcare demands, caregiving challenges, and parenting stress for parents of children with ASD (Estes et al. 2013; Firth and Dryer 2013; McStay et al. 2014). The potential cumulative effects are diminutions in psychological well-being and life satisfaction along with exacerbations of negative mood and emotional distress among these parents (Neff and Faso 2015; Padden and James 2017). Notably, a meta-analysis found that, compared to parents of typically developing children and parents of children with other developmental disabilities, parents of children with ASD reported more psychopathological symptoms, including depression and anxiety (Yirmiya and Shaked 2005).

Research underscores consistent positive associations between child autistic symptoms and parental affective symptoms (Chan et al. 2018a). However, the potential mechanisms underlying these associations have yet to be explored and examined. One plausible mechanism by which child autism symptomatology affects parental mental health

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is through the societal stigma against the children and their parents (Chan and Lam 2017, 2018). When children with ASD display social deficits and behavioral problems, they may be disapproved and discriminated by the public (Wong et al. 2016). Due to biological and relational closeness to these children, parents of children with ASD may also be unreasonably criticized and blamed for causing the deficits and problems through passing on bad genes and failing to provide effective parenting (Mak and Kwok 2010). Perceiving and experiencing such negative reactions from the public may, in turn, inflict psychological pain on these parents and compromise their mental health (Papadopoulos et al. 2019).

Mediating Roles of Public Stigma and Parental Vicarious Stigma

Public stigma refers to stereotypical beliefs, prejudicial attitudes, and discriminatory behaviors endorsed by the general population toward individuals with a discredited attribute (Corrigan and Watson 2002). Research shows that the public stigma of ASD is prevalent in different cultural contexts (World Health Organization 2019). Due to the lack of visible physical markers of ASD, when children with the disorder display social deficits and behavioral problems, they are often regarded as being willfully defiant, disruptive, and uncooperative (Gray 1993; Ling et al. 2010). These children may be avoided, neglected, and excluded from social activities by their peers (Kinnear et al. 2016). They may also be verbally and physically bullied by other children (Capadocia et al. 2012). Such discriminatory experiences usually leave children with ASD feeling degraded, shamed, and ostracized (Schroeder et al. 2014).

According to a family system perspective, the psychological experiences of children with ASD and their parents are interconnected and interdependent (Morgan 1988). In this regard, the public stigma of ASD may harm not only the children, but also the parents (Chan and Lam 2017). In fact, many parents of children with ASD are aware of their children's negative social experiences and may be subjected to what Corrigan and Miller (2004) defined as vicarious stigma: the psychological pain experienced by family members when they realize the detrimental impact of stigma on their relatives. Previous studies have shown that parents of children with ASD may feel despondent when learning the public's devaluation and discrimination against their children (Gray 2002; Green 2003). These parents may also be apprehensive about the potential adverse effects of stigma on their children's life opportunities and future developments (Gray 1993).

Vicarious stigma may have a damaging impact on the mental health of parents of children with ASD (Gray 2002). As observing a loved one in distress may activate empathy,

parents of children with ASD may develop a sense of sympathy and compassion for their children being under stigma stress (Corrigan and Miller 2004). These parents may also suffer unpleasant feelings of sadness and worry in response to their children's social pain (Eaton et al. 2016). Because of these negative emotional responses, the parents may experience heightened psychological distress and negative affect (Eaton et al. 2016). To date, studies have corroborated such views by showing vicarious stigma as a risk factor for depressive and anxiety symptoms among families of different stigmatized groups (Eaton et al. 2016; Robinson and Brewster 2016).

Mediating Roles of Courtesy Stigma and Parental Self-stigma

Parents of children with ASD may be distressed by not only the public stigma against their children, but also the courtesy stigma against themselves (Chan and Lam 2017). Courtesy stigma refers to the negative reactions of the general population toward associates of individuals with a discredited attribute (Goffman 1963). Research shows that parents of children with ASD are often mistakenly blamed for causing their children's disabilities through hereditary transmission and suboptimal parenting practices (Neely-Barnes et al. 2011; Wong et al. 2016). Moreover, due to their children's social deficits and behavioral problems, these parents may be unjustly criticized for lacking parental competence and being unable to control and discipline their children (Chan and Lam 2016).

