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## Perceived family adaptability and cohesion and depressive symptoms: A comparison of adolescents and parents during COVID-19 pandemic

Mengxue Li<sup>a, #</sup>, Lili Li<sup>a, #</sup>, Feng Wu<sup>a</sup>, Yang Cao<sup>b</sup>, Huanrui Zhang<sup>c</sup>, Xin Li<sup>d</sup>, Jie Zou<sup>e</sup>, Zhongwu Guo<sup>f</sup>, Lingtao Kong<sup>a, \*</sup>

<sup>a</sup> Department of Psychiatry, The First Affiliated Hospital of China Medical University, Shenyang 110001, Liaoning, China

<sup>b</sup> Shenyang Mental Health Center, Shenyang 110168, Liaoning, China

<sup>c</sup> Department of Clinical Epidemiology, The First Affiliated Hospital of China Medical University, Shenyang 110001, Liaoning, China

<sup>d</sup> Education Research Institute of Huanggu District, Shenyang 110030, Liaoning, China

<sup>e</sup> Education Research Institute of Sujiatun District, Shenyang 110100, Liaoning, China

<sup>f</sup> Education Service Center of Kangping County, Shenyang 110500, Liaoning, China

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### ABSTRACT

**Objective:** To compare the differences of depressive symptoms and perceived family cohesion and adaptability between adolescents and parents during the pandemic; to explore the association between depressive symptoms and family cohesion and adaptability.

**Methods:** A total of 8,940 adolescents (45.77% males; Mean age=15.31±0.018 years old) and their parents (24.34% males; Mean age=40.78±0.60 years old) from Shenyang, Liaoning Province, China, participated in the survey and completed several questionnaires online. We used the Patient Health Questionnaire-9 (PHQ-9) and the Family Adaptability Cohesion Scale, Second Edition, Chinese version (FACES II-CV) to evaluate depressive symptoms and family cohesion and family adaptability from the perception of parents and adolescents.

**Results:** Results indicated significant differences between adolescents' and parents' perspectives of family functions. Significant negative correlations exist between depressive symptoms and family cohesion and family adaptability from the perspectives of both adolescents and parents. In addition, regression models with demographic characteristics adjusted showed that the perceived family cohesion and adaptability of parents and adolescents and the agreements between them could be predicted by their depressive symptoms.

**Limitation:** Cross-sectional study and limited population-wide are limitations.

**Conclusion:** Detecting the depressive symptoms of adolescents and parents earlier and promptly providing family intervention are of great significance to promote their perceptions of family cohesion and adaptability, which contribute to the mental health development of adolescents and parents during the COVID-19 pandemic.

### 1. Introduction

COVID-19 has spread around the world (DS et al., 2020). By September 2020, 25.59 million people worldwide had been infected with COVID-19, and more than 850,000 had died, thus causing worry and panic that lead to psychological problems, including anxiety and depression (EPH et al., 2020; T et al., 2020). Global disasters, such as war and epidemics, often trigger emotional and mental health problems among the population (RG et al., 2006; X et al., 2012). To prevent the spread of the pandemic, the Chinese government has encouraged people

to be home quarantined, which has led to emotional changes among adolescents and parents (SK et al., 2020; X et al., 2012).

Adolescence is a high-risk period for depression (Kessler et al., 2012). During this stage, depressed parents have a significant impact on the generation of adolescent depression (DS et al., 2013; L et al., 2019). Adolescents with parents who have been depressed have more depressive symptoms and more communication difficulties than adolescents without such parents (C et al., 2003). Similarly, parents' mental health can also be affected by their adolescents' depressive symptoms, which can further cause anxiety, and depression (BW et al., 2020). More

\* Corresponding author. Department of Psychiatry, The First Affiliated Hospital of China Medical University, 155 Nanjing North Street, Shenyang 110001, Liaoning, China

E-mail address: [ltkong@cmu.edu.cn](mailto:ltkong@cmu.edu.cn) (L. Kong).

