



The role of parental conflict in predicting adolescent depression symptoms during the COVID-19 pandemic: A longitudinal study

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Abstract

The present study was designed to investigate the association and the underlying mechanism between parental conflict and adolescent depression during the COVID-19 pandemic. In a longitudinal study, a total of 655 Chinese adolescents ranging from 13 to 16 years old completed a three-wave survey (W1, W2, W3) via a survey website. The data was collected three times: March 15–20, 2020 (W1, the outbreak period of the COVID-19 pandemic in Mainland China), June 20–25, 2020 (W2, the trough stage), and December 15–20, 2020 (W3, six months after the trough stage). The SPSS 16.0 software was used to investigate the relationships among study variables. The findings showed that a double-hump effect was found for depression detection among adolescents during the pandemic, with depression rates in W1 (26.9%) and W3 (29%) were higher than that in W2 (21.9%). The parental conflict subscales of content and resolution had a greater impact on adolescent adjustment than other subscales. The parental conflict had direct and indirect impacts (through reducing family support and increasing burdensomeness) on adolescent depression symptoms in W3. It was concluded that when the COVID-19 pandemic was in a trough curve for more than six months, adolescent adjustment was significantly impacted by the pandemic, and parental conflict was an important risk factor in predicting individual adjustment. Therefore, family intervention is recommended when improving adolescent adjustment during the COVID-19 pandemic.

Keywords Depression · Parental conflict · Adolescent · Family support · Burdensomeness · COVID-19 pandemic

Introduction

During the COVID-19 pandemic outbreak, people who lived in infected areas often experienced physical or mental health problems (Shek, 2020), especially for adolescents due to

their critical periods of interpersonal development, education, and career-building (Lee et al., 2020). The impact of the pandemic on adolescents may be changed as time is ongoing. However, most research regarding the impact of the COVID-19 pandemic on adjustment are qualitative studies or quantitative studies based on cross-sectional design (Griffith, 2022; Li et al., 2020), which is not able to depict the development of psychological symptoms related to the pandemic. In addition, family conflicts, including parental conflict might increase under the stay-at-home order in which all family members were asked to stay at home (Amran, 2022; Chung et al., 2022; Girolamo et al., 2020; Marroquín et al., 2020). Compared with parental conflict occurring under normal circumstances, parental conflict during the pandemic might have larger negative consequences on adolescent adjustment because the adolescents do not have a chance to escape from their parents under the stay-at-home order. The association between parental conflict and adolescent adjustment exists in literature (e.g., Wang et al., 2016), however, the underlying mechanism between them is still not clear. Therefore, these researchers found it necessary to investigate

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the association between parental conflict and adolescent adjustment during the pandemic, and how it occurred.

Since all citizens in mainland China were required to stay at home, parental conflict increased related to children rearing practices, imposed financial stress (Liu et al., 2020), and difficulty with adolescent online learning, etc. (Shek et al., 2021). Previous research indicates that parental conflict is an important family influencing factor, and might harm adolescent adjustment from different perspectives (Krishnakumar & Buehler, 2000; Mueller et al., 2015; Niziurski & Schaper, 2021; Wang et al., 2014). For example, emotional security theory (Cummings et al., 2014; De Silva et al., 2021) asserts that when adolescents are exposed to their parents' conflict, they feel vulnerable about the stability of their family relationships, and tend to preserve their emotional insecurity within their familial relationships by manifesting various psychopathological symptoms related to this conflict such as displaying an emotional problem. Other research indicates that parental conflict has a negative impact on children's adjustment to adults through transferring the negative inter-adult emotion (Bradford et al., 2008) or the negative perceptions of their parents (Grych & Fincham, 1990). Therefore, it is reasonable to propose that parental conflict is positively related to adolescent depression during the pandemic. In addition, according to Grych et al. (2010), parental conflict is a multidimensional variable that is measured by several subscales, including frequency, self-blame, threat, triangulation, coping efficacy, resolution, and content. However, in most research, the association between parental conflict and adolescent adjustment, parental conflict was measured by a total score of the whole scale rather than subscales (Bradford et al., 2008; Hayatbakhsh et al., 2013; Nam & Maxwell, 2020). The measurement of parental conflict with total scores is not able to provide the relative impact of parental conflict subscales on adolescent adjustment, which might limit the practical implication of the findings.

