


Parenting Stress During COVID-19 Lockdown: Correlates with Family and Child Factors

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Abstract

In response to the COVID-19, a 76-day city-wide strict lockdown was imposed in Wuhan, China. This study aimed to document the family's psychological status during the lockdown and test the role of family functioning, children's mental health, child-parent relationship as well as parenting time during pandemic on parenting stress. The results showed that nearly 18% of the children exhibited clinical-level mental health problems. The children's mental health and child-parent conflict fully mediated general family functioning's impact on parenting stress. The change in childrearing time moderated the effect of the children's mental health problems and child-parent conflict on parenting stress. Findings indicated that, during COVID-19 lockdown, children's mental health and child-parent conflict contributed to parenting stress. More childrearing time would reduce the impact of children's mental health on parenting stress.

Keywords

mental health, parenting stress, family functioning, child-parent relationship, COVID-19 lockdown, moderated mediation model

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As of October 2021, coronavirus disease 2019 (COVID-19) has directly affected more than 240 million people and caused more than 4.9 million deaths globally (World Health Organization, 2021). Soon after the COVID-19 outbreak city- and nation-wide lockdown and stay-at-home orders were imposed in many countries to control the spread of the virus (Brooks et al., 2020). From a research perspective, the sudden, harsh, prolonged, and wide-ranging lockdown policy created a unique situation to understand how people's mental health would be affected by these measures (Singh et al., 2020). It is clear that lockdown prevented the spread of COVID-19 at the cost of freedom; however, the influence of lockdown on mental health is uncertain.

COVID-19 lockdown forced all family members to stay home at all times for an extended period of time. Extended confinement resulting from city-wide lockdown and COVID-19 itself can be seen as a form of collective stress/trauma shared by members within the community. Similar to other types of large-scale and collective traumas, the COVID-19 pandemic can potentially lead to "prolonged, intertwined individual mental health and family relationship problems" (Feinberg et al., 2021, p. 1). As such, there has been an urgent call for more research to better understand the experiences of families, particularly those with young children, so as to identify family support and intervention strategies to prevent potential long-term problems in vulnerable families. Admittedly, differences in the adjustment of individual families in response to the collective trauma may have to do with risk and resources within the family system. According to Prime, Wade, & Browne (2020), this situation may heighten the impact of family environment on each family member's mental status. Therefore, understanding parents' and children's mental health can benefit from attention to the dynamics of the family ecology.

Families in Wuhan were the first to experience COVID-19 first broke out with many unknowns and were the first in the world to experience strict lockdown, they might experience more psychological consequences than the other Chinese population as well as the populations in other countries (Zhou, Nguyen, Zhong, & Liu, 2020). To understand the role of family functioning, children's mental health problems, child-parent relationship quality in parenting stress, this study was aimed to address three questions:

Research question 1: Did general family functioning matter for family wellbeing during the lockdown?

Research question 2: How did children's mental health and child-parent relationship influence parenting stress within the family system?

Research question 3: Did the impact of family and child factors on parenting stress differ depending on the life changes caused by lockdown?

Literature Review

COVID-19 has taken a heavy toll on family mental health. The lockdown policy, Stay-at-Home orders, and other measures used to contain COVID-19 have had a negative impact on the mental health and well-being of populations worldwide (Loades et al., 2020; Patrick et al., 2020; Rajkumar, 2020). According to Fong and Iarocci (2020), the rapid spread of COVID-19 and its policy responses have caused major disruptions to the family routine, as well as mental health challenges to both parents and their children. Research in different countries have yielded similar findings that during the early phase of the COVID-19 pandemic and during the lockdown, parents experienced an increase in depression, and children showed higher levels of mental health issues in comparison to their mental health status before the pandemic (Feinberg et al., 2021; Huebener, Waights, Spiess, Siegel, & Wagner, 2021; Wu et al., 2020). Some studies showed that even when the lockdown had been lifted, many of the symptoms persisted. For instance, González-Sanguino, Ausín, Castellanos, Saiz, & Muñoz (2021) conducted a longitudinal study on mental health at three-time points: early phase of lockdown, 1 month after, and 2 months after the restriction was lifted. They found that depressive symptoms increased over time while anxiety stayed at a high level throughout the three-time points. Furthermore, the psychological status of the parents might be an important indicator of family wellbeing. Spinelli, Lionetti, Pastore, & Fasolo (2020) found that the parent's perceived stress caused by the pandemic and lockdown was the main predictor of family wellbeing. Hence, in this study parenting stress during the pandemic was selected to understand the influence of lockdown on family wellbeing. For urban families with young children, parents and their children had to spend more time with each other during the lockdown than before the outbreak of COVID-19. In general, an increase in the time that parents spent with their children tended to benefit their relationship (Milkie, Nomaguchi, & Denny, 2015). However, in times of heightened stress and anxiety caused by the COVID-19 and the lockdown, the sense of isolation and loneliness experienced by parents and children may complicate such benefit (Xiong et al., 2020).