# Mengxue Li and Lili Li contributed to this study equally.

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interpersonal problems have been reported in such situations (EW et al., 2020). Additionally, family environment also has a significant impact on the mental health of adolescents. In general, most adolescents have a positive relationship with their family (JG et al., 2006). A previous study suggested that the higher their family function is, the higher the self-esteem of adolescents will be (Shi et al., 2017). Additionally, research showed that family conflicts increase during adolescence (Montemayor, 1983). At this point, the adolescent's perception of family cohesion decreases (Ohannessian et al., 2000; Steinberg and Morris, 2001). A study by Freed et al. demonstrated that family function can affect an individual's emotional regulation, which is related to the etiology of depression (RD et al., 2016). Recent studies have found that family dysfunction has been put forward as one of the environmental mechanisms whereby the risk of depression is transmitted from parents to their children. For instance, Yeh found that family function is the mediator between maternal depression and the positive and negative emotions of the adolescents (Yeh et al., 2016). Daches suggested that parental depression can be passed on to children through poor family function (S et al., 2018). Therefore, family function may play an important role in the interaction of the negative emotion among the family. The Olson circumplex model is one of conceptual models frequently applied to explain family function (DH et al., 1983). It includes two dimensions: family cohesion and family adaptability. Family cohesion is defined as "the emotional bonding that couple and family members have towards one another." Family adaptability is defined as "the amount of change in leadership, role relationships, and relationship rules" (Olson, 2000). This two family dimensions illustrate the individuals' dependence on family members and their adaptability to the family. Of the three family types, which is divided by family cohesion and family adaptability, the balanced type is the most ideal family type, and the extreme type is the worst (Olson, 2000).

Some studies have suggested that family members may have different perspectives of family cohesion and family adaptability from one another. For example, Ohannessian believed that adolescents and mothers have varying views on their family cohesion and adaptability, which are linked to higher levels of adolescent internalizing symptomatology (CM and A, 2014). J. Carola Pérez's research indicated that mothers perceive their family as more cohesive and more adaptable than their children (JC et al., 2018). At present, research on the influence of discrepancy in family functions between adolescents and their parents mainly lies in their characteristics and social conditions. For instance, Korelitz and Garber (2016) conducted a meta-analysis and found that discrepancy in family dimensions between adolescents and parents are significantly correlated with children's age, race, clinical status, and family intactness (KE and J, 2016). In addition, mental health problems may also be a cause of discrepancy between adolescents' and parents' perspectives of family function. Wang reported that mothers' depressive symptoms are positively correlated with the partner's view on family cohesion and adaptability (Wang and Zhou, 2015). However, researchers have not specifically examined the relationship between adolescents' and parents' discrepancies in perceiving family cohesion and adaptability and depressive symptoms.

Therefore, our main hypothesis are as follows. (1) Adolescents and parents differ in their perspectives of family cohesion and family adaptability. (2) The depressive symptoms of adolescents and parents interact with each other. (3) Depressive symptoms in adolescents and parents are both associated with poorer family function. (4) Depressive symptoms in adolescents and parents affect both perceptions of family cohesion and family adaptability. The purpose of the study is to assess the association between depressive symptoms and family cohesion and adaptability, taking into account the perspectives of adolescents and their parents. The study also explores the discrepancy between adolescents and parents during the COVID-19 pandemic.

## 2. Methods

### 2.1. Measurement

#### 2.1.1. Basic information questionnaires

The researchers collected data through online questionnaires, which included some questions regarding demographic characteristics, such as the grade of adolescents, gender, age, educational level, annual income, marriage, work of parents, previous emotional problems or insomnia, and some information related to the pandemic. A total of 8,940 adolescents and their parents from Shenyang, Liaoning Province, China participated in the survey between February and March 2020, when quarantine had been adopted as a key public health measure to support the control of the Coronavirus disease (COVID-19) pandemic. Several questionnaires were completed by teenagers and their parents. The Family Adaptability Cohesion Scale was used to evaluate family function. The Patient Health Questionnaire-9 was used to assess the severity of the depressive symptoms. Excluding invalid results, a total of 8,483 questionnaire results were collected, among which 5,723 were from families whose children were middle school students, and 2,762 were from families whose children were high school students. All participants had signed an electronic informed consent, which was reviewed and approved by the ethics committee of China Medical University.

#### 2.1.2. Family Adaptability Cohesion Scale, Second Edition, Chinese version. FACES II-CV

The Family Adaptability Cohesion Scale, Second Edition, Chinese version (FACES II-CV) (Fei et al., 1991) is a self-assessment scale used to evaluate family function. It includes two dimensions: family cohesion and family adaptability. Family cohesion refers to the degree of emotional connection among individuals in a family. Adaptability refers to the stability of the family structure and function when the family environment changes. The scale consists of 30 questions, 15 of which are related to family cohesion. These items can be divided into four types according to scores: connected, separated, disengaged, and enmeshed. The other 15 questions are related to family adaptability, which can be divided into four types according to the score: chaotic, structured, flexible, and rigid. Thus, FACES II-CV is suitable within the Chinese context and has good validity (Phillips et al., 1998) (Wen et al., 2018).

