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ORIGINAL ARTICLE

Parenting Stress and Depressive Symptoms Among Chinese Parents of Children With and Without Oppositional Defiant Disorder: A Three-Wave Longitudinal Study

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Abstract
Parents of children with oppositional defiant disorder (ODD) experience greater stress in parenting and more parental depressive symptoms. The study examined the longitudinal and bidirectional associations between three dimensions of parenting stress (i.e., parental distress, parent–child dysfunctional interaction, and difficult child) and parental depressive symptoms from a sample of Chinese parents of children with or without ODD. The sample included 256 parents of children with ODD and 265 parents of children without ODD, along with children's teachers. Using a three wave, cross-lagged design, results showed that parents of children with ODD suffered higher levels of parenting stress across three dimensions. For both groups, the links between parental depressive symptoms and subsequent parental distress and difficult child were unidirectional, whereas the relation between parental depressive symptoms and parent–child dysfunctional interaction was bidirectional. Multi-group analysis found that there was no significant difference in the relations between parenting stress and depressive symptoms between the ODD and non-ODD groups. The findings indicated that children with ODD require comprehensive services to address the stress of their parents. The study also provided support for the dynamic and longitudinal relations between specific dimensions of parenting stress and depressive symptoms among parents of children with or without ODD.

Keywords Oppositional defiant disorder · Parenting stress · Parental depressive symptoms · Longitudinal

Introduction

Oppositional defiant disorder (ODD) is characterized as a recurrent pattern of emotional and behavioral symptoms, including angry/irritable mood, argumentative/defiant behavior, and vindictiveness toward authority figures or, for children and adolescents, toward adults [1]. As one of the most prevalent mental health disorders among children, it is estimated that the prevalence rates for ODD range between 1 and 11%, with an overall average of approximate 3.3%, according to the *Diagnostic and Statistical Manual of Mental Disorders*-5th edition [1]. Well-established in previous research, children diagnosed with ODD tend to disrupt interpersonal harmony and perform worse academically [2–4]. Raising children with ODD also negatively influence the parents, including increase in parenting stress and parental

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mental health problems such as depressive symptoms [5], which potentially fuels a vicious cycle of escalating levels of oppositional behavior of children [6]. However, prior research on families of children with ODD has primarily focused on the development and wellbeing of the children, with limited attention paid to understanding the relations between parenting stress and parents' mental health in these families. Therefore, in the present study, we examined the longitudinal relationships between parenting stress and parental depressive symptoms in families of children with ODD, and further explored whether these relationships were different from parents of children without ODD, using a sample of Chinese families. Understanding such longitudinal relations would deepen our understanding of parental functioning in families of children with ODD and have important implications for developing family-based intervention to decrease parenting stress and promote parents' mental health.

Parenting stress refers to the difficulty that parents feel or experience while raising their children [7–9]. Parenting stress can be perceived from different sources, such as parental characteristics, child characteristics, and parent–child relationships [7, 8]. Parenting Stress Index (PSI) is a scale commonly used to measure the multidimensional construct of parenting stress. Specifically, PSI includes three dimensions related to parenting stress: parental distress (i.e., the level of distress that parents feel in regard to their parenting role), difficult child (i.e., parents' perception that their child is temperamentally difficult), and parent–child dysfunctional interaction (i.e., parents' perception that their interactions and relationships with their children are dysfunctional, stressful, or unsatisfactory).

Previous research has indicated that parenting stress was elevated among parents of children with disruptive behavior disorder, which include attention deficit hyperactivity disorder (ADHD), conduct disorder (CD) and ODD [1]. For example, Gordon and Hinshaw [10] sampled 120 girls with ADHD aged 6–12 and 81 comparison girls and found that parents of girls with ADHD experienced more parental distress and parent–child dysfunctional interaction than comparison parents. Similarly, parents of children with ODD experienced higher parenting stress than parents of typically developed children [10, 11], likely due to increased parenting demands. For instance, Kashdan et al. [12] found that parents of children with ODD were more prone to stress related to parent–child dysfunctional interactions by using a sample of children aged 5–12 years. Additionally, research conducted in Chinese elementary schools also indicated that raising children with ODD contributed to higher levels of parenting stress across multiple dimensions [13, 14].

In addition to experiencing higher levels of parenting stress, studies have shown that parents of children with disruptive behavior disorders, especially those with ADHD, were at greater risk for poor psychological well-being and depression [15, 16]. For instance, Harrison and colleagues sampled mothers of children with an average age of 8.25 and found that mothers of children with ADHD reported high levels of depression. Parents of children with ADHD were more likely to experience depressive symptomatology than parents of controls [17, 18]. Yet, little research has examined the parental depressive symptoms of parents of children with ODD. In fact, the characteristics of children with ODD can lead to severe negative mood of their parents [19]. For example, one study conducted in a sample of 9–12 year old children illustrated that parents of children with ODD were emotionally distressed because of their children's irritable emotions and defiant behaviors [15]. Thus, parents of children with ODD are expected to suffer more depressive symptoms than the comparison group.

Several studies have investigated the relationship between parenting stress and parental depressive symptoms. Beck proposed the model of depression [20] to describe the potential influence of parenting stress on parental depressive symptoms. This model hypothesized that the individual experienced some sort of stressor, then activating individual negative cognitions associated with depression and contributing to depressive symptoms [21]. Prior empirical studies have also documented that higher level of parenting stress was associated with more parental mental health problems, such as depressive symptoms [22, 23]. For instance, in a sample of children aged 8–12 years, parenting stress was related to more depressive symptoms among parents of children with post-traumatic stress disorder [24]. Additionally, one study conducted by Lin and colleagues [19] found that parenting stress significantly predicted parental depressive symptoms among parents of elementary school children with ODD in Mainland China. Although researchers suggested that high parenting stress resulted in more parental depressive symptoms, the longitudinal relationship between parenting stress and depressive symptoms among parents of children with ODD is not yet clear from these cross-sectional studies.

Some researchers also advocate that parental depressive symptoms may influence parenting stress. According to Abidin's model [7] of parenting stress, parent psychopathology (e.g. depression) is one of the most important risk factors for parenting stress, which applies to both community-based and clinical family samples. Nevertheless, no longitudinal study to our knowledge has investigated the relationship between parental depressive symptoms and parenting stress among parents of children with ODD, although several studies have been conducted among infants and children with other disorders. For example, Cornish et al. [25] found that in the second postnatal year, mothers suffering from depression reported higher levels of parenting stress than non-depressed mothers. Moreover, parental depression

was linked to parenting stress in parents who reared children with developmental challenges at the age of 2–7 [26, 27]. Similar results have been found among parents of children with autism spectrum disorder (ASD) and/or ADHD [28]. Yet, only one longitudinal study examined and found bidirectional linkages between parental depressive symptoms and parenting stress over time, using a sample of parents with typically developing infants [29].

Notably, the relationships between parenting stress and parental depressive symptoms may differ across different dimensions of parenting stress [21, 30]. For example, parental distress has been shown to be strongly associated with parental depressive symptoms [25]. However, mixed findings were found regarding the link between difficult child and parental depression. For instance, Whalen and Henker [31] found that perceived stress of difficult child was associated with increased in parental depression among parents of children with ADHD, but other studies found no significant links between them [32]. Similarly, mixed findings have been found regarding the relation between stress of parent–child dysfunctional interaction and parental depression [24, 32]. Considering the inconsistent findings regarding the relation between specific dimensions of parenting stress and parental depressive symptoms, parenting stress should not be examined as a unidimensional construct. In the present study, we examined the bidirectional associations between three dimensions of parenting stress and parental depressive symptoms.