According to a progressive model of stigma, the societal stigma may adversely affect parents of children with ASD via self-stigmatization (Corrigan et al. 2011). Facing constant disapproval from the public, these parents may start applying the stigmatizing views toward themselves and developing self-stigmatizing beliefs (Wong et al. 2016). Self-stigma refers to stigmatized individuals' endorsement of societal negative evaluations and assimilation of such judgments into their own self-perceptions (Chan and Lam 2018). As self-stigma entails the internalization of community stigma toward the self and the development of negative self-thoughts, self-stigma may have a more deleterious psychological impact than courtesy stigma (Chan and Lam 2018).

Self-stigma may have important implications for the mental health of parents of children with ASD (Mak and Kwok 2010). Specifically, parents with self-stigma may develop negative self-evaluations, perceive themselves as incompetent and lesser to others, and suffer diminished self-esteem and self-worth (Chan and Lam 2017). They may also feel embarrassed by and ashamed of their parental roles, and thus experience heightened caregiving burden and parenting

stress (Chan and Lam 2018). Furthermore, they may anticipate communal rejection, and hence avoid and withdraw from social activities and interpersonal relationships (Chan and Lam 2018). The potential mental health outcomes are intensified psychological distress, elevated negative mood, and increased affective symptoms (Chan and Lam 2018).

Background and Objectives of the Present Study

Although increasing efforts have been directed at understanding ASD-related stigma in Western communities (Liao et al. 2019; Papadopoulou et al. 2019), little research on this topic has been conducted in a Chinese context (Chan and Lam 2016, 2017, 2018). Indeed, such research may be particularly important in Chinese communities, given that the impact of stigma may be more salient in the Chinese collectivist culture (Li et al. 2019): Because Chinese culture emphasizes group harmony, many children with ASD may be criticized for their aberrant acts that violate social norms (Lam et al. 2010). Also, as Chinese culture focuses on the family roots of developmental disabilities, many Chinese parents may be blamed for bringing about their children's autistic symptoms (Werner and Shulman 2015). Furthermore, since Chinese culture places great importance on social identity and social acceptance, many Chinese families of children with ASD may have a heightened sensitivity to the societal stigma against themselves (Mak and Kwok 2010). Once they are stigmatized and discriminated, they may be vulnerable to elevated distress and increased risks of emotional problems (Chan and Lam 2018).

To date, research has shown the intrafamilial and intergenerational transmissions of psychopathology in Chinese families of children with ASD (Chan et al. 2018a). However, to our best knowledge, no study has examined the potential mediating roles of enacted and felt stigma in the transmissions. The present study aimed to test a mediation model of psychopathology and stigma among families of children with ASD from Hong Kong, China. Grounded in a family system perspective and a progressive model of stigma, this study examined whether child autistic symptoms (i.e., social communication and interaction deficits and restricted and repetitive behaviors) would affect parental affective symptoms (i.e., depression and anxiety) through enacted stigma (i.e., public and courtesy stigma) and felt stigma (i.e., vicarious and self-stigma). We hypothesized that: (1) social communication and interaction deficits and restricted and repetitive behaviors in child autism would be positively associated with experiences of public and courtesy stigma; (2) while public stigma would be positively associated with parental vicarious stigma, courtesy stigma would be positively associated with parental self-stigma; (3) both vicarious and

self-stigma would be positively associated with depressive and anxiety symptoms among parents of children with ASD. Given previous research showing that demographic and clinical factors, such as child and parental age and education level and the presence of intellectual disability, may affect the endogenous variables in our analytic model (Chan and Lam 2017), we controlled for these factors in the analyses.