#### 2.1.3. Patient Health Questionnaire-9

The Patient Health Questionnaire-9 (PHQ-9) is a scale used to assess the severity of the depressive symptoms (Kroenke et al., 2010). It is very sensitive in recognizing depressive symptoms (Martin et al., 2006). The scale has a total of nine items. Each item has four options, and the score ranges from 0 to 3. The total score is the sum of the scores obtained from the nine items. A total score of 0–4 indicates that the participants have no depressive symptoms, while a score higher than 4 indicates the presence of depressive symptoms. The total score is no more than 27.

### 2.2. Statistical analyses

The demographics of the participants were described by descriptive statistics. SPSS 25 statistical software was used to conduct the statistical analysis. Chi-square test was used to evaluate the differences in family types and family function from the perspective of parents and adolescents. To compare the family cohesion and family adaptability from the perspective of adolescents and their parents and the differences in depressive symptoms during the epidemic, a paired t-test was performed, and the degree of consistency between adolescents and their parents was calculated by intraclass correlation coefficient (ICC) based on the bidirectional random effect model. Pearson correlation was conducted to analyze the relationship between adolescents' and parents' perceptions of family cohesion and adaptability and depression. Finally, researchers established the regression models with parents' and adolescent's depressive symptoms as the main independent variable to

study the predictive effects of depressive symptoms on family cohesion and family adaptability from the perspectives of adolescents and parents. Meanwhile, the differences in the scores of the family cohesion and family adaptability of adolescents and parents were also predicted.

### 3. Results

#### 3.1. Basic characteristics of study participants

Table 1 shows that 67.45% of the adolescent participants were from junior high school, 45.77% were male, and the mean ± standard deviation of age was 15.31±0.018. Among them, 57.80% were the only child in the family, and 6.54% had previously experienced emotional problems or insomnia. Among the parent participants, 23.24% were fathers. In addition, 7.40% of these participants graduated from primary school, 46.05% from junior high school, and 20.13% from senior high school. Meanwhile, 24.47% graduated from college, and 1.94% had a master's degree or above. Most of the parent participants were married (95.51%), 0.23% of parents were single. A small percentage were divorced (5.01%), and 1.24% had been widowed. An annual income below 20,000 yuan accounted for 24.01% of the parent participants, and an

**Table 1**  
Participants Characteristics

Part A adolescents		Part B. parents	
	Total N=8483		Total N=8483
Sex(male/female)	Male (45.77%)	Sex (male/female)	Male (24.34%)
Age(year)*	15.31±0.018	Age (year)	40.78±0.60
The only child of family	Yes (57.80%)	Education level	Primary (7.40%) Junior high school (46.05%) Senior high school (20.13%) College (24.47%) Above graduates (1.94%)
Grades	Junior high school (67.45%) Senior high school (33.55%)	Marriage	Married (93.51%) Single (0.23%) Divorced (5.01%) Widowed (1.24%)
Had emotion problems or insomnia before	None (90.46%) Yes (9.54%)	Annual income (yuan)	<20000 (24.01%) 20000-50000 (37.04%) 50000-100000 (25.78%) 100000-200000 (9.87%) >200000 (3.37%)
Depression symptoms	Yes (21.52%) No (78.48%)	Work	Return to work (33.26%) Vocation (56.63%) Work home (10.11%)
Anxiety symptoms	Yes (13.45%) No (86.55%)	Had emotion problems or insomnia before	None (92.30%) Yes (7.69%)
		Depression symptoms	Yes (12.64%) No(87.36%)
		Anxiety symptoms	Yes(12.73%) No (87.27%)

income between 20,000 yuan and 50,000 yuan accounted for 37.04%. An income ranging from 50,000 yuan to 100,000 yuan accounted for 25.78%, 100,000 yuan to 200,000 yuan accounted for 9.87%, and 3.37% of parents had an annual income higher than 200,000 yuan. Regarding parents' current working state, 33.26% of them had returned to work, 56.63% rest at home, and 10.11% work from home. Most of the parents did not previously experience emotional problems or insomnia (92.30%). According to our survey, during the quarantine period of the epidemic, more adolescents (21.52%) displayed depressive symptoms than their parents (12.64%), and adolescents (13.45%) also had more anxiety symptoms than their parents (12.73%).