Additionally, prior research suggested the need to consider the potential difference of child ODD status in the relation between parenting stress and depressive symptoms. Given the heightened levels of parenting stress [2, 3, 33] and depressive symptoms [34] experienced by parents of children with ODD, the relationship between parenting stress and parental depressive symptoms may be even more pronounced for these parents. In comparison, children without ODD were less likely to behave defiantly, and their parents may experience relatively lower level of parenting stress and parental depressive symptoms [33]. As a result, the relationships between parenting stress and parental depressive symptoms may be weaker. Therefore, it was important to examine whether the associations between parenting stress and parental depressive symptoms differ between children with ODD and children without ODD.

Influence of Chinese Culture

It's worth noting that Chinese culture is different from Western culture in several ways, which may have implications for the differences in the relationship between parenting stress and depressive symptoms between families in Chinese and Western cultures. First, cultural differences in the individualistic and collectivist orientations of East Asian, North American and European cultures may lead to differences in social expectations of children's behavior. Specifically, since Chinese parents' sense of value depends on their children's performance and achievement, they may feel more parenting stress when raising children than American parents [35]. This is particularly relevant in single-child families, which represent the majority of families in the current study.

Second, there are also differences across cultures in emotional expression. Chinese people are encouraged to inhibit emotion expression, which may contribute to more parental depressive symptoms [36]. In contrast, people in Western countries, such as the United States, are encouraged to express emotion [37], which may help reduce parental depression to some extent. In light of these differences, we extend the literature by examining associations between parenting stress and parental depressive symptoms among Chinese parents.

The Present Study

The current study examined the longitudinal and potentially bidirectional relationships between three dimensions of parenting stress and parental depressive symptoms among parents of children with and without ODD. The proposed model was presented in Fig. 1. First, we examined whether there were differences in mean levels of parenting stress and depressive symptoms between parents of children with and without ODD. Given that parents of children with ODD are more prone to stress and depression, we hypothesized that, in comparison to parents of children without ODD, parents of children with ODD would report significantly higher levels of parenting stress (including parental distress, parent–child dysfunctional interaction, and difficult child) and more depressive symptoms. Second, we examined the mutual relationships between specific dimensions of parenting stress and parental depressive symptoms in parents of children with ODD or without ODD over time. We hypothesized that the relationships between the three dimensions of parenting stress and depressive symptoms would be bidirectional in both groups. Finally, we conducted multi-group analysis to test whether there were significant differences in the associations between parenting stress and depressive symptoms between parents of children with and without ODD. We hypothesized that the associations between parenting stress and depressive symptoms would be stronger in the ODD group, compared to parents of children without ODD.

Method

Participants and Procedure

Data for the present study came from a research project examining family processes and psychological outcomes in

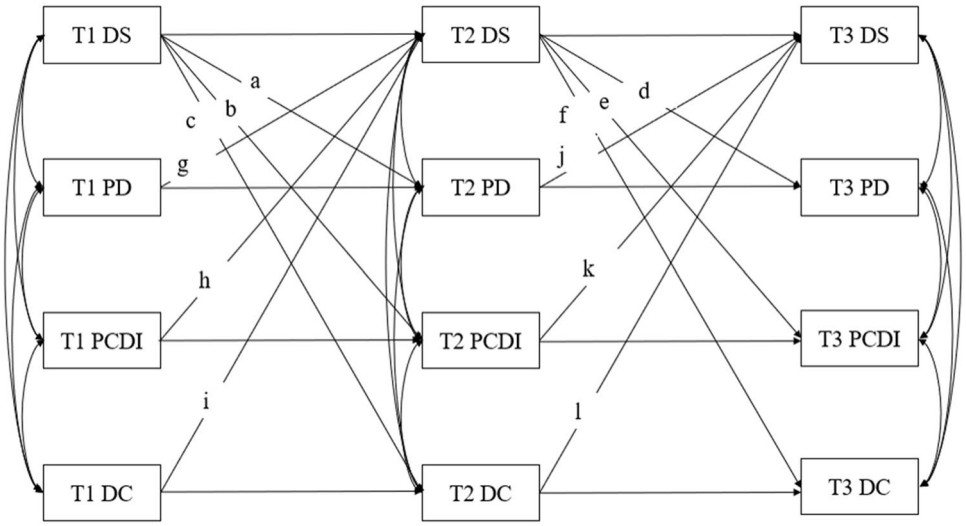

Fig. 1 Proposed model of the reciprocal relationships between three dimensions of parenting stress and parental depressive symptoms. "T1, T2, T3" indicate that data were collected in the first year, in the second year, and in the third year. *DS* depressive symptoms, *PD* parental distress, *PCDI* parent–child dysfunctional interaction, *DC* difficult child. Curve represent covariance correlation and straight lines represent direct effect. Path "a" to path "f" represented the effects of parental depressive symptoms to three dimensions of parenting stress, and path "g" to path "l" represented the effects of three dimensions of parenting stress to parental depressive symptoms

Chinese families of children with ODD. First, we reached out to 20 primary school psychologists and invited them to participate in this study. Of these schools, a total of 14 primary schools in northern, eastern and southwestern China agreed to participate. Then, school psychologists sent invitations to invite class master teachers who taught first through fifth grade students in classrooms to participate in the study. A total of 187 class master teachers agreed to participate. Participating class master teachers were asked to nominate children in their classrooms who exhibited ODD symptoms, using an assessment checklist of ODD developed according to the diagnostic and statistical manual of mental disorders [1].

A total of 360 out of 7966 children in the participating schools were nominated by class master teachers as having ODD symptoms. After the nomination, two clinical psychologists from the Beijing Normal university interviewed each participating class master teacher to individually confirm each candidate child's ODD diagnosis, using a semi-structured interview adapted based on the DSM-IV-TR's ODD diagnostic criteria. The ODD diagnostic criteria included were the following: (a) the child exhibits four or more symptoms of ODD described in DSM-IV-TR; (b) the child's identified ODD symptoms have lasted for six months or more; and (c) the child demonstrates a significant impairment across psychosocial functional domains. Only those children who were rated to display four or more symptoms were considered as candidates for further investigation. A total of 305 children were confirmed to have ODD. These children were given a package containing invitation letters and informed consents about the study to take home to their parents. 282 parent–child dyads signed the informed consent and assent forms (92.5% participation rate) and a total of 256 children (from 156 classrooms) and one of their parents and class master teachers completed the first assessment (T1). These children, parents and class master teachers were followed up approximately 1 (T2) and 2 years (T3) later. At each assessment, participating parents were invited to fill out a survey on paper and return their completed surveys to the class master teachers within one week. Meanwhile, class master teachers were asked to complete a questionnaire assessing the ODD symptoms of each child participant.

