Research paper

The role of only-child status in the psychological impact of COVID-19 on mental health of Chinese adolescents

Yujia Cao [a,b,1], Liyuan Huang [a,1], Tong Si [a], Ning Qun Wang [a], Miao Qu [a,*], Xiang Yang Zhang [c,**]

[a] Neurology Department, Xuan Wu Hospital of Capital Medical University, 45 Changchun Street, Xi Cheng, Beijing, 100053, China
[b] Neurology Department, Third Affiliated Hospital, Beijing University of Chinese Medicine, Beijing, China
[c] CAS Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences, 16 Lincui Road, Chaoyang District, Beijing, 100101, China

ABSTRACT

Background: The impact of coronavirus disease (COVID-19) on public mental health in 2019 is verified, but the role of only-child status in the mental health of adolescents confined at home during the COVID-19 epidemic has not been investigated and is not clear.
Objective: Our study aims to assess the impact of only-child status on the mental health of adolescents confined at home during the COVID-19 outbreak. The exposure risk to COVID-19, adverse experience, parent-child relationship, and resilience have also been measured and considered.
Methods: From March 20 to 31, 2020, a cross-sectional survey test was conducted on 11,681 adolescents aged from 12 to 18 years in middle schools (Grade 7 to Grade 9) across five provinces in China. The self-reported online questionnarie was used to collected data of demographic information, the 9-item Patient Health Questionnaire, the 7-item Generalized Anxiety Disorder Scale, the short form of the Childhood Trauma Questionnaire, the Connor-Davidson Resilience Scale and the exposure risk to COVID-19.
Results: A total of 11,180 valid questionnaires were collected, with an effective rate of 95.7%. 35.2% of only children and 38.8% of non-only children reported depression symptoms, while 20.5% of only children and 24.7% of non-only children reported anxiety symptoms. It was significant that non-only children were more likely to have anxiety and depression symptoms than only children (OR = 1.164, 95%CI: 1.064–1.273, $p = 0.001$). The risk of exposure to COVID-19 was a risk factor of depression (OR = 2.284, 95%CI: 1.640–3.180, $p < 0.001$) and anxiety symptoms (OR = 1.959, 95%CI: 1.402–2.737, $p < 0.001$) in non-only children, but not in only children. For both only children and non-only children, the resilience and parent-child relationship were protective factors of depression and anxiety symptoms, while emotional abuse was a risk factor ($p < 0.001$).
Conclusion: The non-only children are more likely to develop the symptoms of anxiety and depression than only children, during the outbreak of COVID-19 in China. The adolescents with siblings are psychiatrically more vulnerable to exposure risk of COVID-19 and need more attention, especially those with poor parent-child relationship, low resilience and experience of emotional abuse.

1. Introduction

Since the end of 2019, COVID-19 has broken out in various parts of China. The Chinese Government and the Ministry of Education issued a policy to close school nationwide (C. Wang et al., 2020). More than 220 million children and adolescents were confined to their homes (G. Wang et al., 2020). The home confinement may develop stress and anxiety (Araújo et al., 2020), however, little has been known due to the lack of investigation in adolescents among home confinement.

Fegert proposed a viewpoint that long-term home confinement may lead to anxiety, especially for adolescents who have no siblings, due to the decreased opportunity to contact with their peers (Fegert et al., 2020). Some studies have investigated the impact of only-child status on mental health (Ngan-Ling Chow and Zhao, 1996), cognition (J. Yang et al., 2017), and personality of children(Mancillas, 2006), whereas the results are inconsistent. Moreover, the role of only-child status in the

mental health of adolescents confined at home during the COVID-19 outbreak has still not been investigated and remains unclear.

When investigating the mental status of adolescents, some important factors that have been proved to be related to depression and anxiety, such as poor parent-child relationship or abuse, should be considered and measured. (Harkness and Monroe, 2002; Stein et al., 1996). While resilience can cope with difficulties and alleviate depression and anxiety caused by adverse experiences (Ding et al., 2017). Therefore, the effects of adverse experience, parent-child relationship, and resilience should be measured in the survey of the mental health status of adolescents.

To the best of our knowledge, there is no empirical study to investigate the effect of only-child status on the mental health of adolescents confined at home during the epidemic of COVID-19. The only-child policy has been implemented in China for 30 years, and 120 million children have been raised as only children (Cai et al., 2018; Guangzhou, 2009). Therefore, it has a demographic advantage to conduct only-child-related surveys in China. Our study aims to assess the impact of only-child status on the mental health of adolescents confined at home during the COVID-19 outbreak. The exposure risk to COVID-19, adverse experience, parent-child relationship, and resilience have also been measured and considered.