#### 3.2. Differences in family types from the perspective of parents and adolescents

Table 2 shows the differences in family types from the perspective of parents and adolescents. During home quarantine, among adolescent-perceived family adaptability, rigid type accounted for the most recognized type (35.9%), followed by flexible and structured (23.6%, 24.4%, respectively). Chaotic type had the lowest proportion of adolescent perception (16.1%). Among parent-perceived family adaptability, the flexible type was rated the highest (29.0%). Next, structured and rigid types were rated at 28.5% and 23.9%, respectively. Similar to adolescent-perceived family adaptability, the chaotic type accounted for the least proportion (18.5%). The results of the study on family cohesion from the perspective of adolescents showed that the enmeshed type was the most prominent (45.3%). The separated type had the least proportion among the types (12.3%). These results were similar to the parents' perspective. Based on the analysis of family function types calculated by family cohesion and family adaptability scores, the family types from the perspective of adolescents were mainly midrange (50.3%), balanced (20.1%), and extreme (29.6%). Meanwhile, from the perspective of parents, the midrange type accounted for 53.8%, and the balanced type accounted for 20.9%. In addition, the extreme type accounted for 25.4%. The chi-square test found significant differences in family intimacy and adaptability and family functions from the perspective of adolescents and parents (p<0.001).

#### 3.3. Comparison between adolescent and parent perspectives of family cohesion and adaptability and depression

The means and standard deviations of parent and adolescent responses are displayed in Table 3. The scores of family cohesion (p<0.001) and adaptability (p<0.001) from the perspective of adolescents were lower than those of parents. The effect size ranged from 0.128 to 0.152. However, the scores of depressive symptoms were higher in adolescents than in parents (p<0.001), and effect size was -0.144. To explore the agreements between adolescents' and parents'

**Table 2**  
Difference of Family Types between Parents and Adolescents Perspectives.

	Adolescents N=8483	Parents N=8483	p
Adaptability			<0.001
Chaotic	1367(16.1%)	1573(18.5%)	
Flexible	2000(23.6%)	2464(29.0%)	
Structured	2072(24.4%)	2421(28.5%)	
Rigid	3044(35.9%)	2025(23.9%)	
Cohesion			<0.001
Separated	1041(12.3%)	444(5.2%)	
Disengaged	1718(20.3%)	1189(14.0%)	
Connected	1883(22.2%)	2028(23.9%)	
Enmeshed	3841(45.3%)	4822(56.8%)	
Family function			<0.001
Midrange	4263(50.3%)	4562(53.8%)	
Balanced	1705(20.1%)	1770(20.9%)	
Extreme	2515(29.6%)	2151(25.4%)	

**Table 3**  
Paired t test (2-tailed) of Comparison between Adolescent and Parent Perspectives

	Parent M(SD)	Adolescent M(SD)	Effect size	p	Intra-Class Correlation coefficient	p
Family adaptability	49.45±8.881	46.94±10.515	0.128	<0.001	0.308	<0.001
Family cohesion	72.47±10.222	69.09±11.962	0.152	<0.001	0.318	<0.001
Depression	1.51±3.073	2.61±4.355	-0.144	<0.001	0.139	<0.001

perceptions of family cohesion and adaptability and the depressive symptoms, ICCs were estimated. The results showed that adolescents and parents had the highest agreement on their perspectives of family cohesion (ICC=0.318), followed by family adaptability (ICC=0.308), and finally by depressive symptoms (ICC=0.139).

**3.4. Relationship between adolescents' and parents' perceptions of family cohesion and adaptability and depression**

To explore the relationship between depressive symptoms and family cohesion and family adaptability from the perspective of parents and adolescents, we conducted correlation analysis. These results are shown in Table 4. Part A showed a significant negative correlation between depressive symptoms and family cohesion and family adaptability from the perspective of adolescents (p<0.01). Part B showed a significant negative correlation between depressive symptoms and family cohesion and family adaptability from the perspective of parents (p<0.01). In Part C, family cohesion and family adaptability from the perspective of adolescents were positively correlated with that from the perspective of parents (p<0.01) but negatively correlated with parents' depressive symptoms (p<0.01). Depressive symptoms of adolescents were negatively correlated with family cohesion and family adaptability from their parents' perspective (p<0.01) and positively correlated with their parents' depressive symptoms (p<0.01).