The final sample of ODD included 185 boys (72.3%) and 70 girls (27.3%), with 1 missing gender information. The result of the binomial test showed that there were more boys than girls in the ODD group ($p < 0.001$), which was consistent with previous studies (DSM-5, APA, 2013). Participating children's age ranged from 6 to 13 years old ($M = 9.60$, SD = 1.57) at T1. Among child participants, 79.2% were the only child in their family. There were 153 mothers and 73 fathers included, with 30 missing parent gender information. Parents' age ranged from 25 to 53 years old ($M_{\text{mother}} = 36.66$, SD = 4.29; $M_{\text{father}} = 38.43$, SD = 5.16) at T1. Some mothers (56.6%) and fathers (61.6%) had junior college or higher levels of education. Families were from diverse socioeconomic backgrounds; 56.2% families had a monthly income over 5000 Chinese RMB at T1 (the average monthly income for Chinese urban families is about 5485 Chinese RMB) [38]. Most families were intact families where the biological parents lived together with the child (96.2%).

A comparison group of children without ODD was also recruited; the recruitment procedures were similar to those for the ODD group. Inclusion criteria were the following: (a) exhibited less than four ODD symptoms; and (b) no mental or physical disability (i.e., developmental delay). A total of 265 children without ODD (also from the 156 classrooms where children with ODD were recruited) were included. Similar to the ODD group, the non-ODD children's parents and class master teachers were also included. The non-ODD group included 140 boys (52.8%) and 125 girls (47.2%); 78.9% of these children were the only child in their family and age ranged from 6 to 13 years old (M = 9.14, SD = 1.55). In total, 180 mothers and 63 fathers were included, with 22 missing parent gender information. Parents' age ranged from 29 to 54 years old (M_{mother} = 37.35, SD = 3.82; M_{father} = 39.82, SD = 4.74). Most mothers (67.1%) and fathers (73.2%) had junior college or above education level. Families were from diverse socioeconomic levels, at T1, 73.2% families had a monthly income over 5000 Chinese RMB. Most families were intact (95.7%).

Measures

ODD Symptoms (Teacher Reported)

Class master teachers of the identified children with ODD were asked to assess children's ODD symptoms based on the 8-item diagnosis of ODD scale in DSM-IV-TR (0 = no; 1 = yes; e.g., "often loses temper", "often argues with adults") [1]. Scores were summed across the eight items. Potential scores ranged from 0–8, with higher sum scores indicating more ODD symptoms. Because of the dichotomous items, the reliability coefficients were calculated using the Kuder–Richardson Formula 20 (KR-20). In the current sample, the KR-20 Coefficient was 0.85 in T1. The results of confirmatory factor analysis (CFA) showed that the measure of ODD symptoms had good construct validity ($\chi^2(20)$ = 139.72, CFI = 0.92, TLI = 0.90, RMSEA = 0.08, SRMR = 0.04).

Parenting Stress (Parent Reported)

Parents completed the Parenting Stress Index—Short Form (PSI-SF; 9). This 36-item scale was shown to be a reliable and valid measurement for parents of elementary school-aged children in China [39–41]. The PSI-SF includes three subscales, Parental Distress assesses the level of distress that parents feel due to parenting demands (e.g., "Feel that I cannot handle things", "I feel trapped by my responsibilities as a parent"), parent–child dysfunctional interaction assesses parents' perceived stress of poor interactions with their children (e.g., "Child doesn't giggle or laugh much when playing", "Most times I feel that my child does not like me"), and Difficult Child measures parents' perceptions of their children's characteristics (e.g., "Child cries or fusses more often than other children", "I feel that my child is very moody and easily upset"). There are 12 items in each dimension. Items were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores were summed across items within each subscale, with higher scores representing higher parenting stress. The Cronbach's α for the whole scale was 0.93, 0.94, and 0.95 for ODD and non-ODD groups at T1, T2, T3, and ranged from 0.83 to 0.91 across subscales in the current study.

Parental Depressive Symptoms (Parent Reported)

Parental depressive symptoms were assessed using the 20-item Center for Epidemiologic Studies Depression Scale (CES-D) [42]. The CES-D was shown to be a reliable and valid measurement for Chinese parents [43]. Participants were asked to rate each item from 1 (*less than a day*) to 4 (*5 to 7 days of the past week*). Scores were summed across items and higher scores indicated more depressive symptoms. The Cronbach's α was 0.88, 0.87, and 0.91 for the ODD group and 0.87, 0.88 and 0.92 for the non-ODD group at T1, T2, and T3, respectively.

Missing Data

For the ODD group, the missing data of study variables were less than 13% (9.8–12.9%, 9.0–12.5%) at T1 and T2, less than 25% (20.3–25.0%) at T3. Of the 256 families who participated at T1, 245 (95.70%) participated at T2, and 208 (81.25%) families participated at T3. Most of the attrition was because of children moving to other schools. Attrition analyses revealed that except for children's and parents' age, $t_{\text{children}}(249) = 4.56$, $t_{\text{mother}}(240) = 2.20$, $t_{\text{father}}(240) = 3.35$, $ps < 0.05$, there were no significant differences in demographic variables and main study variables (i.e., parental distress, parent–child dysfunctional Interaction, difficult child, and parental depressive symptoms, $ps > .05$) between families who completed three waves of data and those who failed to participate in all the three waves. Specifically, on average, children and parents were older in families that completed three waves of assessments compared to those completed only one or two waves of assessments.

For the non-ODD group, the missing data of study variables were less than 12% (3.8–9.4%, 7.9–11.3%) at T1 and T2, less than 27% (22.5–26.4%) at T3. Of the 265 families who participated at T1, 249 (93.96%) participated at T2, and 193 (72.83%) families participated at T3. Attrition analyses revealed that except for children's and parents' age, $t_{\text{children}}(260) = 5.81$, $t_{\text{mother}}(253) = 2.87$, $t_{\text{father}}(255) = 2.94$, $ps < .05$ (children and parents were order in families that completed three waves of assessments), there were no

significant differences in demographic variables and main study variables between families who completed three waves of data and those failing to participate in all the three waves.

We conducted MCAR (missing completely at random) test to examine whether the missing data patterns were random. Results showed that for the ODD group, the missing data pattern is inclined not to be completely at random for three waves ($\chi^2 = 549.79$, $df = 497$, $p = 0.051$). Therefore, maximum likelihood estimation with robust standard errors (MLR) was used to handle missing data in our analysis [44].

Analytic Plan

First, we conducted Chi-square (χ^2) tests and independent-samples T Tests to examine demographic differences between the ODD and non-ODD groups. Second, repeated-measures analyses of covariance (ANCOVAs) were conducted to examine whether the study variables significantly differed over time between the ODD group and the non-ODD group. The children's diagnostic status was dummy coded (i.e., those children with ODD were coded as 1 and the non-ODD group was coded as 0) and entered along with children's gender and age, parents' age and education, and family monthly income as covariates. Next, correlations between the three dimensions of parenting stress and parental depressive symptoms were examined separately for the ODD and non-ODD groups.

In order to examine the longitudinal and bidirectional relationships between parenting stress and parental depressive symptoms, we conducted cross-lagged models separately for the ODD and non-ODD groups. Children's gender and age, parents' age and education, and family monthly income were included as covariates for parental depressive symptoms and three dimensions of parenting stress at all time points. Cross-lagged models were conducted using Mplus version 7.0 [45]. Model fit criteria used in the present study were chi-square statistic (χ^2), the comparative fit index (CFI), the root mean square error of approximation (RMSEA). Model fit was considered acceptable when the values of χ^2 were not significant or a ratio of χ^2/df < 3.0, CFI > 0.90, RMSEA < 0.08, and SRMR < 0.08 [46].