Since this study was aimed to investigate the well-being of the family, it's necessary to take the family ecology into consideration. According to the Family Adjustment and Adaptation Response Model (Patterson, 2002), both family capacity and family process matter in a family's response to the crisis. Family capacity may encompass the general functioning of the family and resources available to neutralize the threat that has the potential to unbalance the functioning and wellbeing of the family members, while the family process may encompass family relational patterns and interactions between family members to utilize the family resources to create adaptive responses. Likewise, Prime et al. (2020) recently proposed a conceptual model to explain

how the COVID-19 crisis affects the adjustment of family members (e.g., children's adjustment). They explained that COVID-19 mainly affected family members' mental health through its direct and indirect impact on family members, parenting, and family functioning. Their model speculated that social disruptions caused by COVID-19 lockdown likely would take a toll on caregivers' and children's mental health; while the family process could serve as a protective factor in reducing the detrimental effect of the lockdown. For instance, in terms of children's adjustment to COVID-19 lockdown, the model hypothesizes that social disruption caused by COVID-19 (e.g., financial insecurity, social isolation), changes in caregivers' well-being (e.g., distress, mental health symptoms), family process (e.g., family belief, relationship quality, family functioning), and pre-existing family vulnerabilities (e.g., marital conflict, economic hardship) directly and indirectly influence each other and subsequently on their children's adjustment (e.g., emotional symptoms). Thus, within the family system, multiple forces and factors could come into play in response to the disruption and stress from COVID-19 lockdown.

Family functioning involves problem-solving, communication, roles, affective responsiveness, affective involvement, and behavior control between family members (Epstein, Ryan, Bishop, Miller, & Keitner, 2003). It reflects the overall quality of the family environment and predicts family wellbeing. Previous studies have demonstrated that family functioning was a major predictor of parents' mental health (Lewandowski, Palermo, Stinson, Handley, & Chambers, 2010), children's mental health (Kim, Viner-Brown, & Garcia, 2007), and family relationships (Angle, Divney, Magriples, & Kershaw, 2015). Salin, Kaittila, Hakovirta, & Anttila (2020) investigated coping strategies families with children utilized to deal with the challenges during the COVID-19 lockdown. Their study found that factors related to family functioning such as quality family time, supportive family members, and affective communication were the most effective approaches in confronting the challenges. General family functioning was conceptualized to represent the foundation of the family dynamic and family wellbeing.

Children's wellbeing is the core component of family wellbeing (Newland, 2015). Children's mental health and behavior adjustment are the priority of parents' concern. Research on the relationship between children's mental health and parenting stress found that parents would perceive stress, depression, frustration when raising children with psychological or behavioral problems (Herring et al., 2006; McSherry, Fargas Malet, & Weatherall, 2019). During the period of the pandemic, Fitzpatrick, Carson, & Weisz (2020) used a mixed-method study to explore caregivers' and their children's mental states. Their quantitative analysis showed that children's depression and anxiety symptoms were associated with their parents' mental health. The thematic analysis of qualitative data showed that caregivers often mentioned their

feelings of being overextended in parenting and the desire for mental health services. The results confirmed that children's mental health status was related to parenting stress.