2. Method

2.1. Study sample and design

Data were collected from five provinces (Shaanxi, Shandong, Henan, Fujian, Liaoning). Participants included 11,681 adolescents aged from 12 to 18 years old in junior middle school (Grade 7 to Grade 9). This investigation adopted the questionnaire online and collected data through the "Wenjuanxing" platform (www.wjx.cn, Changsha Ranxing Science and Technology, Shanghai, China) from March 20 to 31,2020. We obtained permission from principals and guardians of school before the survey. To ensure the effectiveness of the online survey, we conducted an online training for the head teachers in advance. All the teachers released the link of the questionnaire to students after online school class according to our protocol and supervised the students to complete and submit the questionnaire.

2.2. Ethical approval

Ethics approval of the study was obtained from the Ethics in Human Research Committee of the Third Affiliated Hospital of Beijing University of Chinese Medicine (No.ZYSY-2019KYKTPJ-21), which followed the requirement of the American Association for Public Opinion Research(AAPOR).

2.3. Assessment and measures

The questionnaire consisted of questions that covered: 1) demographic data; 2) parent-child relationship; 3) potential exposure risk of COVID-19; 4) depressive symptoms; 5) anxious symptoms; 6) childhood maltreatment, and 7) resilience.

Demographic data included age, gender, parental marriage status, parental educational level, and only-child status.

The self-evaluation of the parent-child relationship was divided into 3 categories: "poor", "general", and "good".

The questions "Is any relative or friend infected with COVID-19?" and "Whether anyone in the community where you live is infected with COVID-19?" were used to rate their exposure risk. When the answer to any question is "Yes", we considered that the adolescent was in the higher exposure risk of infection than others.

The depressive symptoms were assessed by the Chinese version of the Patient Health Questionnaire for depression (PHQ-9) (W. Wang et al., 2014). A total score ranging from 0 to 27, with a higher score indicating a higher level of depression. The cut-off value of having depression

symptoms was set as 5 (Kroenke et al., 2001). The internal consistency reliability of the PHQ-9 score was acceptable (Cronbach's alpha = 0.86).

The anxious symptoms of adolescents were measured by the Chinese version of the Generalized Anxiety Disorder 7-item (GAD-7) (Qing, 2013). GAD-7 as a measure of anxiety was reliable in the general population (Cronbach's alpha = 0.89) (Löwe et al., 2008). The score range is 0–21, with a higher score indicating a higher level of anxiety symptoms. The cut-off value of having anxiety symptoms was set as 5 (Lai et al., 2020)

The childhood abuse was measured with the Chinese version of the Childhood Trauma Questionnaire (CTQ). CTQ consists of 27 items, divided into 5 subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. The total score of each subscale was 5–25, the whole score ranged from 25 to 125. Previous studies have proved that CTQ was reliable for Chinese adolescents, and Cronbach's alpha was 0.77 (Xingfu et al., 2005).

Resilience was measured using the Chinese version of the Connor-Davidson Resilience Scale (CD-RISC) (X.-n. Yu et al., 2011). CD-RISC consists of 25 items, higher scores mean greater levels of resilience. Internal reliability for CD-RISC was 0.930 (X. Yu and Zhang, 2007).

In addition, we have set standards for judging invalid data. 1)we added two questions to test the validity of the answers, which are "I answered all the questions honestly." "All my answers are based on my real experiences and thoughts." We provided "yes" and "no" options and arrange them in different order in the two questions. If either of these two questions was answered "no", the questionnaire was considered invalid. 2) we checked the IP addresses of the participants, and if the different data was repeatedly submitted from the same IP address, all the data was considered invalid.

2.4. Data analysis

Categorical variables were expressed by number and percentage, and Pearson Chi-square test was used to detect the statistically significant differences between the only children and non-only children.

The normality of continuous variables was confirmed by Shapiro-Wilk test and Q-Q plots, and the equality of variances was determined by Levene test. Continuous variables obeyed the normal distribution were expressed by mean ±standard deviation (SD), and variables with non-normal distribution were expressed as median (quartile).

Multivariate analyses of variance (MANOVA) was used to determine the differences between groups of only children and non-only children in scores of GAD, PHQ-9, resilience, together with 5 sub-scales of CTQ after controlling related covariates.