Methods

Procedures and Participants

Participants were recruited from 14 special schools and 4 autism service centers in Hong Kong, China. Parents of children with ASD were first introduced to the study through posters, leaflets, and announcements at the special schools and autism service centers. Parents with initial interest in joining the study contacted our research assistants, who further explained the study to them and ascertained their eligibility. Inclusion criteria were parenting at least one child who had been diagnosed with an ASD according to the DSM-5 by a licensed clinician and being capable of reading and writing in Chinese. Eligible parents were asked to sign written consent forms and complete self-administered questionnaires about themselves and their children with ASD. A total of 441 parents eventually participated. Each participant received a monetary honorarium of HK\$200 (or about US\$26). This study was approved by the research ethics committee of The Education University of Hong Kong and was conducted between December 2018 and May 2019.

The average age of the participating parents was 45.64 years ($SD=6.83$ years) and that of their children with ASD was 11.47 years ($SD=3.97$ years). Most of the children were male (83.4%), and had an intellectual disability (77.6%). Most of the parents were mothers (82.1%), married (86.6%), and not employed (56.9%), and had received a high school education or above (95.9%). Their median monthly household income was between HK\$20,001 and HK\$25,000 (or about US\$2,568 and US\$3,210). The parents reported taking care of their children with ASD for an average of 100.25 h ($SD=57.08$ h) per week.

Measures

Table 1 provides an overview of the measures used in the present study.

Child Autistic Symptoms

Child autistic symptoms were measured with the Childhood Autism Rating Scale (CARS; Park and Kim 2016; Schopler et al. 1980). This scale contained 15 items with

Table 1 Overview of measures

Variable	Measure	Content descriptions	Sample items
Child autistic symptoms	Childhood Autism Rating Scale (Schopler et al. 1980)	Five items measuring social communication and interaction deficits and ten items measuring restricted and repetitive behaviors	Social communication and interaction deficits: Relating to people Emotional response Restricted and repetitive behaviors: Adaptation to change Taste, smell, and touch response and use
Experiences of public stigma	Child Stigma Scale (Elafros et al. 2013)	Three items measuring respondents' perceptions of the societal stigma toward their children with ASD	Because of my child's ASD, people are uncomfortable with my child Because of my child's ASD, people treat my child like an inferior person Because of my child's ASD, people would prefer to avoid my child
Experiences of courtesy stigma	Parental Stigma Scale (Mickelson et al. 1999)	Four items measuring respondents' perceptions of the societal stigma toward themselves as parents of children with ASD	People treat me differently when they find out that I have a child with ASD People look down on me because I have a child with ASD I have been excluded from social gatherings because I have a child with ASD
Parental vicarious stigma	Vicarious Affiliate Stigma Scale (Robinson and Brewster 2016)	Seven items measuring the extent to which respondents experienced psychological pain when they realized the adverse impact of stigma on their children with ASD	I worry that my child with ASD might experience emotional pain from being stigmatized I worry the stigma my child with ASD faces will affect his/her physical health It bothers me that many things will be harder in life for my child because he/she has ASD
Parental self-stigma	Affiliate Stigma Scale (Mak and Cheung 2008)	Twenty-two items measuring the extent to which respondents endorsed self-stigmatizing thoughts about being parents of children with ASD	Having a child with ASD imposes a negative impact on me Having a child with ASD makes me think that I am incompetent compared to other people Having a child with ASD makes me lose face
Parental depressive symptoms	Patient Health Questionnaire (Kroenke et al. 2001)	Nine items measuring the extent to which respondents had symptoms of depression	Over the last two weeks, how often have you been bothered by: Little interest or pleasure in doing things? Feeling down, depressed, or hopeless? Feeling tired or having little energy?
Parental anxiety symptoms	Generalized Anxiety Disorder Scale (Spitzer et al. 2006)	Seven items measuring the extent to which respondents had symptoms of anxiety	Over the last two weeks, how often have you been bothered by: Feeling nervous, anxious, or on edge? Not being able to stop or control worrying? Worrying too much about different things?

two subscales that measured social communication and interaction deficits (5 items) and restricted and repetitive behaviors (10 items), respectively. Participants rated each item on a 4-point Likert scale ranging from 1 (*normal*) to 4 (*severely abnormal*). The ratings were summed, with higher scores representing higher levels of symptom severity. The two subscales of the CARS have been used to indicate the two types of autistic symptoms among children with ASD (Chen et al. 2018). In previous studies, their validity was evinced by their significant correlations with theoretically related constructs, and their reliability was shown by their high internal consistency (Chan and Leung 2020). In the present study, Cronbach's alphas were 0.77 (social communication and interaction deficits subscale) and 0.88 (restricted and repetitive behaviors subscale).