Child-parent relationship refers to a unique affiliation between parent and their child. It often encompasses both relational closeness and conflict between parents and their children (Driscoll & Pianta, 2011). On the one hand, the quality of child-parent relationship could affect children's mental health (Sargent & O'Brien, 2004); on the other hand, children's problems could make it difficult for parents to interact with them, which could strain their relationships (Alexandris, Hammond, & McKay, 2013). The parents' evaluation of their relationship with their children would predict their parenting stress. During the COVID-19 pandemic, parenting stress was related to the quality of the child-parent relationship (Russell, Hutchison, Tambling, Tomkunus, & Horton, 2020). Therefore, child-parent relationship might help explain the link between parents' stress and children's mental health in a time of crisis.

Hypothesis

In the current analysis, we adopted and slightly modified the model proposed by Patterson (2002) and Prime et al. (2020) to examine parenting stress during the COVID-19 lockdown. As shown in Figure 1, our model highlighted the mechanisms within the family ecology in response to the crisis by investigating the effects of family's general functioning, children's mental health, and parent-child relationship quality on parenting stress; while at the same time, we explored the moderating effect of change in parenting time during the lockdown on the mediation model. Specifically, we hypothesized that: (1) general family functioning would be the foundation of the family wellbeing. A weaker family functioning would contribute to more children's mental health problems, poorer child-parent relationship, and higher parenting stress; (2)

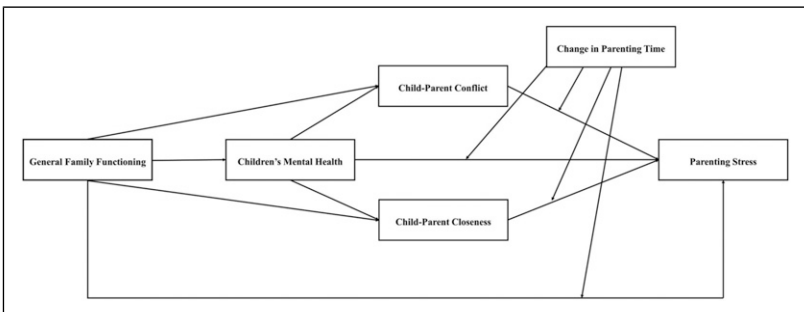


Figure 1. The hypothesized mediation model.

family functioning might influence parenting stress through children's mental health and the child-parent relationship; (3) the extent to which family functioning, children's mental health problems, and child-parent relationship would affect parenting stress might vary by the change in parenting time during the lockdown.

Method

Participants

We recruited families from Wuhan, China soon after the lockdown was lifted. Because parents with young children are less experienced in childrearing, these young families may be more vulnerable to unexpected changes during the pandemic (Patrick et al., 2020). Therefore, we chose young families as our target participants. To be eligible for the study, the families must be living in the districts that had undergone strict lockdown and the children must be in preschool-kindergarten ages (i.e., 2–6 years). Additionally, the participating families must have had experienced lockdown together but had not contracted the COVID-19.

To determine the sample size for our study, we used G*Power version 3.1.9.7 (a power and sample size data analysis tool, Faul, Erdfelder, Buchner, & Lang, 2009) to calculate the necessary size of the sample to achieve an 80% power and a medium effect size (Cohen $f^2 = 0.15$) for multiple regression with nine predictors. The suggested minimal sample size was 114.

Two steps were taken to recruit participants: First the directors of seven randomly selected preschools were contacted, one from each of the seven districts. Four directors agreed to distribute our study information to parents in their respective schools. Parents who were interested in participating in the study were instructed to access a survey link via computer or cellphone. It took approximately 30 minutes to complete the survey. This step led to valid data on 59 children. To recruit participants from the other three districts and from parents whose children had not entered preschool, the most popular social media platform Wechat parent groups were used to post the study information. This step led to valid data on 50 children who were attending other preschools and 21 children who were not attending preschool. Overall, the 130 children were attending 45 different preschools in Wuhan's seven districts. These preschools included those that were affiliated with a university, private preschools and international preschools for children from high-income families (e.g., Montessori schools), government-subsidized preschools for children from low-income families, and subsidized preschools for children of the government employees. The types of preschools were consistent with learning centers where the vast majority of urban children attend in the city of Wuhan. The 130 valid responses were from 156 responses (valid response rate: 83%). The invalid

responses included surveys that were accessed but no attempt was made to complete any part of the survey, surveys with less than 85% completed, and surveys with key information missing.