The binary logistic regression was used to explore the relationship between anxiety or depression with only child status and other related factors. Further, the participants were divided into two groups: adolescents who are only child in family, and adolescents who have siblings; the binary logistic regression was performed separately in two groups, to explore the differences of factors related with anxiety or depression.

All the analyses were based on a 95% confidence interval (CI) to evaluate the non-standardized path coefficient, and the alpha level was 0.05 (Preacher and Hayes, 2004). Statistical analysis was performed using SPSS statistics software (Version 24.0. Armonk, NY: IBM Corp.) statistical software.

3. Result

3.1. Study population and demographics

A total of 11,681 adolescents were included in our study. After excluding invalid questionnaires, 11,180 valid questionnaires were collected, the valid rate of the questionnaire is 95.7%. Of the 11,180 adolescents with an average age of 14.33, there were 5594 boys, 5582 girls, 2744 only children and 8436 non-only children.

Table 1 shows the mean (SD) and frequency (percentage) of only-

Table 1
Summary statistics and comparison of the main variables examined.

Variable	Total (n = 11,180) No. (%)/ M ± SD	Only child (n = 2744) No. (%)/ M ± SD	Non-only child (n = 8436) No. (%)/ M ± SD	χ^2/F	p
Age, years	14.33±1.101	14.37±1.059	14.29±1.108	6.049	0.014
Gender, boys	5598(50.1)	1648(60.1)	3950(46.8)	145.077	<0.001
Father's educational				186.602	<0.001
Elementary school and below	1026(9.2)	180(6.6)	846(10.0)		
Middle school or senior school	7892(70.6)	1777(64.8)	6115(72.5)		
College degree and above	1926(17.2)	697(25.4)	1229(14.6)		
Mother's educational				280.593	<0.001
Elementary school and below	1631(14.6)	206(7.5)	1425(16.9)		
Middle school or senior school	7568(67.7)	1835(66.9)	5733(68.0)		
College degree and above	1654(14.8)	624(22.7)	1030(12.2)		
Parent's marital status				286.255	<0.001
Married	10,194(91.2)	2318(84.5)	7876(93.4)		
Remarried	276(2.5)	64(2.3)	212(2.5)		
Divorced or separated	710(6.4)	362(13.2)	348(4.1)		
Parent-child relationship				15.258	<0.001
Poor	289(2.6)	61(2.2)	228(2.7)		
Normal	2755(24.7)	608(22.2)	2147(25.6)		
Great	8090(72.7)	2066(75.5)	6024(71.7)		
Infection exposure risk, higher	258(2.3)	57(2.1)	201(2.4)	0.857	0.379
Depression symptoms, yes	4240(37.9)	965(35.2)	3273(38.8)	11.131	0.001
Anxiety symptoms, yes	2650(23.7)	563(20.5)	2087(24.7)	20.405	<0.001
PHQ-9	4.53±5.325	4.26±5.256	4.62±5.344	6.959	0.008
GAD-7	2.78±4.198	2.49±3.974	2.87±4.264	15.034	<0.001
Resilience	3.41±0.74	3.49±0.735	3.37±0.742	43.295	<0.001
Childhood maltreatment					
Emotional abuse	7.77±3.153	7.98±3.123	7.70±3.159	11.025	0.001
Physical abuse	5.70±1.792	5.64±1.772	5.72±1.798	9.559	0.002
Sexual abuse	5.16±0.945	5.19±1.124	5.14±0.878	3.890	0.049
Emotional neglect	10.37±4.714	9.99±4.426	10.49±4.799	20.021	<0.001
Physical neglect	7.46±2.735	7.19±2.682	7.54±2.747	32.584	<0.001

child and non-only-child variables, as well as the analysis of the differences between the two groups. In terms of demographic variables, there were significant differences in age, gender, parent's marital status, father's and mother's education ($p < 0.05$), while there were no statistical difference in exposure risk of COVID-19 ($p = 0.379$).

3.2. The psychological outcomes of only children and non-only children

35.2% of only children and 38.8% of non-only children had depression symptoms. 20.5% of only children and 24.7% of non-only children had anxiety symptoms respectively, all P values are less than 0.05.