In order to formally test whether there were significant differences in the associations between parenting stress and depressive symptoms between parents of children with and without ODD, we conducted multi-group analysis based on the cross-lagged model with the whole sample. Specifically, we compared a model with the twelve paths (i.e. path a–l; Path "a" to "f" represented the effects of parental depressive symptoms to three dimensions of parenting stress, and path "g" to "l" represented the effects of three dimensions of parenting stress to parental depressive symptoms) coefficients constrained to equality with one that had those paths coefficients freely estimated across groups, using chi-square difference tests [46].

Results

Demographic Differences

Chi-square (χ^2) tests of significance and independent-samples T Tests were conducted to identify demographic differences between ODD and non-ODD groups (Table 1). There were more boys in the ODD group than in the non-ODD group ($\chi^2 = 21.56$, $p < 0.001$). ODD children were slightly older than their non-ODD peers, $t = 3.34$, $p < 0.001$. Parents of children with ODD were younger than those of children without ODD, $t = -3.12$, $p < 0.01$; $t = -1.90$, $p = 0.06$, for paternal and maternal age respectively. Compared with non-ODD group, fewer parents of children with ODD obtained a degree of junior college or higher, $\chi^2(1) = 7.63$, $p < 0.01$; $\chi^2(1) = 5.75$, $p < 0.05$, for paternal and maternal education respectively. Parents of children with ODD also reported less monthly income, $\chi^2(1) = 8.38$, $p < 0.01$.

Descriptive Analyses and Correlations

Descriptive characteristics and the correlations among observed variables are presented in Tables 1 and 2, respectively. Results from ANVOCA indicated that there was no significant difference in parental depressive symptoms as a function of child ODD status, $F(1, 1, 267) = 1.95$, $p = 0.16$. Parents from lower-income families and parents with boys reported higher parental depressive symptoms, (Fs > 4.72, ps < 0.05). The effects of child age, parents' age and education were not significant (Fs < 1.54, ps > 0.05).

For the subscale of Parental Distress, the main effect of child ODD status was significant, $F(1, 1, 309) = 7.19$, $p < 0.05$. Specifically, parents of children with ODD experienced more parental distress. The effects of child age and gender, parents' age and education and family monthly income were not significant (Fs < 3.65, ps > 0.05). For the subscale of Parent–Child Dysfunctional Interaction, the main effects of child ODD status, gender and maternal education were significant (Fs > 4.75, ps < 0.05). Mothers with lower education levels and parents of boys with ODD reported more Parent–Child Dysfunctional Interaction. The effects of child and parents' age, paternal education and family monthly income were not significant (Fs < 2.43, ps > 0.05). For Difficult Child, the main effect of child ODD status and gender were significant (Fs > 7.24, ps < 0.05). Parents with boys with ODD reported higher stress related to Difficult Children. The effects of child age, parents' age and education and family monthly income were not significant (Fs < 3.15, ps > 0.05).

Table 1 Group differences among study variables for ODD group and non-ODD

Variable	ODD group (n = 256) % or M (SD)	Non-ODD group M (SD) (n = 265) % or M (SD)	Statistical test
Child			
Boy	72.3	52.8	$\chi^2 = 21.56^{***}$
Age	9.60(1.57)	9.14(1.55)	$t = 3.34^{***}$
Caregiver			
Paternal age	38.43(5.16)	39.82(4.74)	$t = -3.12^{**}$
Maternal age	36.66(4.29)	37.35(3.82)	$t = -1.90^{\dagger}$
Paternal education (junior college or more)	61.6	73.2	$\chi^2 = 7.63^{**}$
Maternal education (junior college or more)	56.6	67.1	$\chi^2 = 5.75^{*}$
Monthly income (10,000 RMB or more)	26.0	39.2	$\chi^2 = 8.38^{**}$
Observed variables			
T1 PD**	33.56(7.41)	31.70(7.22)	
T2 PD**	32.66(7.72)	30.51(7.49)	
T3 PD**	32.50(7.89)	29.98(7.79)	
T1 PCDI***	28.01(7.65)	24.76(6.97)	
T2 PCDI***	27.47(7.74)	24.00(7.30)	
T3 PCDI***	28.37(8.91)	24.37(7.96)	
T1 DC***	33.90(8.69)	28.81(8.32)	
T2 DC***	31.77(8.84)	27.74(7.90)	
T3 DC***	32.51(9.53)	27.02(8.43)	
T1 DS	10.07(7.61)	8.00(6.41)	
T2 DS	9.71(7.88)	7.68(6.84)	
T3 DS	10.13(9.51)	8.16(6.87)	

ODD means oppositional defiant disorder; "T1, T2, T3" indicate that data were collected in the first year, in the second year, and in the third year

χ^2 means Chi-square test, *t* means independent-samples T Tests. children's gender and age, parental age and education, family monthly income are controlled in the repeated-measures ANCOVAs covariance analysis, not shown

PD parental distress, *PCDI* parent–child dysfunctional interaction, *DC* difficult child, *DS* parental depressive symptoms

$^{\dagger}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

For the ODD group, significant positive correlations were observed between the three dimensions of parenting stress and parental depressive symptoms (*p*s < 0.05), except for the correlations between Parental Distress at T2 and parental depressive symptoms at T3, and between parental depressive symptoms at T1 and Parental Distress at T3. For the non-ODD group, three dimensions of parenting stress and parental depressive symptoms were significantly associated with each other at T1, T2 and T3 (*p*s < 0.01).

Longitudinal Relations Between Parenting Stress and Parental Depressive Symptoms

Results from cross-lagged analysis with parents of children with ODD were presented in Figure 2. The model demonstrated adequate fit to the data (χ^2 (28) = 89.87, $p < 0.001$; CFI = 0.95; RMSEA = 0.07; SRMR = 0.05). Results revealed that parent–child dysfunctional interaction at T1 was associated with more parental depressive symptoms at T2, although the association was marginally significant (β = 0.18, SE = 0.09, $p = 0.06$); parent–child dysfunctional interaction at T2 significantly predicted parental depressive symptoms at T3 ($\beta = 0.23$, SE = 0.10, $p < 0.05$). In addition, parental depressive symptoms at T2 predicted higher parenting distress ($\beta = 0.19$, SE = 0.08, $p < 0.05$), parent–child dysfunctional interaction ($\beta = 0.25$, SE = 0.07, $p < 0.001$), and difficult child ($\beta = 0.20$, SE = 0.07, $p < 0.001$) at T3.