Measures

Demographic Characteristics and Parenting During Lockdown. We obtained demographic information from the participating parents on their children's age, gender, their marital status, gender, age, education level, and occupation. Finally, the participating parent reported who were the main caregivers for the child in the household and the number of caregivers in the household during the lockdown.

Change in Parenting Time. Because of the lockdown, adults in the family were entirely responsible for meeting the children's physical, emotional, and learning needs day in and day out. As some families divided the responsibilities among the mother, father, and grandparents, the amount of time that the participating parent spent in caring for the child could vary considerably. In our study, the participating parents reported on the amount of time (in hours) that they spent daily in childrearing before and during the lockdown. Depending on the age of the child, parenting responsibilities might include cooking and feeding the child, playing with the child, reading books to/with the child, managing behavior problems, and monitoring schoolwork. In the current analysis, we used the difference (in hours) between before and during the lockdown to reflect the change in the amount of time that the participating parents spent daily caring for the children. A score larger than 0 means that the participating parents spent more time caring for their children during the lockdown than before the lockdown; a score of 0 means no change in the amount of time spent in caring for the children; a score less than 0 (i.e., a negative value) means the parents spent less time caring for their child during the lockdown.

General Family Functioning. We used the Chinese version of the General Functioning Index (GFI) from the McMaster Family Assessment Device (MFAD; Epstein, Baldwin, & Bishop, 1983) to measure the general functioning of the family. MFAD is a self-report scale designed to assess family environment, which has been demonstrated as a useful tool to identify healthy and unhealthy functioning within a family (Hamilton & Carr, 2016). The Chinese version of the measure has demonstrated excellent reliability and construct validity (Shek, 2001). In the current study, it was operationalized to reflect the vulnerability level of the family ecology in response to COVID-19 and the lockdown. The GFI uses six positively worded statements to measure the general strength of the family ecology and six negatively worded

statements to measure the vulnerability of the family ecology. The participant responded to the item on a 4-point scale (1 = *strongly disagree*, 4 = *strongly agree*). One example of the negatively worded statements is “We cannot talk to each other about the sadness we feel” and one example of the positively worded statements is “In time of crisis we can turn to each other for support.” In the current analysis, the six positive statements were reversely scored so that a higher sum score indicates poorer general family functioning. For the current sample, the GFI scale had high internal consistency ($\alpha = .84$). Higher scores indicate that the family environment carried a higher level of vulnerability for family members to develop maladjustment.

Children’s Mental Health. The Chinese version of the Strengths and Difficulties Questionnaire (SDQ parent-reported; Goodman, 1997) was employed to measure children’s mental health problems. The SDQ is considered as one of the most employed instruments in screening mental health issues among children aged 3 to 16 (Deighton et al., 2014; Stone, Otten, Engels, Vermulst, & Janssens, 2010). The Chinese version of the SDQ has well-documented reliability and validity (Du, Kou, & Coghill, 2008). Parents reported their children’s behavior and psychological status on a 3-point scale (0 = *does not apply*, 2 = *certainly applies*). The 25-item SDQ has five subscales (each subscale has five items): emotional symptoms (e.g., “Many worries or often seems worried.”), conduct problems (e.g., “Often lies or cheats.”), hyperactivity (e.g., “Constantly fidgeting or squirming.”), peer problems (e.g., “Rather solitary prefers to play alone.”), and prosocial behavior (e.g., “Considerate of other people’s feelings.”). The first four subscales form the total difficulties score. The Cronbach’s α for total difficulties was .74. For the parent-reported SDQ, Du et al. (2008) suggested that a child who scored higher than 16 in total difficulties would be considered at high risk for mental health problems. In the current analysis, we used the total difficulty score to reflect the children’s mental health problems that could result from poor family functioning and contribute to parenting stress.