In general, parental reaction and adolescent evaluation of parental conflict cannot be neglected when discussing the association between parental conflict and adolescent adjustment. Wang et al. (2014) assert that cognitive appraisal or emotional security may independently mediate the path from parental conflict to adolescent internal problems. On one hand, frequent conflicts may be emotionally draining and reduce parental ability to recognize and respond to their children's emotional needs (Hsieh et al., 2017). Krishnakumar and Buehler (2000) assert that parental conflict is associated with children's adjustment through decreased parent involvement and support, and more verbal criticism and physical punishment (Bradford et al., 2008). Considering the important role of parents in the adolescents' perception of family support, it is reasonable to hypothesize that parental conflict might have an indirect impact on adolescent adjustment through decreasing family support. On the other hand,

when a child perceives that parental conflict is associated with them personally, they tend to blame themselves (e.g., have a feeling of burden for their family) which may place them at risk for future depression (Carrera & Wei, 2017; Gao et al., 2018; Shen et al., 2021). The Chinese culture of blaming is notable (Lieber et al., 2006; Qiao & Wang, 2018). Thus, the second hypothesis is proposed that parental conflict has an indirect impact on adolescent depression through decreasing family support and increasing the feeling of burdensomeness.

Therefore, a longitudinal study was conducted with the following aims. The first aim was to investigate the incidence of adolescent depression symptoms when the pandemic epidemiology curve was in a trough. The second aim was to discuss the relationship between parental conflict and adolescent depression symptoms, especially the relative impact of subscales of parental conflict on adolescent depression symptoms. The third aim was to discuss the mediators of family support and burdensomeness in the association between parental conflict and adolescent depression. This study has important implications for educators or family members to improve adolescent adjustment during the COVID-19 pandemic and provide a basis for subsequent interventions.

Methods

Participants and procedures

Nearly 800 adolescents from four secondary schools in mainland China were asked to participate in a survey during the COVID-19 pandemic. With the help of the head teachers, three-wave data was collected via a survey website (www.wjx.cn). The data was collected three times: March 15–20, 2020 (W1, the outbreak period of the COVID-19 pandemic in Mainland China), June 20–25, 2020 (W2, the trough stage, a period when the COVID-19 was generally under control in China; lower than 10 newly confirmed cases in China per day), and December 15–20, 2020 (W3, six months after the trough stage, less than 10 newly confirmed cases in China per day, and most being from abroad). Each participant had a unique identification number. Of all the 800 potential participants, 720 (90.1%), 702 (87.8%), and 660 (82.6%) subjects participated in a website survey at W1, W2, and W3, respectively. The survey from participants who did not complete the three-wave survey or left 15% of items unanswered, were excluded from the study, leaving a total of 655 student surveys for analysis. Among the final sample, 338 (51.6%) were males, 384 (58.6%) were eighth grade students and 271 (41.4%) were ninth grade students. Participants were between 13 and 16 years old, with an average age of $M = 14.37$, $SD = 0.66$. One-way ANOVA showed that

no significant differences were found for studied variables (e.g., parental conflict) between those participants who took part in three-wave surveys and those who only took part in W1, but not W2 or W3. This study was conducted under the approval of the moral and ethical committee of the School of Psychology, Jiangxi Normal University, and with written informed consent from the student's parents or guardians.