The MANOVA analysis showed that compared with non-only children, only children scored lower in PHQ-9 ($p = 0.010$), GAD-7 ($p < 0.001$), emotional abuse ($P = 0.001$), physical abuse ($p = 0.002$), emotional neglect ($p < 0.001$) and physical neglect ($p < 0.001$); just scored higher on sexual abuse ($p < 0.05$). Moreover, scored higher on resilience ($p < 0.001$). Chi-square test showed more only children had good parent-child relationships ($p < 0.001$).

3.3. Relationship between related factors with depression and anxiety

3.3.1. Depression symptoms

Binary logistic regression analyses were performed to build regression models and find related factors of depression symptoms (Table 2). In model 1, just only-child status (as the independent variable) and depression symptoms (as the dependent variable) entered. The results showed that non-only children had a higher possibility of depression symptoms (OR = 1.165, 95%CI: 1.065–1.274, $p = 0.001$) than only children. In model 2, only-child status, demographic variables (age, gender, parents' marital status, and parents' education), and exposure risk entered as independent variables. The result showed that non-only children still had a higher possibility of depression symptoms (OR = 1.134, 95%CI: 1.032–1.245, $p = 0.009$). Scores of each scale were

Table 2
Association between only-child status, depression symptoms, and other factors.

Variable	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Only-child status (1 = only children)	1.164* (1.064–1.273)	1.134* (1.032–1.245)	1.113 (0.998–1.241)
Age		1.053* (1.017–1.091)	1.033 (0.992–1.076)
Gender (1 = boy)		1.490* (1.379–1.611)	1.365* (1.245–1.495)
Father's educational (1= Elementary school and below)		0.968 (0.897–1.045)	1.031 (0.943–1.128)
Mother's educational (1= Elementary school and below)		0.931 (0.865–1.003)	0.992 (0.910–1.082)
Parent's marital status (1= married)		1.220* (1.130–1.316)	1.021 (0.932–1.119)
Infection exposure risk (1 = low)		2.278* (1.769–2.932)	2.006* (1.501–2.680)
Parent-child relationship(1 =poor)			0.462* (0.418–0.510)
Resilience			0.441* (0.409–0.474)
Childhood maltreatment			
Emotional abuse			1.307* (1.281–1.333)
Physical abuse			1049* (1.014–1.085)

Note: * $p<0.05$.

included in Model 3, and this model showed that girls, poor parent-child relationships, exposure risk to COVID-19, the scores of resilience, emotional abuse, physical abuse and emotional neglect contributed significantly to depression symptoms (all $p < 0.05$), while the only-child

status was not significant ($p = 0.55$).

3.3.2. Anxiety symptoms

Table 3 presents the results of three regression models of related factors of anxiety symptoms. The variables and enter sequence were identical with models of depression symptoms. In model 1, the results showed that being non-only children was associated with an increased likelihood of anxiety symptoms (OR = 1.273, 95%CI: 1.146–1.414, $p <$ 0.001). In model 2, the result showed that non-only children still had a higher possibility of anxiety symptoms (OR = 1.246, 95%CI: 1.117–1.391, $p < 0.001$). The model 3 showed that being non-only children (OR = 1.239, 95%CI: 1.093–1.406, $p = 0.001$) still contributed significantly to anxiety symptoms, together with girls, poor parent-child relationships, exposure risk to COVID-19, resilience, emotional abuse, emotional neglect and physical neglect.

3.4. The related factors of anxiety and depression in only children and non-only children

The binary logistic regression analyses were performed based on the meaningful variables ($P<0.05$) of model 3 in Table 3 to explore the different related factors with depression (Table 4) and anxiety (Table 5) among only children or non-only children.

3.4.1. Depression symptoms of only children

Among adolescents without sibling, being girl (OR = 1.315, 95%CI: 1.088–1.059, $p = 0.005$) and emotional abuse (OR = 1.277, 95%CI: 1.228–1.329, $p < 0.001$) are risk factors associated with depression symptoms, while good parent-child relationships (OR = 0.483, 95%CI: 0.393–0.594, $p = 0.005$), and resilience (OR = 0.351, 95%CI: 0.417–0.616, $p < 0.001$) are protective factors. Interestingly, exposure risk to CVIOD-19 is not risk factor of depression symptoms in only children (OR = 1.254, 95%CI: 0.680–2.314, $p>0.05$).

3.4.2. Depression symptoms of non-only children

Among adolescents with siblings, being girl (OR = 1.375, 95%CI: 1.239–1.526, $p < 0.001$) and emotional abuse (OR = 1.318, 95%CI: 1.289–1.348, $p < 0.001$) are also risk factors, while good parent-child

Table 3
Association between only-child status, anxiety symptoms, and other factors.