Results from analysis with parents of children without ODD were presented in Fig. 3. The model also demonstrated adequate fit to the data ($\chi^2(28) = 95.71$, $p < 0.001$; CFI = 0.96; RMSEA = 0.08; SRMR = 0.06). Consistent with results for the ODD group, parent–child dysfunctional interaction at T1 was associated (albeit marginally significant) with more parental depressive symptoms at

Table 2 Correlations among observed variables for parents of children with and without ODD

	1	2	3	4	5	6	7	8	9	10	11	12
1. T1 PD	–	0.58**	0.48**	0.64**	0.50**	0.48**	0.49**	0.42**	0.40**	0.45**	0.41**	0.35**
2. T1PCDI	0.62**	–	0.74**	0.50**	0.64**	0.54**	0.38**	0.57**	0.53**	0.46**	0.44**	0.43**
3. T1 DC	0.57**	0.73**	–	0.45**	0.53**	0.62**	0.40**	0.52**	0.63**	0.36**	0.36**	0.22**
4. T2 PD	0.48**	0.31**	0.30**	–	0.66**	0.61**	0.55**	0.42**	0.50**	0.37**	0.50**	0.30**
5. T2PCDI	0.46**	0.52**	0.50**	0.67**	–	0.76**	0.46**	0.61**	0.59**	0.43**	0.50**	0.45**
6. T2 DC	0.40**	0.38**	0.54**	0.47**	0.64**	–	0.44**	0.54**	0.62**	0.37**	0.48**	0.38**
7. T3 PD	0.32**	0.19*	0.10	0.19*	0.14	0.13	–	0.69**	0.68**	0.43**	0.42**	0.42**
8. T3PCDI	0.27**	0.33**	0.33**	0.19*	0.34**	0.25**	0.68**	–	0.79**	0.40**	0.38**	0.48**
9. T3 DC	0.18*	0.26**	0.28**	0.14	0.19*	0.31**	0.62**	0.70**	–	0.33**	0.42**	0.36**
10. T1 DS	0.54**	0.49**	0.43**	0.22**	0.33**	0.31**	0.15	0.21**	0.23**	–	0.51**	0.53**
11. T2 DS	0.32**	0.31**	0.28**	0.39**	0.44**	0.39**	0.22**	0.30**	0.23**	0.48**	–	0.52**
12. T3 DS	0.42**	0.32**	0.27**	0.15	0.29**	0.18*	0.52**	0.57**	0.53**	0.47**	0.35**	–

Correlations in top of diagonal are for parents of children without ODD, in bottom for parents of children with ODD

"T1, T2, T3" indicate that data were collected in the first year, in the second year, and in the third year

DS depressive symptoms, *PD* parental distress, *PCDI* parent-child dysfunctional interaction,*DC* difficult child

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

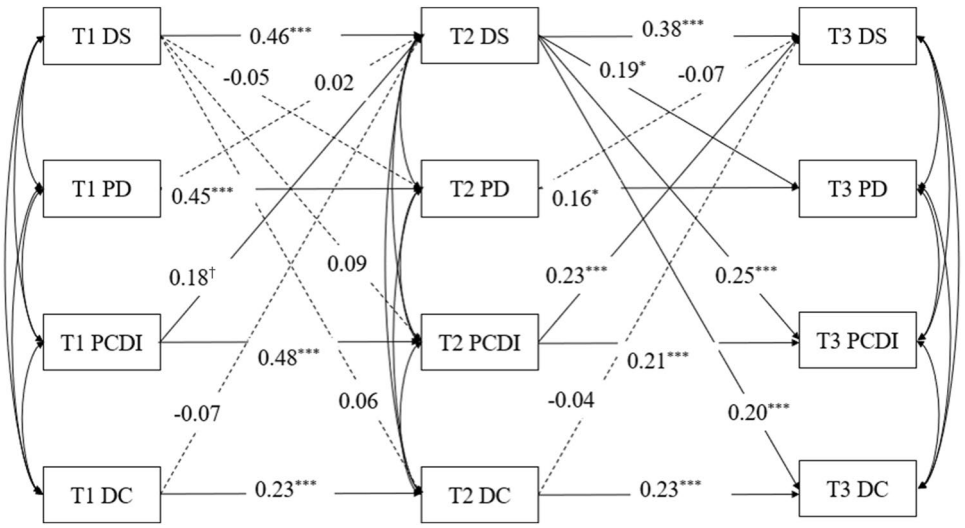

Fig. 2 The longitudinal linkages between three dimensions of parenting stress and parental depressive symptoms in ODD group. "T1, T2, T3" indicate that data were collected in the first year, in the second year, and in the third year. *DS* depressive symptoms, *PD* parental distress, *PCDI* parent–child dysfunctional interaction, *DC* difficult child. Control variables that include children's gender and age, parental age and education, and family monthly income are controlled in the model (not shown). All the coefficients are standardized estimates. Solid lines indicate significant paths and dotted lines indicate non-significant paths. Curve represent covariance correlation and straight lines represent direct effect. †$p < 0.10$, *$p < 0.05$,**$p < 0.01$,***$p < 0.001$

T2 ($\beta = 0.17$, SE = 0.09, $p = 0.06$); parent–child dysfunctional interaction at T2 significantly predicted more parental depressive symptoms at T3 ($\beta = 0.34$, SE = 0.11, $p < 0.01$). Furthermore, parental depressive symptoms at T1 significantly predicted all three dimensions of parenting stress at T2, including higher parental distress ($\beta = 0.15$, SE = 0.06, $p < 0.01$), parent–child dysfunctional interaction ($\beta = 0.22$, SE = 0.06, $p < 0.001$), and difficult child ($\beta = 0.27$, SE = 0.06, $p < 0.001$). Similarly, parental depressive symptoms at T2 also significantly predicted all three dimensions of parenting stress at T3 (parental distress: $\beta = 0.23$, SE = 0.07, $p < 0.01$; parent–child dysfunctional interaction: $\beta = 0.16$, SE = 0.07, $p < 0.05$; difficult child: $\beta = 0.20$, SE = 0.07, $p < 0.01$).

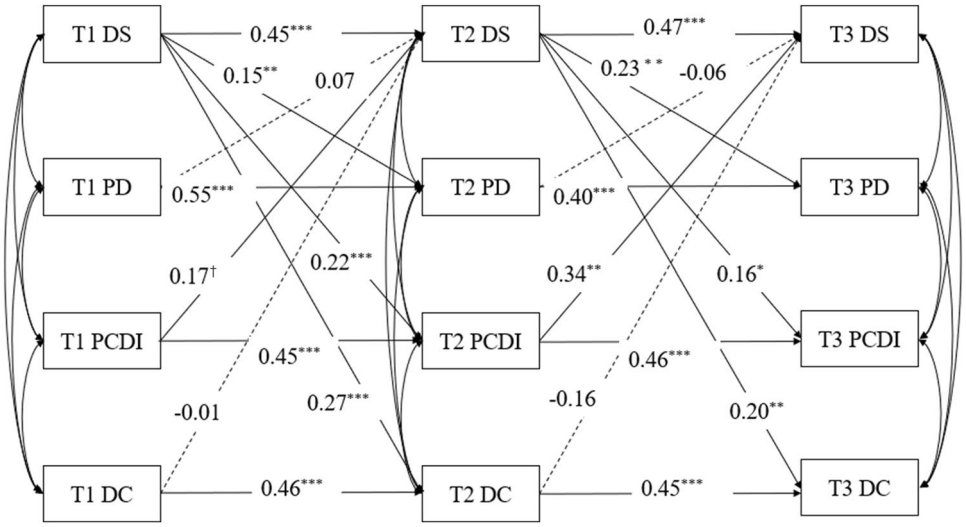

Fig. 3 The longitudinal linkages between three dimensions of parenting stress and parental depressive symptoms in non-ODD group. "T1, T2, T3" indicate that data were collected in the first year, in the second year, and in the third year. *DS* depressive symptoms, *PD* parental distress, *PCDI* parent–child dysfunctional interaction, *DC* difficult child. Control variables that include children's gender and age, parental age and education, and family monthly income are controlled in the model (not shown). All the coefficients are standardized estimates. Solid lines indicate significant paths, and dotted lines indicate non-significant paths. Curve represent covariance correlation and straight lines represent direct effect. $^{\dagger}p < 0.10$, $^{*}p < 0.05$,$^{**}p < 0.01$, $^{***}p < 0.001$

Multiple-Group Comparisons

We conducted multigroup analysis to examine whether there were significant differences in the path coefficients of the cross-lagged model between the ODD group and the non-ODD group. First, an unconstrained model that allowed the twelve paths (i.e. path a-l; Path "a" to "f" represented the effects of parental depressive symptoms to three dimensions of parenting stress, and path "g" to "l" represented the effects of three dimensions of parenting stress to parental depressive symptoms) estimates to vary among ODD and non-ODD group was estimated. This model fit the data well, $\chi^2(56) = 185.58$, CFI = 0.96, RMSEA = 0.08, SRMR = 0.05.