Measurement

Perceived parental conflict Children's Perception of Interparental Conflict Scale (CPIC) (Grych et al., 2010) was used to measure adolescent perceived CPIC worldwide. Zhao and Mo (2006) translated the CPIC into Chinese and developed the Chinese version of the Children's Perception of Interparental Conflict Scale (C-CPIC) for adolescents. The C-CPIC has been proved with good reliability and validity in measuring perceived parental conflict among Chinese adolescent samples (Yang & Wang, 2011), and was used to measure adolescents' parental conflict in W1 in the present study. The C-CPIC consists of 38 items with the seven subscales: frequency (e.g., "I never see my parents arguing or disagreeing."), attribution of conflict (e.g., "My parents quarrel because they do not like each other."), threat (e.g., "I get scared when my parents argue"), triangulation (e.g., "I have to take sides when my parents disagree."), coping efficacy (e.g., "When my parents argue, there is nothing I can do to stop them."), resolution ("When my parents disagree about something, they usually come up with a solution."), and content ("My parent's arguments are usually about some things that I do."). Participants were asked to rate each question on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). High scores indicate that an adolescent perceives his/her parental conflict with high frequency, negative attribution of conflict, high threat, high triangulation, low coping efficacy, unresolved conflict, and more adolescent-related conflict content. The mean score for the whole parental conflict scale was also computed by calculating the mean score of all items, in which a high score means perceived high parental conflict. In the present study, the Cronbach alpha scores of seven sub-scales ranged from 0.76 to 0.87, and the Cronbach alpha score of the parental conflict scale is 0.94. The score below (or above) the median score of parental conflict was characterized as a low (or high) level of parental conflict.

Depression The brief Patient Health Questionnaire (PHQ-9) (Xiong et al., 2015) was used to measure the depression symptoms among adolescents in W1-W3. The participants were asked to respond on a 4-point scale (0 = not at all, 3 = nearly every day), with a higher score indicating higher symptoms of depression. Scores of 5, 10, and 15 represent the threshold for mild, moderate, and (moderately) severe

depression symptoms. Participants who had scores of 5 and above, and below 5 were characterized as having and not having depression symptoms respectively. The Cronbach alpha scores of the PHQ-9 at W1-W3 in the present study were 0.91, 0.90, and 0.88, respectively.

Family support and burdensomeness Compared with multiple-item scales, single-item measures may have an advantage in predicting individual emotion or behavior (e.g., may have better face validity, with validity as high as that of multiple-item scales) (Nagy, 2002). In the present study, burdensomeness was measured by one item adapted from Oosterhoff et al.'s study (2020), "Please rate the extent to which you currently felt like a burden to the family" on a 7-point scale from 1 (not at all) to 7 (extremely). A higher score means greater feelings of burdensomeness. Family support was measured by one item "Please rate the extent of the satisfaction of the support received from your family" on a 5-point scale from 1 (very dissatisfied) to 5 (very satisfied) (Li et al., 2020). Higher scores indicate greater satisfaction with the support from family members. Both the variables of family support and burdensomeness were measured in W2. The score below (or above) the median score was characterized as a low (or high) level of burdensomeness or perceived family support.

Demographic variables In the present study, some demographic variables were collected in W1 and W3, including gender (male or female), grade (seventh grade, eighth grade, and ninth grade), and parental educational level. Participants were asked to report the education level of their parents based on a 6-point Likert scale ranged from 1 (primary school or below) to 6 (postgraduate or above). The score of the father's or mother's education level equal to or below 3 (or above 3) was characterized as a low (or high) parental education level.

Data analysis

First, frequency and percentage were calculated for adolescent depression symptoms in W1-W3. Second, the nonparametric Mann-Whitney U test was applied to compare the depression symptoms by the group. In terms of the level of burdensomeness, perceived family support, and parental conflict, the score below (or above) the median score was characterized as a low (or high). Third, the logit regression model (Liu et al., 2013) was used to analyze the relative impact of parental conflict on adolescent depression in W1-W3, and the mediating role of family support and burdensomeness between parental conflict and depression in W3. In the logit regression model, depression is a dichotomous variable, in which zero is equal to non-depression symptoms, while one is equal to mild depression symptoms

or above. Family support and burdensomeness are ordinal variables, while the subscales of parental conflict or the total score of parental conflict are continuous variables. The reported Confidence Intervals (CIs) were calculated at the 95% level and statistical significance was set at the 5% level. SPSS 16.0 software was used to analyze the data. In addition, depression in W1 and some demographic variables (e.g., gender, grade) were regarded as the covariates, as they are shown to have a significant impact on individual depression symptoms in previous research (e.g., Lee et al., 2020).