Variable	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Only-child status (1 = only children)	1.273* (1.146–1.414)	1.246* (1.117,1.391)	1.239* (1.093–1.406)
Age		1.045* (1.004,1.087)	1.021 (0.975–1.070)
Gender (1 = boy)		1.561* (1.428–1.707)	1.408* (1.269–1.563)
Father's educational (1= Elementary school and below)		0.987 (0.905–1.075)	1.083 (0.980–1.196)
Mother's educational (1= Elementary school and below)		0.927 (0.853–1.008)	1.002 (0.910–1.104)
Parent's marital status (1= Married)		1.263* (1.163–1.372)	1.044 (0.946–1.153)
Infection exposure risk (1 = low)		2.130* (1.649–2.751)	1.807* (1.341–2.434)
Parent-child relationship(1 =poor)			0.582* (0.525–0.645)
Resilience			0.429* (0.395–0.467)
Childhood maltreatment			
Emotional abuse			1.277* (1.252–1.302)

Note: * $p<0.05$.

Table 4
Binary logistic regression analysis of depression symptoms in only and non-only children.

Variable	Only children OR(95% CI)	Non-only children OR(95% CI)
Gender (1 = boy)	1.315* (1.088–1.590)	1.375* (1.239–1.526)
Infection risk (1 =low)	1.254(0.680–2.314)	2.284* (1.640–3.180)
Parent-child relationship (1 =poor)	0.483* (0.393–0.594)	0.460* (0.411–0.515)
Resilience	0.351* (0.417–0.616)	0.471* (0.433–0.511)
Childhood maltreatment		
Emotional abuse	1.277* (1.228–1.329)	1.318* (1.289–1.348)

Note:* $p<0.05$.

Table 5
Binary logistic regression analysis of anxiety symptoms in only and non-only children.

Variable	Only children OR(95% CI)	Non-only children OR(95% CI)
Gender (1 = boy)	1.712* (1.371–2.139)	1.133* (1.185–1.499)
Infection risk (1 =low)	1.261(0.638–2.490)	1.959* (1.402–2.737)
Parent-child relationship (1 =poor)	0.478* (0.384–0.594)	0.621* (0.553–0.697)
Resilience	0.364* (0.304–0.436)	0.455* (0.415–0.499)
Childhood maltreatment		
Emotional abuse	1.273* (1.221–1.327)	1.281* (1.253–1.310)

Note: * $p<0.05$.

relationships (OR = 0.460, 95%CI: 0.411–0.515, $p < 0.001$), and resilience (OR = 0.471, 95%CI: 0.433–0.511, $p < 0.001$) are protective factors. However, different with only children, exposure risk to CVIOD-19 is a risk factor (OR = 2.284, 95%CI: 1.640–3.180, $p < 0.001$) in non-only children.

3.4.3. Anxiety symptoms of only children

Among adolescents without sibling, being girl (OR = 1.712, 95%CI: 1.371–2.139, $p < 0.001$) and emotional abuse (OR = 1.273, 95%CI: 1.221–1.327, $p < 0.001$) are risk factors of anxiety symptoms, while good parent-child relationships (OR = 0.478, 95%CI: 0.384–0.594, $p < 0.001$) and resilience (OR = 0.364, 95%CI: 0.304–0.436, $p < 0.001$) are protective factors.

3.4.4. Anxiety symptoms of non-only children

Among adolescents with siblings, being girl (OR = 1.333, 95%CI: 1.185–1.499, $p < 0.001$), and emotional abuse (OR = 1.281, 95%CI: 1.253–1.310, $p < 0.001$) are also risk factors of anxiety symptoms, while good parent-child relationships (OR = 0.621, 95%CI: 0.553–0.697, $p < 0.001$) and resilience (OR = 0.455, 95%CI: 0.415–0.499, $p < 0.001$) are still protective factors.

However, different with only children, sex abuse (OR = 1.080, 95% CI: 1.013–1.151, $p = 0.019$), and exposure risk to CVIOD-19 are risk factors (OR = 1.959, 95%CI: 1.402–2.737, $p < 0.001$) among non-only children.

4. Discussion

This study has four major findings. 1) The only children have lower prevalence of both depression and anxiety symptoms than non-only children. 2) The only children are statistically associated with lower risk of anxiety symptoms. 3) When facing the potential exposure risk to

CVIOD-19, non-only children had a higher possibility of having depression and anxiety symptoms. 4) For all adolescents, better parent-child relationships and resilience can protect them from depression and anxiety.

