



A Preliminary Study of COVID-19-related Stressors, Parenting Stress, and Parental Psychological Well-being Among Parents of School-age Children

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Abstract

The COVID-19 pandemic has had substantial health, social, and economic effects on families. Consequent lockdowns and school closures heightened the burden on parents of school-age children. Many parents, while working from home, had to care for their children with restricted access to caregiver resources and to support their children's education through homeschooling or remote learning provided by their schools. These duties created challenges and pressures on parents. Using online survey data collected from 197 parents of school-age (Prek-12) children during the first three months of the COVID-19 pandemic in the U.S., this preliminary study examined the relations among COVID-19-related stressors, including fear of COVID-19 and problems associated with school closures, parenting stress, and parental psychological well-being. Fear of COVID-19 and various issues associated with school closures were related to parenting stress and parental well-being. Parents with less instrumental and emotional support reported higher levels of parenting stress and lower levels of psychological well-being. The results of hierarchical multiple regressions revealed that parenting stress was the strongest predictor of parental psychological distress. Social support was associated with parental well-being but did not mediate the relation between parenting stress and parental well-being. The findings suggest that parenting stress during the COVID-19 lockdowns might take a toll on the mental health of parents of school-age children. Parents of school-age children need multiple layers of support, including targeted support addressing stressors related to school closures and parenting under quarantine.

Keywords COVID-19 · Pandemic · Parenting stress · Parental well-being · School-age children

Highlights

- Taking care of children and supporting their education through home schooling or remote learning during lockdowns created unique parenting challenges for parents of school-age children.
- Parenting stress was a strong predictor of parental well-being during the COVID-19 pandemic.
- Social support was related to parental well-being but did not mediate the relation between parenting stress and parental well-being.

The highly contagious COVID-19 virus prompted a number of dramatic lifestyle changes to reduce the spread of the disease. By the end of March 2020, governmental

shelter-in-place mandates confined more than half of the U.S. population to their homes (Moreland et al., 2020). Consequently, more than 124,000 schools in the U.S. closed immediately, affecting at least 55 million students (Education Week, 2020). The majority remained closed for the rest of 2019–2020 school year, and many schools were still closed or functioned on reduced schedules during the 2020–2021 school year (UNESCO, 2021). Even schools that reopened fully sometimes had to alter their schedules to respond to staff or student COVID-19 outbreaks.

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The resultant changes to the daily lives of families were often dramatic. Many parents were left to manage their child's education and care at home on their own (Spinelli et al., 2020a). Stay at-home orders and school closures limited children's physical activities, social interactions with other children, and access to services they typically received at school (e.g., meals, counseling, speech, and occupational therapies). Various studies have described negative effects on children associated with life during the COVID-19 pandemic such as anxiety, sleep, and health-related problems (López-Bueno et al., 2021; Ravens-Sieberer et al., 2021). Lawson et al. (2020) reported child maltreatment and abuse as a consequence of pandemic-related parental job and income loss. Particularly, low-income families and families of color are disproportionately affected by these social and economic shifts due to the pandemic (Chen et al., 2021; Cluver et al., 2020; Mitchell, 2020; Ravens-Sieberer et al., 2021).

A study by Broadway et al. (2020) suggested that parents of school-age children were particularly vulnerable to mental distress during the COVID-19 pandemic. Similar to other adults, many parents experienced high rates of unemployment and other financial hardships following the COVID-19 outbreak (Congressional Research Service, 2020; Kochhar, 2020). In addition, fear of COVID-19 infection, social isolation, and stress led to a surge in the percentage of adults experiencing symptoms of depression and anxiety (Abbot, 2021; Huang & Zhao, 2020). Unlike other adults, however, parents of school-aged children had the additional stressors of managing their children's education and care with no or little assistance during school closures and reduced academic schedules due to COVID-19 outbreaks.

According to the family stress model (Conger & Conger, 2002; Conger et al., 2012), economic hardships and environmental stressors can undermine parental mental health and parenting efficacy (Gard et al., 2020; Scaramella et al., 2008). In addition, Wu and Xu's (2020) family stress theory-informed perspective on COVID-19 suggested that COVID-19 induced stressors, such as marital conflicts or domestic violence, intensified parent-child relationship, and challenges in homeschooling, may contribute to a sense of inadequacy in parenting and ineffective parenting practices.