Table 5.

**3.5. Regression models with parents' and adolescents' depressive symptoms as main independent variable**

To evaluate further the effect of depressive symptoms on family cohesion and family adaptability, we took the depressive symptoms of adolescents and parents as independent variables. We also used family cohesion and family adaptability from the perspective of parents and adolescents and the score difference between them as dependent variables to establish regression models. Demographic variables (sex, age, previous emotional problems, and having one child or not) had significant effects on family closeness and adaptability (p<0.01, not listed in the table). The following findings were determined when the variables were adjusted. (1) Severe depressive symptoms of parents were

**Table 4**  
Pearson Correlations

Part A adolescents' perceptions			
	Adaptability	Cohesion	Depression
Adaptability	1		
Cohesion	.840**	1	
Depression	-.320**	-.363**	1
Part B. parents' perceptions			
	Adaptability	cohesion	Depression
Adaptability	1		
Cohesion	.801**	1	
Depression	-.144**	-.179**	1
Part C. adolescents' and parents' perceptions			
	Parent perceptions		
adolescent perceptions	Adaptability	Cohesion	Depression
Adaptability	.309**	.264**	-.059**
Cohesion	.291**	.318**	-.068**
Depression	-.075**	-.088**	.134**

\*\*p<0.01

significantly associated with lower family adaptability and cohesion (p<0.001). (2) Severe depressive symptoms of parents were significantly associated with lower family adaptability and cohesion from the perspective of adolescents (p<0.001). (3) Mild depressive symptoms of parents were significantly associated with lower score difference between family cohesion and adaptability from the adolescents' and parents' perspective (p<0.001). (4) Severe depressive symptoms of adolescents were significantly associated with their lower family adaptability and cohesion (p<0.001). (5) Severe depressive symptoms of adolescents were significantly associated with lower family adaptability and cohesion from the perspective of parents (p<0.001). (6) Mild depressive symptoms of adolescents were significantly associated with high score difference between family cohesion and adaptability from adolescents' and parents' perspective (p<0.001). On the basis of the demographic variables adjusted in each regression model, we added the depressive symptoms of parents as the independent variable. Consequently, the adjusted R<sup>2</sup> increased significantly. Then, the depressive symptoms of adolescents were added as an independent variable, and the adjusted R<sup>2</sup> significantly increased again.

**4. Discussion**

The purpose of the study was to assess the association between depressive symptoms and family cohesion and adaptability by taking into account the perspectives of adolescents and their parents and exploring the discrepancies between these groups during the COVID-19 pandemic.

The results supported our main hypothesis. First, significant differences were observed between adolescents' and parents' perspectives of family cohesion and adaptability. The family type from the perspective of adolescents was more rigid, while their parents thought it was more flexible. The scores of family cohesion and adaptability from the perspective of adolescents were lower than those of parents. Meanwhile, adolescents and parents had the highest agreement on their perspectives of family cohesion, followed by family adaptability, and, finally, depressive symptoms. Then, we found a significant negative correlation between depressive symptoms and family cohesion and family adaptability from the perspective of adolescents and parents. Family cohesion and family adaptability from the perspective of adolescents (parents) were positively correlated with those from the perspective of parents (adolescents) but negatively correlated with the parents' (adolescents') perspective on the depressive symptoms of parents. In addition, the results showed that parents who scored high on their depressive symptoms also scored high on the symptoms of their children. Finally, regression models with adjusted demographic characteristics showed that the perceived family cohesion and adaptability of both parents and adolescents could be predicted by their depressive symptoms. Moreover, the higher the score of depressive symptoms of the parents was, the greater the difference between the parents and the adolescents in their views on family cohesion and adaptability would be. In contrast, the higher the score of depressive symptoms of the adolescents was, the smaller the difference would be.