Child-Parent Relationship Quality. The Chinese version of the Child-Parent Relationship Scale Short-Form (CPRS-Short Form; Driscoll & Pianta, 2011) was used to measure child-parent relationship quality. The CPRS is a self-reported instrument to evaluate parents’ perception of their relationship with their children. Previous studies revealed an excellent psychometric propensity of this scale (Dyer, Kaufman, & Fagan, 2017; Simkiss et al., 2013). Also, the Chinese version of the CPRS had good reliability and validity among Chinese participants (Zhang, 2011). The CPRS includes 8 items on the extent of Conflict (e.g., “My child and I always seem to be struggling with each other.”) and 7 items on Closeness (e.g., “My child values his/her relationship with me.”). Parents reported their perception of their relationship with their

children on a 5-point Likert scale (1 = *definitely does not apply*, 5 = *definitely applies*). For the current sample, the Cronbach's α was .81 for the conflict subscale and .78 for the closeness subscale. A higher score on the conflict subscale implied that the relationship was more conflictual; whereas a higher score on the closeness subscale indicated that the relationship was more affectionate.

Parenting Stress. The lockdown forced parents to stay at home all day. For children who were typically cared for by grandparents, the lockdown increased the number of caregivers at home; for children who did not have grandparents caring for them and were cared for by a stay-at-home parent, the lockdown typically led to the other parent (usually the father) staying at home as an additional caregiver. In both cases, the lockdown led to changes in the children's caregiving arrangement. In the current study, the Chinese version of the Parenting Stress Index Short Form (PSI-SF; [Abidin, 1995](#)) was used to measure the participating parents' parenting stress during the lockdown. PSI-SF is an ideal screening tool to identify parenting system issues and evaluate the experienced distress as a responsible parent ([Haskett, Ahern, Ward, & Allaire, 2006](#)). The Chinese version of the PSI-SF has well-documented reliability and validity ([Yeh et al., 2001](#)). The PSI-SF includes 36-items on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). These items measure negative feelings associated with parenting (e.g., "I feel trapped by parenting responsibilities."), difficulties from caring for the child or interacting with the child (e.g., "my efforts for my child aren't appreciated.") and challenges in the children's temperamental characteristics (e.g., "my child gets upset easily."). In the current study, the sum of the 36 items was used to reflect parenting stress during the lockdown ($\alpha = .94$). A higher score indicates more parenting stress.

Results

Descriptive Statistics

Among the participating families, the children were aged 2.0–6.4 years (mean = 4.26 ± 1.12 years). The fathers were aged 24–57 years (mean = 32.55 ± 4.31 years), and the mothers were aged 23–43 years (mean = 31.41 ± 3.50 years). [Table 1](#) showed the detailed demographic information. The majority of respondents were mothers (73.8%). 83.1% of families were one-child families and 70.8% of children were taken care of by both parents and grandparents. The response showed that 80.8% of families were in the situation where parents and grandparents lived together during the lockdown.

The average mental health problem was 11.73 ± 4.43 . According to the diagnostic criteria for Chinese children suggested by [Du et al. \(2008\)](#), 17.7% of children showed a higher total-difficulties score than the cutoff for clinical

Table 1. Participating Family Demographic Characteristics ($N = 130$).

Characteristics	<i>n</i> (%)
Child Gender	
Boy	70 (53.8)
Girl	60 (46.2)
Respondent	
Father	34 (26.2)
Mother	96 (73.8)
Number of Children	
One	108 (83.1)
Two	22 (16.9)
Marital Status	
Married	125 (96.1)
Divorced	4 (3.1)
Blended	1 (0.8)
Father's Education Level	
High school	20 (15.4)
Undergraduate	92 (70.8)
Graduate	12 (9.2)
Missing	6(4.6)
Mother's Education Level	
High school	18 (13.8)
Undergraduate	104 (80.0)
Graduate	8 (6.2)
Grandparents in Household During the Lockdown	
Yes	105 (80.8)
No	25 (19.2)
Main Caregiver	
Parents only	19 (14.6)
Grandparents only	19 (14.6)
Parents and grandparents	92 (70.8)

adjustment (i.e., >16), which implied they might have mental health issues during the lockdown. The paired t-test showed that parents spent more time (6.32 ± 4.68) caring for their children during the lockdown than pre-lockdown (3.51 ± 2.97), $t = 8.337$, $df = 129$, $p < .001$, $d = 0.72$. This result indicated that the participating parents' childcaring time increased by about 3 hours per day during the lockdown. The mean score and correlations among the main variables were displayed in [Table 2](#). Parenting stress was positively correlated with general family functioning, children's mental health problems, and child-parent conflict, respectively ($r = .476$, $p < .001$; $r = .667$, $p < .001$; $r = .707$, $p < .001$);