Experiences of Public Stigma

Experiences of public stigma were measured with an adapted version of the Child Stigma Scale (Elafros et al. 2013). This adapted scale contained 3 items measuring respondents' perceptions of the societal stigma toward their children with ASD. Participants rated each item on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). The ratings were averaged, with higher scores representing higher levels of experienced public stigma. This measure has been used to indicate public stigma against children with disabilities (Hansen et al. 2018). In previous studies, its validity was evinced by its significant correlations with theoretically related constructs, and its reliability was shown by its high internal consistency (Hansen et al. 2018). In the present study, Cronbach's alpha was 0.92.

Experiences of Courtesy Stigma

Experiences of courtesy stigma were measured with an adapted version of the Parental Stigma Scale (Mickelson et al. 1999). This adapted scale contained 4 items measuring respondents' perceptions of the societal stigma toward themselves as parents of children with ASD. Participants rated each item on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). The ratings were averaged, with higher scores representing higher levels of experienced courtesy stigma. This measure has been used to indicate courtesy stigma against parents of children with disabilities (Mickelson 2001). In previous studies, its validity was evinced by its significant correlations with theoretically related constructs, and its reliability was shown by its high internal consistency (Mickelson 2001). In the present study, Cronbach's alpha was 0.94.

Parental Vicarious Stigma

Parental vicarious stigma was measured with an adapted version of the Vicarious Affiliate Stigma Scale (Robinson and Brewster 2016). This adapted scale contained 7 items measuring the extent to which respondents experienced psychological pain when they realized the adverse impact of stigma on their children with ASD. Participants rated each item on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The ratings were averaged, with higher scores representing higher levels of parental vicarious stigma. This measure has been used to indicate vicarious stigma among parents of individuals with stigmatized identities (Robinson and Brewster 2016). In previous studies, its validity was evinced by its significant correlations with theoretically related constructs, and its reliability was shown by its high internal consistency (Robinson and Brewster 2016). In the present study, Cronbach's alpha was 0.95.

Parental Self-stigma

Parental self-stigma was measured with an adapted version of the Affiliate Stigma Scale (Mak and Cheung 2008). This adapted scale contained 22 items measuring the extent to which respondents endorsed self-stigmatizing thoughts about being parents of children with ASD. Participants rated each item on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The ratings were averaged, with higher scores representing higher levels of parental self-stigma. This measure has been used to indicate self-stigma among parents of individuals with stigmatized identities (Mak and Kwok 2010). In previous studies, its validity was evinced by its significant correlations with theoretically related constructs, and its reliability was shown by its high internal consistency (Mak and Kwok 2010). In the present study, Cronbach's alpha was 0.94.

Parental Depressive Symptoms

Parental depressive symptoms were measured with the Patient Health Questionnaire (Kroenke et al. 2001). This scale contained 9 items measuring the extent to which respondents had symptoms of depression. Participants rated each item on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). The ratings were summed, with higher scores representing higher levels of depression and scores ≥ 10 indicating clinically significant depression. This measure has been used to assess depressive symptoms among parents of children with ASD (Chan and Lam 2017). In previous studies, its validity was evinced by its significant correlations with theoretically related constructs, and its reliability was shown by its high internal consistency (Chan and Lam 2017). In the present study, Cronbach's alpha was 0.91.

Parental Anxiety Symptoms

Parental anxiety symptoms were measured with the Generalized Anxiety Disorder Scale (Spitzer et al. 2006). This scale contained 7 items measuring the extent to which respondents had symptoms of anxiety. Participants rated each item on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). The ratings were summed, with higher scores representing higher levels of anxiety and scores ≥ 10 indicating clinically significant anxiety. This measure has been used to assess anxiety symptoms among parents of children with ASD (Chan and Lam 2017). In previous studies, its validity was evinced by its significant correlations with theoretically related constructs, and its reliability was shown by its high internal consistency (Chan and Lam 2017). In the present study, Cronbach's alpha was 0.95.