Results

Descriptive analysis

Of the 655 adolescents included in the analysis, the detection rates of depression at W1-W3 are 26.9%, 21.9%, and 29%, respectively. Table 1 showed that female students, higher grade students (ninth grade), and adolescents with low parental education levels were more likely to report depression symptoms in three waves except for the variables of gender, and parental education level in W1. In addition, adolescents with high parental conflict, low family support, and high perception of burdensomeness tended to report more depression symptoms in W3.

The relative impact of each parental conflict subscale on adolescent depression symptoms in W1-W3

Logical regression was used to investigate the relative impact of each parental conflict subscale on adolescent depression symptoms in W1-W3. Results (see Table 2) showed that only the subscales of the resolution were significantly positively related to adolescent depression symptoms in three waves ($P_s < 0.05$), and the positive impact of contents on depression was found in W1 and W3 after controlling other parental conflict subscales ($P_s < 0.05$).

The mediating roles of family support and burdensomeness

To test the mediating role of family support and burdensomeness in the relation between parental conflict (the mean score of all parental conflict scale items) and depression in W3, the approach for the ordinal outcome variable proposed by Liu et al. (2013) was used. In the first step, the logit regression model was used to investigate the predicting role of parental conflict on adolescent depression symptoms in W3. In the second step, an accumulative logistic regression model was used to analyze the predicting role of parental conflict on family support or burdensomeness. In the third

Table 1 Demographic characteristics of the adolescents by depression symptoms in W1-W3

Characteristic	Total (%)	Depression in W1			Depression in W2			Depression in W3		
		None (%)	Having mild or above (%)	<i>p</i>	None (%)	Having mild or above (%)	<i>p</i>	None (%)	Having mild or above (%)	<i>p</i>
Observations	655(100)	479 (73.1)	176 (26.9)		508 (78.1)	143 (21.9)		465 (71.0)	190 (29.0)	
Gender				> .10 ^a			< .01 ^a			< .01 ^a
Male	308 (52.5)	233(75.6)	75(24.4)		257(83.7)	50(16.3)		235(76.3)	73(23.7)	
Female	279 (47.5)	200(71.7)	79(28.3)		203(73.3)	74(26.7)		186(66.7)	93(33.3)	
Grade				< .05 ^a			< .05 ^a			< .05 ^a
Eighth grade	364 (57.0)	272(74.7)	92(25.3)		292(80.9)	69(19.1)		274(75.3)	90(24.7)	
Ninth grade	275 (43.0)	194(70.5)	81(29.5)		203(74.1)	71(25.9)		182(66.2)	93(33.8)	
Parental education				> .10 ^a			> .10 ^a			< .01 ^a
Low	260 (39.7)	186 (71.5)	74 (28.5)		202 (78.0)	57 (22.0)		166 (63.8)	94 (36.2)	
High	395 (60.3)	293 (74.2)	102 (25.8)		306 (78.1)	86 (21.9)		299 (75.7)	96 (24.3)	
Parental conflict				< .001 ^a			< .001 ^a			< .001 ^a
Low	327 (49.9)	259 (79.2)	68 (20.8)		276 (84.9)	49 (15.1)		263 (80.4)	64 (19.6)	
High	328 (50.1)	220 (67.1)	108 (32.9)		232 (71.2)	94 (28.8)		202 (61.6)	126 (38.4)	
Family support				————			< .001 ^a			< .001 ^a
Low	322 (49.3)	————	————		229 (71.1)	93 (28.9)		208 (64.6)	114 (35.4)	
High	332 (50.7)	————	————		279 (84.8)	50 (15.2)		256 (77.1)	76 (22.9)	
Burdensomeness				————			< .001 ^a			< .001 ^a
Low	326 (50.1)	————	————		274 (84.0)	52 (16.0)		256 (78.5)	70 (21.5)	
High	325 (49.9)	————	————		234 (72.0)	91 (28.0)		205 (63.1)	120 (36.9)	

^a Mann–Whitney U test

Table 2 The relative impact of each parental conflict subscale on adolescent depression symptoms in W1-W3