Table 2. Correlation Coefficients of Family Functioning, Children's Mental Health Problems, Child-Parent Relationship Quality, Change in Parenting Time, and Parenting Stress (N = 130).

	1	2	3	4	5	6
<i>M (SD)</i>	21.90 (5.31)	11.73 (4.43)	18.01 (5.24)	29.02 (3.60)	2.81 (3.84)	83.20 (22.29)
1. General Family Functioning	–					
2. Children's Mental Health Problems	.489**	–				
3. Child-Parent Conflict	.447**	.595***	–			
4. Child-Parent Closeness	–.381**	–.466**	–.582***	–		
5. Change in Parenting Time	–.057	–.069	–.178*	.274**	–	
6. Parenting Stress	.476**	.667***	.707***	–.494**	–.112	–

Note. Change in parenting time indicated the difference between the amount of time parents spent caring for the children during the lockdown (6.32 ± 4.68) and the time before the lockdown (3.51 ± 2.97).

* $p < .05$, ** $p < .01$, *** $p < .001$.

parenting stress was negatively associated with closeness of child-parent relationship ($r = -.494, p < .001$).

Moderated Mediation Analysis

We examined the moderated mediation model among general family functioning, children's mental health problems, child-parent relationship quality (i.e., child-parent closeness and child-parent conflict), change in parenting time from pre-lockdown, and parenting stress. In order to reduce multicollinearity among multiple variables and to simplify the interpretation of the results, the scores for general family functioning, children's mental health problems, and child-parent relationship quality were transformed into standardized scores to analyze the interaction effect. We analyzed the mediation effects of children's mental health and child-parent relationship quality on the relationship between general family functioning and parenting stress, as well as the moderating role of parenting time change in parenting stress. Note that because the demographic variables were not correlated with the main variables, they were not taken into consideration in the moderating mediation modeling.

As shown in [Table 3](#), general family functioning significantly predicted the children's mental health problems (Model 1: $\beta = .489, p < .001$). General family functioning and children's mental health problems significantly predicted child-parent conflict (Model 2: $\beta = .206, p = .012$; $\beta = .495, p < .001$), while general family functioning and children's mental health problems significantly predicted child-parent closeness (Model 3: $\beta = -.198, p = .025$; $\beta = -.374, p < .001$). In model 4, children's mental health problems and child-parent conflict significantly predicted parenting stress ($\beta = .471, p < .001$; $\beta = .296, p = .006$). These results indicated that children's mental health problems and child-parent conflict fully mediated the link between family functioning and parenting stress. Moreover, the interaction between children's mental health problems and the change in parenting time from pre-lockdown, as well as the interaction between child-parent conflict and change in parenting time significantly predicted parenting stress ($\beta = -.276, p = .030$; $\beta = .283, p = .023$).

Overall, the results showed that general family functioning, children's mental health problems, child-parent relationship, and the change in parenting time explained 62.4% of the variance in parenting stress. The children's mental health problems and child-parent conflict fully mediated the effect of general family functioning on parenting stress. A poorer family functioning predicted more mental health problems in children, which predicted more conflict between parents and children, eventually increasing parenting stress. The change of child-parent time moderated the effect of children's mental health problems and child-parent conflict on parenting stress. More increased

Table 3. Summary of Results from Moderated Mediation Model Analysis (N = 130).