Data Analyses

Descriptive statistics were calculated for all variables to characterize the sample. Then, correlation analyses were carried out to examine the interrelations among the variables. Finally, path analyses were conducted to evaluate the hypothesized mediation model. A path model was tested to assess the associations among child autistic symptoms, experiences of public and courtesy stigma, parental vicarious and self-stigma, and parental affective symptoms. Data-model fit was inspected using four goodness of fit indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). A good fit was indicated by CFI and TLI values ≥ 0.90 and RMSEA and SRMR values ≤ 0.08 (Hu and Bentler 1999). Following the recommendations of Shrout and Bolger (2002), the statistical significance of indirect effects was evaluated with the bias-corrected bootstrap method, which could provide more accurate confidence intervals (MacKinnon et al. 2004). Bias-corrected confidence intervals were generated based upon 1,000 bootstrapped samples from the data. A

significant indirect effect was indicated by the lack of zero in the 95% confidence interval. All analyses were performed using Mplus Version 8.4.

Results

Table 2 summarizes the results of descriptive and correlation analyses. Descriptive analyses showed that the prevalence rates of clinically significant depression and anxiety in parents were 25.4% and 18.6%, respectively. Correlation analyses showed that the two types of child autistic symptoms (i.e., social communication and interaction deficits and restricted and repetitive behaviors), experiences of public and courtesy stigma, parental vicarious and self-stigma, and the two types of parental affective symptoms (i.e., depression and anxiety) were positively correlated with one another ($ps < 0.001$). These correlations ranged from modest to strong in strength.

Table 3 summarizes the results of path analyses. Both social communication and interaction deficits and restricted and repetitive behaviors in child autism had significant direct effects on experiences of public ($ps \leq 0.001$) and courtesy ($ps \leq 0.02$) stigma. Public stigma had significant direct effects on parental vicarious stigma ($p < 0.001$), while courtesy stigma had significant direct effects on parental self-stigma ($p < 0.001$). Both vicarious and self-stigma had significant direct effects on depressive ($ps < 0.001$) and anxiety ($ps < 0.001$) symptoms among parents.

Figure 1 shows the path model. In the path model, standardized path coefficients, ranging between 0.14 ($p = 0.02$) and 0.64 ($p < 0.001$), were all statistically significant. The path model demonstrated a good fit to the data: CFI = 0.95, TLI = 0.91, RMSEA = 0.08, SRMR = 0.06. The explained variances were 22.3%, 13.0%, 27.9%, 43.7%, 23.6%, and 24.0% for experiences of public and courtesy stigma, parental vicarious and self-stigma, and parental depressive and anxiety symptoms, respectively.

Table 2 Descriptive statistics of and correlations among variables

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8
1. Child social communication and interaction deficits	13.19	3.69	0.70***	0.41***	0.31***	0.28***	0.34***	0.22***	0.21***
2. Child restricted and repetitive behaviors	24.81	7.18		0.44***	0.32***	0.21***	0.38***	0.35***	0.33***
3. Experiences of public stigma	3.08	0.98			0.66***	0.51***	0.57***	0.39***	0.42***
4. Experiences of courtesy stigma	2.46	0.94				0.49***	0.65***	0.47***	0.47***
5. Parental vicarious stigma	4.64	1.05					0.40***	0.33***	0.34***
6. Parental self-stigma	2.32	0.66						0.45***	0.46***
7. Parental depressive symptoms	6.50	5.76							0.85***
8. Parental anxiety symptoms	5.39	5.51							