Due to school closures, children had to transition into remote learning using various learning platform (United Nations Children's Fund, 2020). This transition placed a significant amount of stress on families because parents were expected to provide daily, structured routines at home to ensure their children's participation and completion of assignments online. Some parents lost their jobs and had to deal with the additional stress of income loss (Chen et al., 2021). Others struggled to balance working full time while managing their children's care and education due to school

closures (Chen et al., 2021). Many parents who continued to work outside of the home worked in high-risk environments that contributed to worry that they might become ill and unable to work or care for their children (Griffith, 2020).

Parents play a major role in children's emotional regulation by reading and responding to their children's distress that can lead to lower distress levels (Kopp, 1982). Due to pervasive COVID-19-related stressors, some parents may have had difficulty regulating their emotions to meet children's emotional needs. Children who did not receive parental emotional support during lockdowns and school closures may experience long-lasting effects, such as emotional or behavioral problems (Spinelli et al., 2020b). Therefore, it is important to address parenting stress and parental psychological well-being during pandemics such as COVID-19.

Extensive research has identified social support as a vital protective factor for mental health and well-being across demographics (e.g., Khoury et al., 2021, Mushonga & Henneberger, 2020; Schiller et al., 2021). However, ongoing lockdowns and strict social distancing measures used to slow the spread of COVID-19 substantially disrupted the means of obtaining social support for individuals and families (e.g., Giebel et al., 2021; McKinley, 2020). Although families may have been able to stay in contact via virtual methods, such as texting, phone calls, and video conferencing; in-person family supports decreased significantly. Parents of school-age children may have been particularly affected by the fading of external resources and traditional social support systems (e.g., babysitters, friends, extended family members) in the midst of the pandemic. Due to decreased social support and help with childcare and schooling, parents may have had less opportunity for leisure activities (Griffith, 2020). Thus, parents of school-age children may have been at a greater risk for burnout because they were unable to make time for themselves (Parkes et al., 2015). Social support during a crisis is particularly vital to the control of parenting stress (Brown et al., 2020) and psychological distress (Liu et al., 2020).

The Present Study

Community-wide disasters often lead to extensive and pervasive social, economic, and mental health consequences and complications. Although COVID-19-related stressors, such as fear of infection, disruptions to work and learning, social isolation, and lack of access to resources, have created unprecedented challenges for the majority of the population globally, these stressors are particularly intensified for those who care for children (Russell et al., 2020). As a part of a larger research project that investigated the impact of the COVID-19 pandemic on families and children, the present study focused on the factors contributing

to parenting stress and parental psychological well-being among parents of school-age children in the U.S. Specifically, we examined the roles of COVID-19-related stressors, including fear of COVID-19 and consequences of school closures, in predicting parenting stress and parental mental health. In addition, we examined the role of social support in mediating the relation between stressors and parents' psychological well-being.

Some studies have included parent/caregiver stress as a component of well-being, conflating the two constructs (e.g., Gerard et al., 2006). However, some researchers (e.g., Driscoll et al., 2018; Estes et al., 2013; Singer et al., 1999) have suggested that parenting stress and psychological distress represent two distinct constructs. Estes et al. (2013) argued that the distinction between parenting-related stress and psychological distress is important because parenting-related stress is directly related to the role of parenting, whereas psychological distress reflects a more general state or trait. Similarly, Driscoll et al. (2018) defined parenting stress as “mental or emotional strain an individual experiences as a result of being a parent (e.g., stress from enforcing bedtime, preparing meals, arranging after-school activities)” (p. 746), and parental psychological distress as “personal distress experienced by an individual person who is also a parent (e.g., anxiety, depression, somatic symptoms)” (p. 746). In this study, parenting stress is viewed as a distinct variable with a potential relation to well-being.

We hypothesized that fear of COVID-19, issues resulting from school closures, and parenting stress would be associated with parents' psychological distress. We also hypothesized that social support would mediate the relation between COVID-19-related stressors and parental psychological well-being.