Characteristic	Depression in W1 (having or not having)			Depression in W2 (having or not having)			Depression in W3 (having or not having)		
	OR	95%CI	P	OR	95%CI	P	OR	95%CI	P
Frequency	1	(.97, 1.04)	.921	1	(.97, 1.04)	.923	1	(.97, 1.04)	.966
Attribution of conflict	.97	(.89, 1.05)	.407	1	(.93, 1.09)	.929	1.01	(.93, 1.08)	.883
Threat	1.08	(1.02, 1.15)	.007	1.04	(.98, 1.11)	.23	1.01	(.94, 1.06)	.928
Triangulation	1.01	(.93, 1.11)	.76	1.09	(.99, 1.19)	.085	1.08	(1.00, 1.18)	.05
Coping efficacy	1	(.92, 1.10)	.884	1.01	(.92, 1.11)	.856	1	(.92, 1.09)	.946
Content	1.06	(1.01, 1.10)	.01	1.01	(.96, 1.05)	.785	1.06	(1.01, 1.10)	.011
Resolution	1.07	(1.01, 1.12)	.022	1.05	(1.0, 1.11)	.05	1.06	(1.00, 1.12)	.038

step, the logit regression model was used to investigate the predicting role of family support and burdensomeness on adolescent depression symptoms in W3 after controlling parental conflict. The variables of gender, grade, parental education level, and depression in W1 were regarded as covariates in all regression models. Results (see Fig. 1) showed individuals who experienced more parental conflict reported more depression in W3 ($\beta=0.05$, $P < 0.001$) and burdensomeness ($\beta=0.25$, $P < 0.001$), and less family support ($\beta=-0.04$, $P < 0.05$). Both family support and burdensomeness were significantly related to depression in W3 (family support: $\beta=-0.31$, $P < 0.001$; burdensomeness: $\beta=0.18$, $P < 0.001$) after controlling other predictors. Sobel Z test showed that parental conflict has a significant positive indirect effect in predicting depression in W3 through decreasing family support (0.01, 95%CI=[0.001, 0.02]) and increasing burdensomeness (0.04, 95%CI=[0.02, 0.07]).

For covariates, results showed that students with more depression symptoms at W1 tended to report more depression symptoms in W3 ($OR = 1.07$, 95%CI=[1.03, 1.11]). Similar results were found in variables of gender, grade, and parental education. That is, students with high parental education level reported low depression symptoms in W3 ($OR = 0.60$, 95%CI=[0.41, 0.88]), while female students and high grade students reported high depression symptoms

in W3 (gender: $OR = 1.56$, 95%CI=[1.07, 2.28]; grade: $OR = 1.46$, 95%CI=[1.0, 2.14]).

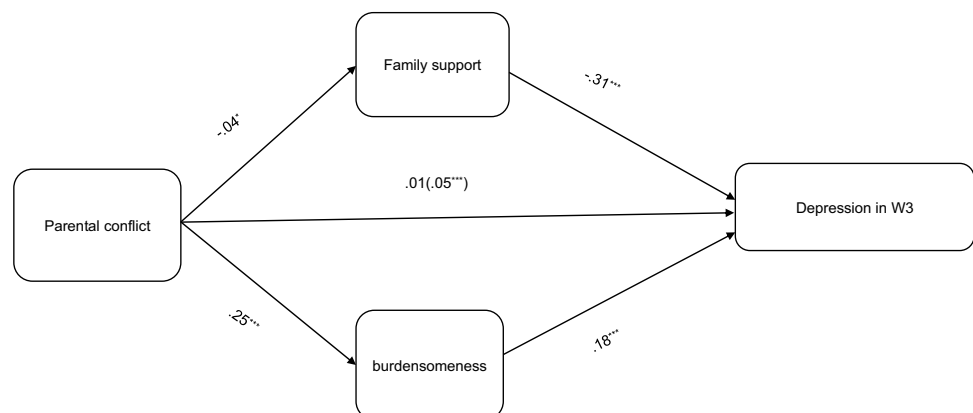
Discussion

The COVID-19 pandemic caused great suffering for people who lived in infected areas, and most of the research studies about the impact of the pandemic were conducted during the pandemic outbreak. As few studies investigated adolescent depression symptoms and its antecedents (e.g., parental conflict) when the pandemic was at the trough stage using a longitudinal study, these findings enrich the understanding of the impact of the COVID-19 pandemic on adolescent adjustment from the family perspective and help improve adolescent adjustment during the pandemic.