*** $p < 0.001$

Table 3 Standardized parameter estimates for the path model

	Standardized β
Direct path	
Child social communication and interaction deficits → Experiences of public stigma	0.18**
Child social communication and interaction deficits → Experiences of courtesy stigma	0.14*
Child restricted and repetitive behaviors → Experiences of public stigma	0.26***
Child restricted and repetitive behaviors → Experiences of courtesy stigma	0.23***
Experiences of public stigma → Parental vicarious stigma	0.52***
Experiences of courtesy stigma → Parental self-stigma	0.64***
Parental vicarious stigma → Parental depressive symptoms	0.16***
Parental vicarious stigma → Parental anxiety symptoms	0.18***
Parental self-stigma → Parental depressive symptoms	0.37***
Parental self-stigma → Parental anxiety symptoms	0.39***
Covariance	
Child social communication and interaction deficits ↔ Child restricted and repetitive behaviors	0.70***
Experiences of public stigma ↔ Experiences of courtesy stigma	0.62***
Parental vicarious stigma ↔ Parental self-stigma	0.03
Parental depressive symptoms ↔ Parental anxiety symptoms	0.81***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

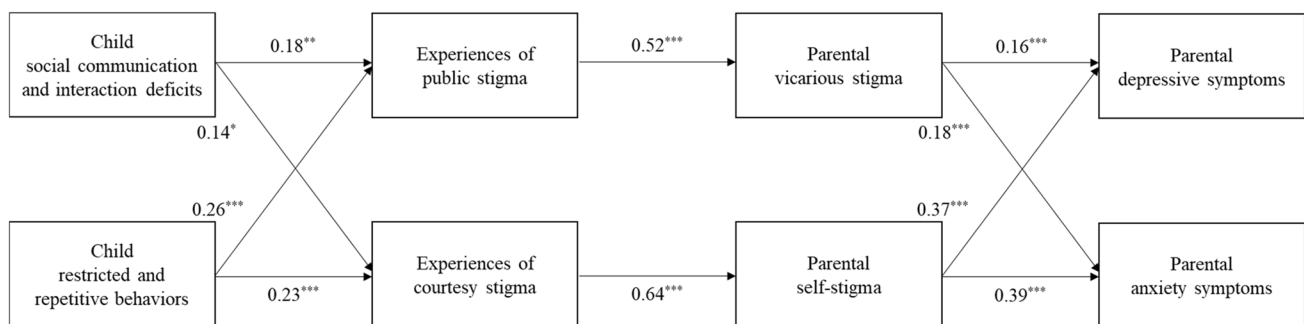


Fig. 1 Mediation model of psychopathology and stigma among families of children with ASD. Standardized path coefficients are shown. Covariates and covariances are not shown for clarity. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4 summarizes the results of Bootstrap analyses. The total indirect effects of the two types of child autistic symptoms on the two types of parental affective symptoms were significant ($ps < 0.02$). Specifically, social communication and interaction deficits in child autism had significant indirect effects on parental depressive and anxiety symptoms via experiences of public stigma and parental vicarious stigma ($ps < 0.04$) and via experiences of courtesy stigma and parental self-stigma ($ps < 0.04$). Restricted and repetitive behaviors in child autism also had significant indirect effects on parental depressive and anxiety symptoms via experiences of public stigma and parental vicarious stigma ($ps < 0.01$) and via experiences of courtesy stigma and parental self-stigma ($ps < 0.01$).

Discussion

Consistent with our hypotheses, child autistic symptoms were linked to higher levels of parental affective symptoms through two pathways: via parental perceptions of public stigma and feelings of vicarious stigma and via parental perceptions of courtesy stigma and feelings of self-stigma. These findings indicated that children's social communication and interaction deficits and restricted and repetitive behaviors might lead to instances of discrimination against themselves as well as their parents. In turn, parents' awareness of their children's discriminatory experiences might evoke empathy-induced psychological distress, causing