Next, a constrained model that constrained the parameter estimates of twelve paths for ODD and non-ODD group to be equal was estimated. If this constrained model resulted in a statistically significant decrement of model fit (χ^2) in comparison to the unconstrained model, then the pattern of associations could be assumed to vary for ODD and non-ODD group. This model revealed a good fit for the data, $\chi^2(68) = 196.94$, CFI = 0.96, RMSEA = 0.08, SRMR = 0.06.

Results indicated that the model constraining the twelve paths coefficients to be equal across the ODD and non-ODD groups did not fit significantly worse than the model with these twelve path coefficients freely estimated across groups ($\Delta\chi^2 = 11.36$, $\Delta\, df = 12$, $p > 0.05$), suggesting that the longitudinal associations between parenting stress and depressive symptoms were similar across the two groups.

Discussion

The current study extended the existing research on the relation between specific dimensions of parenting stress (i.e., parental distress, parent–child dysfunctional interaction and difficult child) and parental depressive symptoms by using a longitudinal, cross-lagged design and including parents of children with and without ODD. As expected, compare to parents of children without ODD, parents of children with ODD experienced higher levels of parenting stress over time. The result was consistent with previous studies illustrating that the amount of stress parents experienced might be a function of both parent and child attributes [7, 8]. We also found that the directionality of the association between parenting stress and parental depressive symptoms vary across the dimensions of parenting stress. Specifically, we found unidirectional relations of depressive symptoms predicting parental distress and difficult child and bidirectional relations between parent–child dysfunctional interaction and depressive symptoms in both ODD and non-ODD groups. These findings extended Beck's model of depression [20] and Abidin's parenting stress model [7] by suggesting that different dimensions of parenting stress have different relations with parental depressive symptoms. Although parents of children with ODD experienced more parenting stress compared to parents of children without ODD, the pattern of the associations between parenting stress and parental depressive symptoms did not differ as a function of child ODD status.

As hypothesized, parents of children with ODD experienced higher level of parental distress, parent–child dysfunctional interaction and difficult child than parents of children without ODD. This result was in line with the family stress model [46, 47]. That is, compared to typically developing children, emotional and behavioral symptoms of children with ODD may create considerable tension and burden on the family [48], which in turn contribute to more parenting stress [49]. The emotional and behavioral symptoms of ODD also may increase caretaking demand for parents throughout childhood [1, 3, 5], which can disrupt the normal parenting process and increase parenting stress [17, 50]. Interestingly, parental depressive symptoms were similar between parents of child with and without ODD, which was not consistent with our hypothesis. This result suggests that, in our sample of Chinese families, parents of children with ODD experienced more parenting stress but not parental depressive symptoms. The result highlighted the urgent need to decrease parenting stress for parents of children with ODD.

Our findings indicated that for both ODD and non-ODD groups, the links between parental depressive symptoms and parental distress and difficult child were unidirectional. That is, there was a cross-lagged effect for earlier parental depressive symptoms predicting later parental distress and difficult child, after controlling for demographic variables, but parental distress and difficult child did not predict parental depressive symptoms. This finding is consistent with the depression-distortion theory, which posits that people with depression are more likely to perceive the environment from a distorted perspective. If parents are depressed, they may experience more distress and perceive their child as difficult [51]. The results provide empirical support for theoretical frameworks of depression-distortion theory in a sample of Chinese families.

Nevertheless, the relationship between parental depressive symptoms and parent–child dysfunctional interaction was bidirectional in both groups. According to family systems theory [52], family is comprised of interactive and interdependent subsystems, such as parent–child dyads and parent/child individuals. Specifically, stress fueled by parent–child dysfunctional interaction (on a dyadic level) may have adverse impact on the mental health (i.e. parental depressive symptoms) of parents (on an individual level), due to spillover effects between the parent–child and individual parent subsystems within the family. In turn, the effect of individual parental depressive symptoms may directly spillover to parent–child dysfunctional interaction [19]. These dynamic and reciprocal effects suggested that early interventions aimed at reducing dysfunctional interactions between parents and children may play an important role in decreasing parental depressive symptoms.

It's worth noting that, only parent–child dysfunctional interaction, but not parental distress or difficult child have direct relation with parental depressive symptoms. Parental distress and difficult child reflect parents' perception of their own parenting role and child characteristics, whereas parent–child dysfunctional interaction represents parents' perception of their parent–child interactions [7, 8]. Because of the dynamic characteristic of parent–child interaction, the stress of parent–child dysfunctional interaction would be more crucial and predominant than stress related to parent's general perception of their parenting role and child characteristic [10]. Therefore, parent–child dysfunctional interaction had direct effect on parental depressive symptoms. These findings further developed Abidin's parenting stress model [8] by illustrating that the links between parenting stress and parental depressive symptoms depend on the specific dimension of parenting stress. Understanding such different longitudinal relations could also contribute to future intervention strategies.

Results from multigroup analysis indicated that there was no significant difference regarding to the magnitude of longitudinal relations linking parenting stress to subsequent depressive symptoms or vice versa between the two groups. The lack of differences between the two groups in our study could be due to that the percentages for ODD diagnosis in the ODD group were 48.8% and 42.7% for T2 and T3 respectively. A decreasing proportion of children with ODD may lead to a similarity in the intensity of the links between parenting stress and parental depressive symptoms between the two groups. Alternatively, the lack of differences between the two groups could be due to the unique cultural characteristics of Chinese families. Within the Chinese cultural context, parents highly value their children's performance and achievements and feel responsible for children's development [35]. This is particularly relevant in single-child families, which represent the majority of families in the current study. For parents of children with ODD, the oppositional defiant behavior may be mistakenly perceived as exuberant outward expressions, and thus parents may be more tolerant of and less likely to consider their children as problematic [53–55]. This phenomenon may be more pronounced in the present sample for most of the participating children with ODD are boys and defiant behavior is relatively common in boys [53, 56, 57]. Thus, although parents of children with ODD were more vulnerable to parenting stress than parents of children without ODD, the patterns of the relation between specific dimension of parenting stress and parental depressive symptoms were similar across groups.

Our findings need to be interpreted in light of several limitations of the current study. First, the non-ODD group was not demographically matched to the ODD group. This mismatch may influence the interpretations of findings. It is possible that differences in parenting stress and parental depressive symptoms between the two groups were in part due to this mismatch of demographic variables, even

though we controlled for these demographic variables in our analysis. Future research requires more careful matching of demographic variables across groups. Second, we were not able to examine whether patterns of relationships differ across parent gender and child gender, as well as parent–child gender-specific dyads given limitations of sample sizes within subgroups. Future studies with larger samples are needed to examine whether these effects are different in different parent–child dyads.