Method

Participants

The sample included 197 US parents (179 mothers and 18 fathers) of school-age children, with a mean age of 41.08 years ($SD = 8.35$). Fifty-seven percent of the participants resided in New York State, and 25 other states representing the rest of the sample ($ns = 1-14$). The vast majority ($n = 179, 90.9%$) of the participants were female, and two-thirds were White/Caucasian ($n = 131, 66.5%$). About half of the participants had two or more school-age children across PreK-12 grade levels; 18% had at least one child in preschool, 8% had at least one child in kindergarten, 43% had at least one child in elementary school, 26% had at least one child in middle school, and 29% had at least one child in high school. Table 1 presents the participants' demographic information.

Table 1 Demographic data of sample

	<i>n</i> (%)
Gender	
Female	179 (90.9)
Male	18 (9.1)
Race/Ethnicity	
Asian and Pacific Islander	14 (7.1)
American Indian and Alaska Native	3 (1.5)
Black/African American	15 (7.6)
Latin/Hispanic	27 (13.7)
White/Caucasian	131 (66.5)
Mixed/Biracial/Multicultural	5 (2.5)
Other	2 (1.0)
Family structure	
Single-father household	3 (1.5)
Single-mother household	31 (15.7)
Two-parent home	159 (80.7)
Other	4 (2.0)
Household income	
\$25,000 or under	13 (6.6)
\$25,001–\$50,000	22 (11.2)
\$50,001–\$75,000	19 (9.6)
\$75,001–\$100,000	26 (13.2)
\$100,001–\$200,000	67 (34.0)
More than \$200,000	40 (20.3)
Other	3 (1.5)
No response	7 (3.6)
Employment status	
Full-time employed	119 (60.4)
Part-time employed	20 (10.2)
Self-employed	17 (8.6)
Homemaker	17 (8.6)
Unable to work	2 (1.0)
Out of work at the moment	16 (8.1)
Other	5 (2.5)
No response	1 (0.5)

Measures

Fear of COVID-19 scale

We developed the Fear of COVID-19 Scale to measure individuals' fears in relation to COVID-19 based on the Fear of Swine Flu Questionnaire (FSFQ; Remmerswaal and Muris (2011)). We modified each FSFQ item by substituting the term “COVID-19” for the term “swine flu”. The Fear of COVID-19 scale consists of 15 items (e.g., “Are you more afraid to become ill since the outbreak of COVID-19?”, “Would you be scared if your neighbors had COVID-19?”). Participants rate each item on a 5-point scale, ranging from

1 (*not at all*) to 5 (*extremely*). A mean scale score was calculated, with higher scores indicating greater fear of COVID-19. The scale demonstrated good internal consistency (Cronbach's $\alpha = 0.95$) in our sample.

Consequences of school closure associated with COVID-19 outbreak

We adopted nine items from a 2009 influenza A (H1N1) study conducted by Centers for Disease Control and Prevention (CDC, 2010) to measure the consequences of school closure associated with the outbreak of COVID-19 (e.g., “*missed work*,” “*child missed free or reduced-cost school meals*,” “*lost pay or income*”). The items were used verbatim except for substituting “COVID-19” for “Swine Flu.” We added four new items (e.g., “*arranged childcare*,” “*felt stress over planning educational activities at home*”) to address difficulties associated with childcare and home learning environments in this study. Participants checked off all items that applied to them. Each item was used as an independent predictor in the study. See Table 2 for the 13 items in this measure.

Parenting stress

We used the 7-item scale developed by Greenberg (2017) to assess the level of parenting stress. Participants rated how often they had been upset due to an unexpected event or frustration related to their children on a 5-point scale, ranging from 0 (*never*) to 4 (*very often*). Sample items include “*felt irritable and impatient with your kids about small things*” and “*had difficulty concentrating because of a child's problem*.” A mean score was obtained, with higher scores representing higher levels of parental stress. This measure showed good internal consistency reliability in this study (Cronbach's $\alpha = 0.88$).

Psychological well-being

The 14-item Stress subscale of the Depression, Anxiety, and Stress Scale (DASS; Lovibond & Lovibond, 1995) was used to measure psychological distress. Participants rated on a 4-point severity/frequency scale, ranging from 0 (*never*) to 4 (*a lot*), to indicate the extent to which they had experienced each state (e.g., “*I found myself getting upset by quite trivial things*,” “*I found it difficult to relax*”). A mean score was calculated, with higher scores representing greater levels of psychological distress. Psychometric evidence of the DASS has been documented in the literature (e.g., Crawford & Henry, 2003; Szabó (2011)). Good internal consistency reliability (0.84) for the Stress subscale was reported in Sinclair et al. (2012) study with a sample of U.S. adults. The internal consistency α for this psychological stress measure was 0.94 in the current study.