Table 4 Bootstrap analyses of indirect effects in the path model

	Standardized indirect effect [95% CI]
Child social communication and interaction deficits → Experiences of public stigma → Parental vicarious stigma → Parental depressive symptoms	0.02* [0.001, 0.030]
Child social communication and interaction deficits → Experiences of courtesy stigma → Parental self-stigma → Parental depressive symptoms	0.03* [0.002, 0.062]
Child social communication and interaction deficits → Experiences of public stigma → Parental vicarious stigma → Parental anxiety symptoms	0.02* [0.002, 0.032]
Child social communication and interaction deficits → Experiences of courtesy stigma → Parental self-stigma → Parental anxiety symptoms	0.03* [0.002, 0.066]
Child restricted and repetitive behaviors → Experiences of public stigma → Parental vicarious stigma → Parental depressive symptoms	0.02** [0.005, 0.037]
Child restricted and repetitive behaviors → Experiences of courtesy stigma → Parental self-stigma → Parental depressive symptoms	0.05** [0.015, 0.091]
Child restricted and repetitive behaviors → Experiences of public stigma → Parental vicarious stigma → Parental anxiety symptoms	0.02** [0.008, 0.040]
Child restricted and repetitive behaviors → Experiences of courtesy stigma → Parental self-stigma → Parental anxiety symptoms	0.06** [0.017, 0.094]

* $p < 0.05$; ** $p < 0.01$

their development of vicarious stigma. Meanwhile, parents' personal discriminatory experiences might elicit a sense of marginalization and disempowerment, triggering their exacerbation of self-stigma. Importantly, both vicarious and self-stigma might adversely affect mental health and give rise to heightened levels of depression and anxiety among parents of children with ASD.

In line with prior studies showing the intrafamilial and intergenerational transmissions of psychopathology (Chan et al. 2018a), the present study reported positive associations between child autistic symptoms and parental affective symptoms. By considering child autism symptomatology as a multidimensional construct (Park and Kim 2016), this study found that both social communication and interaction deficits and restricted and repetitive behaviors of children with ASD could contribute to depressive and anxiety symptoms among their parents. Notably, these findings are consistent with earlier studies showing that child autism might increase the caregiving stress in parents of children with ASD (Hayes and Watson 2013), and that parenting a child with ASD might have detrimental effects on psychological wellness (Neff and Faso 2015; Padden and James 2017). Given the mental health challenges of parents of children with ASD, practitioners should develop interventions to enhance psychological resilience and improve emotional well-being among these parents (Da Paz and Wallander 2017).

Building upon previous research on the stigma around ASD (Chan and Lam 2016, 2017, 2018), the present study showed that both social communication and interaction deficits and restricted and repetitive behaviors in child autism were risk factors for experienced discrimination among

children with ASD and their parents. In support of theories that posit aberrant acts as risk factors for social rejection (Hinshaw and Stier 2008), our study found a positive relation between child autism severity and experienced public stigma. Also, in keeping with past studies showing the public's blaming of parents for children's aberrant acts (Neely-Barnes et al. 2011; Wong et al. 2016), our study found a positive association of child autism severity with experienced courtesy stigma. Taken together, our findings pointed to the utility of a family-based approach to understanding the complex and pervasive influences of ASD-related stigma (Chan and Lam 2017).

Consistent with past studies showing child experienced discrimination as a predictor of parental psychological distress (Chan and Lam 2017; Gray 1993, 2002; Green 2003), our study revealed positive associations between public stigma and affective symptoms among parents of children with ASD. Moreover, echoing some earlier work documenting vicarious stigma as a mediator linking significant others' experienced discrimination to one's own mental health (Eaton et al. 2016), our findings indicated that public stigma could result in parental affective symptoms through inducing vicarious stigma and inflicting emotional pain in the parents. Given the family-wide impact of the public stigma of ASD, efforts to improve the societal views of the disorder may have positive effects not only for the affected children, but also have rippling effects throughout their families.

Previous research has suggested that self-stigma may mediate the harmful effects of courtesy stigma on families of stigmatized children (Chan and Lam 2017, 2018). Expanding upon this work, our study pointed to the mediating role of self-stigma in the links between courtesy stigma

and affective symptoms among parents of children with ASD. Specifically, our findings showed that the societal stigma might exert its impact on parental mental health through increasing negative self-thoughts and triggering affective symptoms. These findings suggested the importance of building stigma resistance to alleviate self-stigmatizing thoughts, which, when left unattended, are likely to adversely affect mood and well-being (Chan et al. 2018b; Farrugia 2009).