Adolescent depression symptoms of adolescents during the pandemic

A double-hump effect was found for depression detection among adolescents in W1-W3 during the pandemic, with the depression rates in W1 (26.9%) and W3 (29%) were higher than in W2 (21.9%). It contributed to the researcher's knowledge about the development of adolescent depression

Fig. 1 The direct and indirect effect of perceived interparental conflict on adolescent depression symptoms in W3. Note: All the logit regression coefficients are standardized according to the approach suggested by Liu et al. (2013); the regression coefficient in the parentheses indicates the direct impact of parental conflict on adolescent depression in W3



trajectory during the pandemic. The main reason for high adolescent depression incidence in W1 was the pandemic, that is, all people were asked to stay at home or their outdoor activities were prohibited when the pandemic outbreak, which caused many emotion-related adjustment problems for people in infected areas. In W2, the pandemic was under the trough stage, in which the stay-at-home order was released and people can participate in some outdoor activities by taking some protective measures (e.g., wearing a mask when needed), which may be a benefit for adolescent adjustment. The interesting thing is that the prevalence of adolescent depression rate in W3 was higher than that of W2 and the finding of a meta-analysis of depression rate among adolescents (24.5%) (Tang & Wong, 2018). It indicates that adolescent students still experience high depression symptoms, even if the pandemic was at the trough stage lasting for more than six months. The enormous academic pressure might be the main reason for the higher prevalence of adolescent depression symptoms in W3. For Chinese adolescents, preparing for the senior secondary entrance examination and the college entrance examination are important events in their daily lives, and would cause enormous academic pressure for them, especially for students in higher grade levels such as students in grade nine (Tang et al., 2019). Many adolescents experienced poor learning outcomes in the process of online learning when schools were closed, which caused enormous academic stress for adolescents and put them at a high risk of depression. Changing daily life might be another important reason for adolescent depressive symptoms. In December 2020, although the ratio of people infected with disease was reduced (e.g., less than 10 newly confirmed cases in China per day and most of them are from abroad), individuals' activities were still restricted due to the fear of being sick, or the substantial changes of daily routine (e.g., wearing a mask when participating in outdoor activities) (Jeong, 2021). In addition, adapting to a new learning environment (e.g., the time of parental accompany reduced) might be a challenge for some students when stay-at-home order was released.

The association between parental conflict and adolescent depression symptoms

The positive relationship between parental conflict and adolescent depression symptoms supported the risk factor of parental conflict on adolescent adjustment (Christ & Gray, 2022; Deng et al., 2012; Lee et al., 2015; Wang et al., 2014). It indicates that adolescents who witness more parental conflict might report more depression symptoms. The present study contributed to the existing literature by investigating the relative impact of the specific subscale of parental conflict on adolescent adjustment. Results showed that only the subscale of (adolescent-related) content, and resolution (unresolved conflict) can predict adolescent depression in

two of three waves. The larger impact of unsolved parental conflict could be explained by the theory of hope, in which unsolved conflict might strengthen the negative impact of conflict on psychological function through decreasing hope for a future happy life (Kanter et al., 2021). The larger impact of (adolescent-related) content could be explained by conflict involvement theory, in which children's feelings of involvement in the parental conflict were important predictors of psychological functioning (Bannon et al., 2017; Gager et al., 2016). The culture of blame in China (Lieber et al., 2006; Qiao & Wang, 2018) might be another reason for the impact of the (adolescent-related) content subscale of parental conflict on adolescent adjustment. In contrast, the significant impact of each parental conflict scale on adolescent depression was not found for the subscale of frequency, threat, and attribution of conflict, except for the subscale of threat in W1. On one hand, it might be related to Chinese adolescent participants, who tend to be sensitive to the evaluation by significant others (e.g., parents), and their adjustment is easily affected by adolescent-related parental conflicts (Yang et al., 2002). On the other hand, adolescents have developed a cognitive adaptation under frequent conflict circumstances (Lynn, 2010), which may reduce the impact of the subscale of frequency on adolescent adjustment. The mediating role of family support and burdensomeness contributes to the literature about the relationship between parental conflict and adolescent adjustment by providing an interpretation of how the process occurred. That is, parent conflict has an indirect impact on adolescent depression by reducing family support and increasing burdensomeness during the pandemic.