Variable	Model 1 (Children's Mental Health Problems)		Model 2 (Child-Parent Conflict)		Model 3 (Child-Parent Closeness)		Model 4 (Parenting Stress)	
	β	t	β	t	β	t	β	t
1. General Family Functioning	.489	6.286***	.206	2.564*	-.198	-2.230*	.100	1.052
2. Children's Mental Health Problems			.495	6.159***	-.374	-4.217***	.471	4.774***
3. Child-Parent Conflict							.296	2.827**
4. Child-Parent Closeness							-.056	-0.592
5. Change in Parenting Time							.023	0.315
Interaction								
6. 1×5							.026	0.224
7. 2×5							-.276	-2.190*
8. 3×5							.283	2.305*
9. 4×5							.039	0.365
R ²	.239		.386		.251		.624	
F	39.511***		39.365***		20.977***		21.796***	

* p < .05.
 ** p < .01.
 *** p < .001.

in parenting time during the lockdown and more child-parent conflict together exacerbated parenting stress; while more parenting time reduced parenting stress for children with more mental health problems.

Discussion

The COVID-19 pandemic poses a threat to the well-being of members within the family ecology. Our main goal in this study was to investigate the role of child-parent relationship quality and children's mental health problems in the link between family functioning and parenting stress. Our hope was to gain insights into the potential impact of lockdown on family mental health with attention on identifying possible risk and protective factors in coping with the mental health challenges from crises like COVID-19. Based on data from a sample of Wuhan families, our study yielded several informative findings.

First, compared with Chinese preschoolers' normative scores for strengths and difficulties questionnaire (SDQ), almost one-fifth of children had mental health difficulties. Typically, the prevalence of young children's mental health problems predicted by the SDQ was about 9%–15% of the population (Du et al., 2008; Goodman & Goodman, 2011; Lai et al., 2010). Our study found that the proportion of children at high risk of adjustment problems during COVID-19 lockdown was higher than usual. A growing body of research demonstrated that children exhibited more emotional symptoms and behavioral problems since the outbreak of COVID-19 (Feinberg et al., 2021; Liu et al., 2020; Xie et al., 2020). The rapid increase in new cases along with overly reported information provided by media during the lockdown created ongoing fear, tension, and uncertainty (Garfin, Silver, & Holman, 2020). Both parents and children would be easily affected and become more anxious, depressed, or fearful.

Second, we found that children's mental health problems and child-parent conflict fully mediated the effect of general family functioning on parenting stress. Poor family functioning predicted more mental problems in children, which in turn added more stress to parenting. The psychological benefit of a favorable family environment is well-documented (Cobham, McDermott, Haslam, & Sanders, 2016; Pan, Yang, Han, & Qi, 2021). Because the lockdown might heighten children's sense of uncertainty and unpredictability, the need for a strong family foundation (i.e., favorable general functioning) would become more apparent. However, for families that already had a compromised general functioning, the lockdown likely further undermines the general family functioning possibly because these families are characterized by more conflict, less affection, excessive control, and disorganization. Exposing to those types of family environments, children would easily imitate other family members' poor interaction patterns, which resulted in more adjustment problems (Oltean, Perlman, Meyer, & Ferro, 2020). Children

might choose some passive ways such as crying, startling, and hyperactivity to get parents' attention or express their needs, while their parents misinterpreted those as problem behaviors (Snyder, Cramer, Afrank, & Patterson, 2005). Consequently, children's undesired behavior would affect parents' feelings about their parenting. The previous studies demonstrated that parents felt more stressed if their children were diagnosed with psychological problems, behavioral problems, or other mental disorders (Lecavalier et al., 2006; McSherry et al., 2019; Plant & Sanders, 2007). Those studies acknowledged that raising a difficult child would require significant time and energy, parents easily got frustrated and exhausted, especially when they attempted to deal with their children's problems but failed.

Family environment could also predict the closeness and conflict between children and parents in expected directions. Because family environment reflects how well family members communicate and interact with each other, it is a stable indicator of the quality of family members' interactions. A poorly functioning family indicated a high level of conflict among family members (Hayden et al., 1998). As shown from our study, poor general family functioning contributed to more child-parent conflict and less closeness. The research verified the strong connection between family environment and child-parent relationship (Anglely et al., 2015). Hence, the parent's perceived conflict with children could be associated with their unpleasant family environment. Parenting stress was related to more parent-child conflict and less closeness. This was in line with previous studies that the increased parenting stress was due to poor interaction or continuous conflict between parents and children (Dennis, Neece, & Fenning, 2018; Russell et al., 2020). When parents did not positively react to their children's demands or they misinterpret their children's behavior they might use some ineffective parenting skills to deal with children, which in turn made the situation worse and discouraged the parents (Chung, Lanier, & Wong, 2020). Overall, there was a chain effect that a well-functioning family reduced the possibility of the occurrence of children's mental problems and strengthened the parent-child closeness which in turn reduced parenting stress.