Our findings on the damaging effects of public and courtesy stigma suggested an urgent need to design effective community-based anti-stigma programs. In order to reduce the societal stigma around ASD, knowledge-based interventions, which emphasize challenging erroneous and negative beliefs about families of children with ASD and replacing these beliefs with unbiased information, should be offered to lessen prejudicial views in community members (Mak and Kwok 2010). Also, contact-based interventions, which help facilitate positive social contacts and exchanges between families with and without children with ASD, should be provided to improve the public's attitudes toward the disorder and the families (Mak and Kwok 2010). Furthermore, community-wide policies (e.g., anti-discrimination laws) and events (e.g., advocacy campaigns) should be carried out to reduce discriminatory acts and boost the awareness of human rights in society (Heijnders and Van Der Meij 2006).

As eradicating stigma at the societal level is a long process, an important question from a short-term perspective is how we can promptly mitigate the negative impact of the societal stigma on parental well-being. As indicated by the mediating role of felt stigma in the associations between enacted stigma and affective symptoms, one way to improve the mental health of parents of children with ASD may be through changing the internal experience of the external stigma (Broady et al. 2017; Papadopoulos et al. 2019). Given the pivotal role of felt stigma in translating enacted stigma into adverse mental health consequences, future services for parents of children with ASD should consider including interventions that target felt stigma (Broady et al. 2017; Papadopoulos et al. 2019).

It is notable that, after controlling for self-stigma, vicarious stigma significantly predicted mental health outcomes, meaning that, aside from feeling bad for oneself, feeling bad for significant others could also affect individual well-being. Given the independent effects of vicarious and self-stigma, psychological services for parents of children with ASD should be geared toward tackling both forms of felt stigma. To alleviate vicarious stigma, practitioners may help parents cope with the negative impact of public stigma on their children, thereby reducing the intensity and duration of their empathy-induced psychological suffering (Chan and Lam 2017). Moreover, to mitigate self-stigma, practitioners may help parents build critical consciousness that enables them

to recognize the illegitimacy, and reduce the internalization, of courtesy stigma (Chan and Lam 2018).

The present study represented one of the first initiatives to validate a conceptual model elucidating the mediating roles of enacted and felt stigma in the links between child autistic symptoms and parental affective symptoms. In validating the model among Chinese families, we moved beyond the typical focus on Western families to examine the implications of stigma in the Chinese collectivist culture. It is worth mentioning that the impact of stigma may be particularly salient in a collectivist culture because of its focus on group harmony and social acceptance (Li et al. 2019). Given prior research showing differences between the Chinese collectivist and Western individualist cultures in the salience of stigma (Papadopoulos et al. 2013), future studies should further validate our model in different cultural contexts in order to establish its universal applicability.

Limitations

The present study had several limitations. First, our cross-sectional design did not permit an examination of the causal relations among variables. Future studies should employ longitudinal designs to clarify the temporal orders of the associations documented here. Second, all our measures were based on parents' self-reports, meaning that our results might be subject to common method biases. Future studies should use multiple methods (e.g., questionnaires, interviews, and clinical records) to collect data from multiple informants (e.g., parents, children, and therapists) to confirm our findings. Third, our sample consisted primarily of male children and female parents, which was not representative of the gender diversity of children with ASD and their parents. In addition, most children in our sample had a comorbid diagnosis of intellectual disability, which might limit the generalizability of our results. Future studies should use representative samples of families of children with ASD to retest our hypotheses.

Conclusions

Notwithstanding these limitations, the present study had important theoretical contributions and practical implications. Theoretically, our findings demonstrated how child autistic symptoms (i.e., social communication and interaction deficits and restricted and repetitive behaviors) could heighten parental affective symptoms (i.e., depression and anxiety) through the means of enacted stigma (i.e., public and courtesy stigma) and felt stigma (i.e., vicarious and self-stigma). Practically, our findings highlighted the importance of developing interventions to alleviate enacted and felt stigma at the societal and individual levels in order to reduce

stigma-related stress and improve mental health outcomes among families of children with ASD.

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Author Contributions KKSC developed the research question, executed the study, analyzed the data, and wrote and revised the paper. DCKL collaborated in writing and revising the paper. All authors approved the final version of the paper.

Compliance with Ethical Standards

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

Ethical 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.

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

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