Even with the limitations, our findings demonstrated longitudinal associations between parenting stress and depressive symptoms among Chinese parents of children with and without ODD. The findings that parents of children with ODD reported more parenting stress than the comparison group highlighted the urgent need to provide effective strategies for parents of children with ODD to manage children's ODD symptoms. Our study further supports the parenting stress theory [8] by demonstrating that the relations between different dimensions of parenting stress and depressive symptoms were different. Researchers and practitioners should focus on different points when it comes to practice. That is, early interventions should be directed at reducing stress of dysfunctional interactions between parents and children in both groups, which may help decrease the level of parental depressive symptoms; more attention should be paid to reducing parental depression symptoms later, which may be conducive to Parental Distress and Difficult Child. Timely intervention of parenting stress and parental negative emotions could contribute to healthy development of parents.

Summary

The current study examined the longitudinal associations between three dimensions of parenting stress (i.e., parental distress, parent–child dysfunctional interaction, and difficult child) and parental depressive symptoms from a sample of Chinese parents of children with or without ODD. Results indicated that parents of children with ODD suffered higher level of parenting stress. For both groups, the links between parental depressive symptoms and subsequent parental distress and difficult child were unidirectional. While the relation between parental depressive symptoms and parent–child dysfunctional interaction was bidirectional. Multigroup analysis found that there was no significant difference regarding to the magnitude of relations between parenting stress and depressive symptoms between two groups. These findings highlighted the importance of understanding the longitudinal relations between specific dimensions of parenting stress and depressive symptoms. The study underscored that practitioners should provide targeted and timely education or intervention for parents regardless of children with or without ODD.

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Compliance with Ethical Standards

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

Ethical Approval Prior to conducting the study, the Institutional Review Board of Beijing Normal University in China approved the research protocol, including the consent procedure. 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.

References

1. American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders, 5th edn. American Psychiatric Association, Washington, DC
2. Cunningham CE, Boyle MH (2002) Preschoolers at risk for attention-deficit hyperactivity disorder and oppositional defiant disorder: family, parenting, and behavioral correlates. J Abnorm Child Psychol 30(6):555–569. https://doi.org/10.1023/a:1020855429085
3. Li L, Lin X, Hinshaw SP, Du H, Qin S, Fang X (2017) Longitudinal associations between oppositional defiant symptoms and interpersonal relationships among Chinese children. J Abnorm Child Psychol 7(2):C–15. https://doi.org/10.1007/s10802-017-0359-5
4. Tseng WL, Kawabata Y, Gau SSF (2011) Social adjustment among Taiwanese children with symptoms of ADHD, ODD, and ADHD comorbid with ODD. Child Psychiatry Hum Dev 42(2):134–151. https://doi.org/10.1007/s10578-010-0204-3
5. Hamilton SS, Armando J (2008) Oppositional defiant disorder. Am Fam Physician 78(7):861–866
6. Burke JD, Pardini DA, Loeber R (2008) Reciprocal relationships between parenting behavior and disruptive psychopathology from childhood through adolescence. J Abnorm Child Psychol 36(5):679–692. https://doi.org/10.1007/s10802-008-9219-7
7. Abidin RR (1995) Parenting Stress Index: professional manual, 3rd edn. Psychological Assessment Resources, Odessa
8. Abidin RR (1992) The determinants of parenting behavior. J Clin Child Psychol 21(4):407–412. https://doi.org/10.1207/s15374424jccp2104_12
9. Reitman D, Currier RO, Stickle TR (2002) A critical evaluation of the parenting stress index-short form (PSI-SF) in a head start population. J Clin Child Adolesc Psychol 31(3):384. https://doi.org/10.1207/S15374424JCCP3103_10