Consistent with prior research, adolescents perceived more negative family cohesion and adaptability than parents (A and CM, 2016; CM and A, 2014; CR et al., 2014; JC et al., 2018; KE and J, 2016). Moreover, the higher the parental depressive symptoms were, the lower the adolescents' family cohesion would be. Thus, the more depressed the parents were, the more conflicts would occur in their relationship with



**Table 5**  
Regression Models with Parent and adolescent depression symptoms as Main Independent Variable

	Parents		Adolescents		Adolescent-Parent difference score	
	Adaptability Adjusted R <sup>2</sup> (B)	Cohesion Adjusted R <sup>2</sup> (B)	Adaptability Adjusted R <sup>2</sup> (B)	Cohesion Adjusted R <sup>2</sup> (B)	Cohesion Adjusted R <sup>2</sup> (B)	Adaptability Adjusted R <sup>2</sup> (B)
Demographic characteristics <sup>1</sup>	1.9%	2.4%	4.4%	5.9%	3.3%	2.2%
Parent's depression	3.3% (-.125***)	4.6% (-.154***)	4.6% (-.044***)	6.1% (-.048***)	3.8% (.077***)	2.5% (.057***)
Adolescent's depression	3.5% (-.050***)	4.9% (-.056***)	11.4% (-.288***)	14.6% (-.321***)	9.0% (-.250***)	6.6% (-.225***)

1: Demographic characteristics: parents and adolescents: sex, age, had emotion problems or insomnia before or not; the only child of family.

2: standardized regression coefficient shown.

\*\*\*: p<0.001

adolescents (Cummings and Davies, 1994). The parent-child relationship would be strained (Q et al., 2017), thus resulting in family dysfunction. Therefore, depressive symptoms could be transmitted from parents to adolescents through poor family function (Van Loon et al., 2014; Yeh et al., 2016). In addition to the family cohesion of adolescents, their family adaptability was also negatively correlated with parental depressive symptoms. Unlike our results, J. Carola Perez believed that family adaptability was not related to depressive symptoms (JC et al., 2018). This difference might be due to the gender or social and cultural differences of our participants and the way we processed data.

Our finding was consistent with Phillips's, as parents and adolescents were more consistent in their views of family cohesion than family adaptability (CR et al., 2014). This result could be related to the opinion that in the face of the COVID-19 pandemic, adolescents spent more time with their parents and felt closer to each other. However, parents often play a dominant role in family relationships (JG, 1995). Compared with teenagers, they have more confidence in family adaptability. Olson et al. suggested that differences between parent and adolescent ratings be analyzed separately as discrepancy scores (DH et al., 1983). Our results are consistent with previous research, as it showed that adolescent and parental depressive symptoms could predict perceived family function as well as the difference in family function between adolescents and parents (KE and J, 2016; SA et al., 2016). The more depressed the parents were, the greater the disagreement would be about family cohesion and adaptability between them and adolescents. Thus, the perceived family cohesion and adaptability of adolescents were negatively affected by parental depressive symptoms more than those of parents. However, we found that the more depressed the adolescents were, the less disagreement would occur regarding family cohesion and adaptability between them and parents. Thus, adolescents with higher levels of depression had less decline in their perception of family cohesion and adjustment compared with their parents.

This study has some limitations. First, we conducted a cross-sectional study that was unable to establish a causal relationship between family function and depressive symptoms. Further longitudinal studies are needed in the future to explore the relationship between family function and mental health disorders. Second, the results of our model were less predictive, thus suggesting that in addition to demographic characteristics and depressive symptoms in adolescents and parents, other factors that could affect family cohesion and adaptability have not been studied. Among such factors that need further investigation include the pressure of family environment (Sheidow et al., 2014), conflicts between parents (Montemayor, 1983), and communication between parents and adolescents (CR et al., 2014). Third, we only studied the family cohesion and adaptability and depressive symptoms of primary and middle school students and their parents in Shenyang. Thus, a larger population-wide study is needed.

## 5. Conclusion

Our findings suggested an association between family cohesion and adaptability and depressive symptoms among adolescents and parents

during the COVID-19 pandemic. In addition, we explored differences in perceived family function between them. Given that depressive symptoms had a negative impact on the family cohesion and adaptability of parents and adolescents, depressive symptoms must be detected as early as possible for the mental health development of adolescents. Family intervention should also be conducted promptly to promote positive attitudes of parents and adolescents in their perception of family cohesion and adaptability.

## Author statement contributors

Feng Wu and Lingtao Kong designed the study. Feng Wu, Yang Cao, Huanrui Zhang, Xin Li, Jie Zou and Zhongwu Guo acquired the data. Mengxue Li and Huanrui Zhang analyzed the data. Mengxue Li, Lili Li and Lingtao Kong wrote the article.

All authors have read the final version of the manuscript and approved the final article were true.

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## Declaration of Competing Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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