According to our findings, only children show healthier psychological status than non-only children. 35.2% of only children and 38.8% of non-only children reported depression symptoms. While 20.5% of only children and 24.7% of non-only children reported anxiety symptoms respectively(all $P<0.05$). Compared with only children, the non-only children have a higher risk of anxiety symptoms (OR = 1.239, 95%CI: 1.093–1.406). Furthermore, the psychological status of only children seems more stable than non-only children, for the exposure risk to COVID-19 is a risk factor of depression and anxiety symptoms among non-only children, but not in only children.

Though some previous studies indicated that during adulthood, only children were less optimistic, more neurotic (Cameron et al., 2013), and less cooperative (Blake, 1981b) than non-only children, because they had to support their own family and the elderly alone (Fletcher, 2014; Krug, 2013). While during adolescents and childhood, numerous positive results have proved that the status of the only child may be beneficial to mental health. For example, a Chinese study showed that adolescents without sibling reported significantly lower levels of fear, anxiety, and depression than those with siblings (B. Yang et al., 1995). Moreover, a significantly lower level of distress was observed in Chinese adolescents without sibling, than those having siblings (Yao et al., 2015).

These results are consistent with the theory of resource dilution. Resource dilution theory suggests that only children have more family resources, such as parents' attention and encouragement than non-only children, for the addition of each child will dilute the family resources (Blake, 1981a). Since the only child receives more responses (Liu et al., 2010), concerns and interaction (Laosa and Sigel, 1982) from parents, which may produce a greater sense of confidence and security (Blake, 1981a; Bowlby, 1971). Thus, the psychological status of only children is more stable than non-only children, during the outbreak of COVID-19.

In the present study, we found that good parent-child relationship and resilience can protect adolescents from depression and anxiety symptoms, while childhood abuse can exaggerate these symptoms. These results are consistent with previous studies (Liu et al., 2010). As mentioned above, only children have more effective interactions and communication with parents, thus have better parent-child relationship when compared with non-only children. The resilience is an ability to keep mental health and overcome adversity, it plays an important role in moderating depression and anxiety. (Limoncelli, 2012). The only children receive more supports from parents, and this support consequently helps children develop a higher level of resilience (Wright and Masten, 2005). In our study, only children have better resilience and parent-child relationship than the non-only children (all $p < 0.05$). It may explain why only children have better flexibility and less possibility to develop depression and anxiety symptoms when confined at home or facing exposure risk to COVID-19.

On the other hand, we found that emotional abuse is the risk factor of the symptoms of anxiety and depression, both for only an non-only children. It is consistent with a meta-analysis suggesting a causal relationship between abuse and mental illness (Norman et al., 2012).

In summary, according to our findings, only-child adolescents may have advantages on mental health when confined at home or facing the outbreak of COVID-19. The only children are less likely to develop anxiety and depression symptoms than non-only children. It is reasonable that emotional abuse is a risk factor of depression and anxiety symptoms, while resilience and good parent-child relationship are protective factors with moderating effects in adolescents during the outbreak of COIVD-19. Moreover, we appeal to stop emotional abuse as well, for childhood maltreatment can negatively influence mental health of adolescents, it has been proved by previous studies (Geoffroy et al., 2016; ten Have et al., 2019; Zhong et al., 2020).

4.1. Limitations and strengths

There are two limitations of this study. First, all the evaluation are self-reported online survey. The accuracy of data might be disturbed by parental supervision or motivation. Second, other factors such as daily activity and economy status of family were not surveyed in this study.

We also have two strengths. First, this study collected a relatively large sample of over 10,000 Chinese adolescents in different exposure risks during the epidemic. Second, the factors related with depression and anxiety, such as resilience, parent-child relationship, and abuse were also taken into consideration.

5. Conclusion

This study revealed the role of only child status in mental health of adolescents during the outbreak of COVID-19, and provides new evidence for the relationship between Chinese only-child status and adolescents' anxiety and depression symptoms. The non-only children are more likely to develop the symptoms of anxiety and depression than only children, during the outbreak of COVID-19 in China. The adolescents with siblings are psychiatrically more vulnerable to exposure risk of COVID-19 and need more attention, especially those with poor parent-child relationship, low resilience and experience of emotional abuse.

Declaration of Competing Interest

The authors declared that they have no conflicts of interest to this work.

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