The impact of covariate variables on adolescent depression symptoms

Female students, students at the higher grade level, or students with lower parental education levels or more depression in W1 tended to report more depression symptoms. The positive impact of depression in W1 on depression in W3 supported the view of persistent characteristics of depression, which indicates that early depression symptoms are a risk factor for following depression in W3. Consistent with previous research (Li et al., 2020), women tend to report higher depression symptoms than male students during the pandemic. The possible reason might be that women tend to be more sensitive to external threats due to biological factors (Nandrino et al., 2013). Academic pressure might be the main reason for the impact of grade variables on adolescent depression. The senior secondary entrance examination is often regarded as one of the important issues for Chinese adolescents. Ninth grade students might experience more academic pressure than eighth grade students because ninth grade is the last crucial year for the senior secondary

entrance examination (Tang et al., 2019). In addition, parental education level is a predictor of adolescent adjustment during the pandemic. The possible reason might be that parents with higher education levels tend to respond positively to adolescent (emotional) needs and have more resources in dealing with potential challenges during the pandemic, which are beneficial for individual adjustment (Frick et al., 2014).

Limitations

Several limitations of the present study should be noted. Firstly, the sample bias should be considered when interpreting these findings because the sample used in the present study only included adolescents from four secondary schools in mainland China. Secondly, although the present study found that social support and burdensomeness might mediate the association between parental conflict and depression, other mediators (e.g., parental-adolescents conflict) were not investigated. Third, previous research shows that parental marital problems might have a significant impact in predicting adolescent internalized problems (Cui et al., 2007), while the reverse is also true. Future research should investigate the reciprocal association between parental conflict and adolescent depression during the pandemic, using the cross-over design study.

Clinical implication

This study made a unique contribution to the literature by examining the association and the underlying mechanism between parental conflict and depression during the pandemic. These findings have several implications for educators or counselors in improving adolescent adjustment during the pandemic. First, the high prevalence of adolescent depression in W3 indicates that the negative impact of the pandemic on adolescent adjustment is continued even when the pandemic was at a trough stage lasting for more than six months. It suggested that some adjustment-related policies should be provided for adolescents to improve their mental health during the post-COVID-19 pandemic. Second, given that parental conflict is common, the parental conflict subscale of (adolescent-related) content, and resolution have a relatively larger impact on adolescent depression than other subscales. It suggests that parents should minimize children's involvement in conflicts and find the solution to the conflict if the parental conflict cannot be stopped. Third, the mediating role of family support and burdensomeness suggests that the negative impact of parental conflict on adolescent adjustment could be minimized by increasing children's perception of family support and reducing the feeling of burdensomeness. In addition, more attention should be paid to vulnerable groups such as female students,

high-grade students, students with lower parental education levels, or students with early depression symptoms in W1 during the pandemic.

Conclusions

Although the COVID-19 pandemic was at a trough stage lasting for more than six months in mainland China, the impact of the pandemic on adolescent adjustment is continued. As one of the important risk family influencing factors, the parental conflict has a direct and indirect impact (through reducing family support and increasing burden) on adolescent adjustment. In addition, gender difference, grade difference, and parental education level differences were found in predicting adolescent depression symptoms. These findings above have implications for education counselors or family members in improving adolescent adjustment during the pandemic.

Authors' contributions The authors alone are responsible for the writing and content of this article. The data were collected by LX, WM, ZX, and SP. LX drafted the manuscript, while WM, ZX, LM, SP critically reviewed and revised it. All authors read and approved the final manuscript.

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Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. Approval was obtained from the moral and ethical committee of the School of Psychology, Jiangxi Normal University, with written informed consent from the participants' parents or guardians.

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

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