Third, change in parenting time due to lockdown moderated the effect of children's mental health problems and child-parent conflict on parenting stress. Compared with a low conflict child-parent relationship, greater child-parent time change would exacerbate the parenting stress of a high conflict family. As discussed above, the conflict between parents and children would cause more parenting stress. Our study showed that the average parenting time during the lockdown was longer than usual. Chung et al. (2020) found that the time change due to COVID-19 lockdown placed new demands on parenting, which meant that parents had more to be concerned about. For a conflicted relationship, the prolonged time with children could amplify the conflict. Given that children were around parents all the time, parents would have more chances to observe their children and they might notice more misbehaviors.

Parents might become more irritable, critical, and harsh in parenting, which created a vicious circle. Thus, the increased parenting time with children who had more conflict with parents would intensify parenting stress.

Fourth, our findings supported the idea that more mental health problems in the children would be related to more parenting stress. However, when everything else was equal, increasing parenting time during the lockdown would reduce parenting stress, particularly for children with high mental health problems. One possible explanation is that the risk for mental health problems was elevated for children who experience deprivation of parental involvement. Prior to the lockdown, the children's parents had to work away from home and were less likely to offer their children abundant attention and care. Parent's stress might increase when they had to balance work and parenting. Parents could feel guilty about their limited time at home to meet the needs of their children (Sidebotham and ALSPAC Study Team, 2001). Lockdown provided a chance for parents to focus more on their children. Parents became more responsible as they were getting more involved in their children's lives, which further eliminated their self-doubt about raising difficult children.

Limitation and Future Study

While our study has the strength of addressing a timely topic with a hypothesized model that highlights the complex relationship among variables within the family ecology, the limitations of our study should be kept in mind when interpreting the findings. First, we relied on retrospective data to address our research questions. Having data from before the outbreak of COVID-19 would have greatly strengthened the design of the current study. Because the children's mental health status and parenting stress before the pandemic were unknown, we were less confident to demonstrate to what extent the mental health was influenced by COVID-19. Second, most of the participants were first-time parents with young children. Their experiences might not represent the experiences of families with more than one child and families with older children. Therefore, future studies could examine the influence of lockdown on family mental health with diverse age groups of children and their parents. Third, as a cross-sectional study that relied on volunteering participants, our study has the typical limitations of this type of design. More research with a more sophisticated design would be useful. Additionally, a follow-up or longitudinal study is needed to explore the long-term influence of COVID-19 on parenting experiences. Fourth, the specific role of grandparents was not tested in the model. The data in the current study showed that whether grandparents lived in the household during the lockdown did not affect parenting stress. The previous study found that parenting stress was associated with the relationship quality between parents and grandparents (Kim, 2016). A cooperating

relationship could relieve parenting stress. This might imply that whether grandparents affect parenting largely depends on co-parenting relationships rather than the fact of co-residence. Therefore, future studies could examine the effects of co-parenting-related variables (e.g., co-parenting relationship or parenting belief between two generations) on family well-being.

Conclusion

Our study demonstrated that in the time of social and economic crisis caused by COVID-19, families with lower general functioning appeared to be more vulnerable in responding to the crisis. As general family functioning served as the foundation of the family wellbeing, a weaker foundation likely was less resilient in coping with the stress. As a result, a lower family functioning contributed to more mental health problems in children, more child-parent conflict, and less child-parent closeness, which would become sources of parenting stress. Nonetheless, parents who spent more time caring for their children during the lockdown tended to experience less parenting stress which revealed that the increased parenting time caused by COVID-19 lockdown could have positive implications for family well-being to some extent.

Declaration of Conflicting Interests

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Ethics Approval

All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Participate

Informed consents were obtained from all respondents included in the study.

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