10. Gordon CT, Hinshaw SP (2017) Parenting stress and youth symptoms among girls with and without attention-deficit/hyperactivity disorder. Parenting 17(1):11–29. https://doi.org/10.1080/15295192.2016.1262178
11. Harvey EA, Breaux RP, Lugo-Candelas CI (2016) Early development of comorbidity between symptoms of attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD). J Abnorm Psychol 125(2):154–167. https://doi.org/10.1037/abn0000090
12. Kashdan TB, Jacob RG, Pelham WE, Lang AR, Hoza B, Blumenthal JD et al (2004) Depression and anxiety in parents of children with ADHD and varying levels of oppositional defiant behaviors: Modeling relationships with family functioning. J Clin Child Adolesc Psychol 33(1):169–181. https://doi.org/10.1207/S15374424JCCP3301_16
13. Lin X, Li Y, Zhang Y, He J, Fang X, Psychology DO (2015) The association of parent's parenting stress and children's oppositional defiant symptoms: a longitudinal study. Stud Psychol Behav (Chin) 13(2):153–161
14. Liu X, Lin X, Heath MA, Zhou Q, Ding W, Qin S (2018) Longitudinal linkages between parenting stress and oppositional defiant disorder (ODD) symptoms among Chinese children with ODD. J Fam Psychol 32(8):1078–1086. https://doi.org/10.1037/fam0000466
15. Wymbs BT, Dawson AE, Egan TE, Sacchetti GM, Tams ST, Wymbs FA (2017) ADHD and depression symptoms in parent couples predict response to child ADHD and ODD behavior. J Abnorm Child Psychol 45(3):471–484. https://doi.org/10.1007/s10802-016-0220-2
16. Johnston C, Mash EJ (2001) Families of children with attention-deficit/hyperactivity disorder: Review and recommendations for future research. Clin Child Fam Psychol 4(3):183–207. https://doi.org/10.1023/a:1017592030434
17. Harrison C, Sofronoff K (2002) ADHD and parental psychological distress: role of demographics, child behavioral characteristics, and parental cognitions. J Am Acad Child Adolesc Psychiatry 41(6):703–711
18. Chronis AM, Lahey BB, Pelham WE, Kipp HL, Baumann BL, Lee SS (2003) Psychopathology and substance abuse in parents of young children with attention-deficit/hyperactivity disorder. J Am Acad Child Adolesc Psychiatry 42(12):1424–1432. https://doi.org/10.1097/00004583-200312000-00009
19. Lin X, Zhang Y, Chi P, Ding W, Heath MA, Fang X et al (2017) The mutual effect of marital quality and parenting stress on child and parent depressive symptoms in families of children with oppositional defiant disorder. Front Psychol 8:1810. https://doi.org/10.3389/fpsyg.2017.01810
20. Beck AT (1976) Cognitive therapy and the emotional disorders. Meridian, New York
21. Thomason E, Volling BL, Flynn HA, Mcdonough SC, Marcus SM, Lopez JF et al (2014) Parenting stress and depressive symptoms in postpartum mothers: bidirectional or unidirectional effects? Infant Behav Dev 37(3):406–415. https://doi.org/10.1016/j.infbeh.2014.05.009
22. Farmer AY, Lee SK (2011) The effects of parenting stress, perceived mastery, and maternal depression on parent–child interaction. J Soc Serv Res 37(5):516–525. https://doi.org/10.1080/01488376.2011.607367
23. Ye KM, Dong-Young P (2009) Parenting stress, depression and verbal abuse of infant's mothers. Child Health Nurs Res 15(4):375–382. https://doi.org/10.4094/jkachn.2009.15.4.375
24. Salloum A, Stover CS, Swaidan VR, Storch EA (2014) Parent and child PTSD and parent depression in relation to parenting stress among trauma-exposed children. J Child Fam Stud 24(5):1203–1212. https://doi.org/10.1007/s10826-014-9928-1
25. Cornish AM, Mcmahon CA, Ungerer JA, Barnett B, Kowalenko N, Tennant C (2006) Maternal depression and the experience of parenting in the second postnatal year. J Reprod Infant Psychol 24(2):121–132. https://doi.org/10.1080/02646830600644021
26. Patton SR, Dolan LM, Smith LB, Thomas IH, Powers SW (2011) Pediatric parenting stress and its relation to depressive symptoms and fear of hypoglycemia in parents of young children with type I diabetes mellitus. J Clin Psychol Med Settings 18(4):345–352. https://doi.org/10.1007/s10880-011-9256-1
27. Secco ML, Askin D, Yu CT, Garinger J, Mulaire-Cloutier C, Scharf L et al (2006) Factors affecting parenting stress among biologically vulnerable toddlers. Issues Compr Pediatr Nurs 29(3):131–156. https://doi.org/10.1080/01460860600846867
28. Steijn DJV, Oerlemans AM, Aken MAGV, Buitelaar JK, Rommelse NNJ (2014) The reciprocal relationship of ASD, ADHD, depressive symptoms and stress in parents of children with ASD and/or ADHD. J Autism Dev Disord 44(5):1064–1076. https://doi.org/10.1007/s10803-013-1958-9
29. Casalin S, Luyten P, Besser A, Wouters S, Vliegen N (2014) A longitudinal cross-lagged study of the role of parental self-criticism, dependency, depression, and parenting stress in the development of child negative affectivity. Self Identity 13(4):491–511. https://doi.org/10.1080/15298868.2013.873076
30. Horowitz JA, Goodman J (2004) A longitudinal study of maternal postpartum depression symptoms. Res Theory Nurs Pract 18(2–3):149. https://doi.org/10.1891/rtnp.18.2.149.61285
31. Whalen CK, Henker B (1999) The child with attention-deficit/hyperactivity disorder in family contexts. Handbook of disruptive behavior disorders, Springer, New York
32. Pritchard MA, Colditz PB, Cartwright D, Gray PH, Tudehope D, Beller E (2012) Six-week postnatal depression predicts parenting stress profiles in mothers of preterm children. J Reprod Infant Psychol 30(3):303–311. https://doi.org/10.1080/02646838.2012.710832
33. Cohen LL, Vowles KE, Eccleston C (2010) The impact of adolescent chronic pain on functioning: disentangling the complex role of anxiety. Eur J Pain 11(11):1039–1046. https://doi.org/10.1016/j.jpain.2009.09.009
34. Lerner RM, Spanier GB (eds) (2013) Child influences on marital and family interaction: a life-span perspective. Academic Press, New York, NY
35. Ng FFY, Pomerantz EM, Deng C (2014) Why are Chinese mothers more controlling than American mothers? "My child is my report card". Child Dev 85(1):355–369. https://doi.org/10.1111/cdev.12102
36. Wang Z, Guo D (2003) Review of Gross's research on emotion regulation process and strategy. Adv Psychol Sci (Chin) 11(06):629–634
37. Matsumoto D, Yoo SH, Nakagawa S (2008) Culture, emotion regulation, and adjustment. J Personal Soc Psychol 94(6):925–937. https://doi.org/10.1037/0022-3514.94.6.925
38. National Health and Family Planning Commission of the PRC (2015) China family development report 2015. China Population Publishing House, Beijing, China
39. Chang SSY, Ng CFN, Wong SN (2002) Behavioral problems in children and parenting stress associated with primary nocturnal enuresis in Hong Kong. Acta Paediatr 91(4):475–479. https://doi.org/10.1080/080352502317371742
40. Hu X, Han ZR, Bai L, Gao MM (2019) The mediating role of parenting stress in the relations between parental emotion regulation and parenting behaviors in Chinese families of children with autism spectrum disorders: a dyadic analysis. J Autism Dev Disord 49:3983–3998. https://doi.org/10.1007/s10803-019-04103-z

41. Yeh CH, Chen ML, Li W, Chuang HL (2001) The Chinese version of the parenting stress index: a psychometric study. Acta Paediatr 90(12):1470–1477. https://doi.org/10.1080/08035250152708914
42. Radloff LS (1977) The CES-D scale. Appl Psychol Meas 1(3):385–401. https://doi.org/10.1177/014662167700100306
43. Li Z, Hicks MH (2010) The CES-D in Chinese American women: construct validity, diagnostic validity for major depression, and cultural response bias. Psychiatry Res 175(3):227–232. https://doi.org/10.1016/j.psychres.2009.03.007
44. Enders CK (2010) Applied missing data analysis. Guilford Press, New York
45. Muthén LK, Muthén BO (2012) Mplus User's Guide, 7th edn. Muthén and Muthén, Los Angeles, CA
46. Hu LT, Bentler PM (1999) Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct Equ Model 6(1):1–55. https://doi.org/10.1080/10705519909540118
47. Boss P (2001) Family stress management. Sage, Newbury Park, CA
48. Christenson JD, Crane DR, Malloy J, Parker S (2016) The cost of oppositional defiant disorder and disruptive behavior: a review of the literature. J Child Fam Stud 25:2649–2658. https://doi.org/10.1007/s10826-016-0430-9
49. Patterson J (1988) Families experiencing stress: the family adjustment and adaptation response model. Fam Syst Med 5:202–237. https://doi.org/10.1037/h0089739
50. Anastopoulos AD, Shelton TL, Dupaul GJ, Guevremont DC (1993) Parent training for attention-deficit hyperactivity disorder: its impact on parent functioning 21(5):581–596. https://doi.org/10.1007/bf00916320
51. Gartstein MA, Bridgett DJ, Dishion TJ, Kaufman NK (2009) Depressed mood and maternal report of child behavior problems: Another look at the depression-distortion hypothesis. J Appl Dev Psychol 30:149–160. https://doi.org/10.1016/j.appdev.2008.12.001
52. Cox MJ, Paley B (1997) Families as systems. Annu Rev Psychol 48:243–267. https://doi.org/10.1146/annurev.psych.48.1.243
53. Loeber R, Burke JD, Lahey BB (2000) Oppositional defiant and conduct disorder: a review of the past 10 years. J Am Acad Child Adolesc Psychiatry 39(12):1468–1484. https://doi.org/10.1097/00004583-200012000-00007
54. Liu Y, Li Z, Lin X, Fan T (2015) The parenting styles for children with oppositional defiant disorder and their impact on the symptoms: a qualitative analysis. Chin J Spec Educ 1:55–62
55. Valle PD, Kelley SL, Seoanes JE (2001) The "oppositional defiant" and "conduct disorder" child: a brief review of etiology, assessment, and treatment. Behav Dev Bull 10(1):36–41. https://doi.org/10.1037/h0100481
56. Kann RT, Hann FJ (2000) Disruptive behavior disorders in children and adolescents: how do girls differ from boys. J Couns Dev 78(3):267–274. https://doi.org/10.1002/j.1556-6676.2000.tb01907.x
57. Ding W, Lin X, Su J, Jiang Y, Wu Q, He T (2019) The mutual influence between marital quality and child oppositional defiant disorder symptoms in Chinese families: do child and parent's gender matter? J Child Fam Stud 28:2086–2097. https://doi.org/10.1007/s10826-019-01408-6