Social support

Instrumental Support and Emotional Support subscales of the NIH Toolbox Adult Social Relationship Scale (Cyranowski et al., 2013) were used to assess perceived availability of functional support in daily tasks if needed (e.g., providing transportation, cooking meals, cleaning), and perceived availability of psychosocial support (e.g., caring and understanding with empathy), respectively. Sample items include: “I have someone to help me if I'm sick in bed (*Instrumental Support*)” and “have someone who will listen to me when I need to talk (*Emotional Support*).” Participants rated each item on a 5-point frequency scale, ranging from 1 (*never*) to 5 (*always*). Evidence of internal reliability (Instrumental: $\alpha = 0.95$; Emotional: $\alpha = 0.97$) and concurrent validity of these subscales has been reported (Cyranowski et al., 2013). In the current study, the internal consistency α was 0.95 for the 8-item Instrumental Support subscale, and 0.97 for the 8-item Emotional Support subscale.

Procedure

The research procedure was approved by the City University of New York (CUNY) institutional review board. A variety of online recruitment methods, including online postings on social media (e.g., Facebook and Twitter), discussion forums (e.g., Reddit), websites (e.g., Psychological Research on the Net), and emails, were used to recruit parents of school-age children (PreK–12th grade) in the United States for this study. Before participating, participants were presented with an internet-based consent form that described the primary goal of the research project and outlined the study protocol (i.e., data management and participant anonymity). Participants consented to participate by completing an online survey that included the instruments presented in the section above. The survey, which took approximately 10–15 min to complete, was presented via the SurveyMonkey platform between April 8, 2020 and June 15, 2020. Participants were given an opportunity to enter a drawing for one of ten \$15 gift cards.

Results

Preliminary Data Analysis

The distributions of the main study variables, including fear of COVID-19, parenting stress, instrumental social support, emotional social support, and psychological distress, did not meet the assumptions of normality. As a result, we calculated Kendall's tau-b (τ_b) correlation coefficients, which are nonparametric statistics, to measure the associations among the study variables. See Table 2 for the findings.

Table 2 Kendall's tau-b Correlational Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mean	SD		
1. Age	-																								41.08	8.35	
2. Gender (0 = Male, 1 = Female)	0.05	-																									
3. Race/ethnicity (0 = White, 1 = POC)	-0.27***	-0.07	-																								
4. Household income	0.37***	0.10	-0.24**	-																							
5. Family status (0 = single-parent, 1 = two-parent)	0.20**	0.05	-0.16*	0.49***	-																						
6. Fear of COVID-19	-0.02	0.04	0.12	0.00	0.00	-																					
7. Problem 1 (1 = yes; 0 = no)	-0.10	0.04	0.01	-0.06	-0.08	0.00	-																				
8. Problem 2 (1 = yes; 0 = no)	-0.19	-0.08	0.09	-0.01	-0.01	-0.01	0.32***	-																			
9. Problem 3 (1 = yes; 0 = no)	-0.09	0.03	0.13a	-0.21**	-0.09	0.00	0.04	0.03	-																		
10. Problem 4 (1 = yes; 0 = no)	-0.17**	0.03	0.06	-0.23**	-0.13a	-0.10	0.16*	0.20**	0.32***	-																	
11. Problem 5 (1 = yes; 0 = no)	-0.20**	-0.04	0.02	-0.23**	-0.04	0.04	0.11	0.43***	0.07	0.23**	-																
12. Problem 6 (1 = yes; 0 = no)	-0.11	-0.13a	0.16*	-0.16*	-0.09	0.09	0.18*	0.35***	0.08	0.30***	0.36***	-															
13. Problem 7 (1 = yes; 0 = no)	0.00	0.15*	-0.02	-0.10	-0.04	0.07	0.29***	0.16*	0.16*	0.26***	0.24**	0.41***	-														
14. Problem 8 (1 = yes; 0 = no)	-0.13*	-0.10	-0.02	-0.19**	-0.22**	0.05	0.08	0.22**	0.14a	0.12a	0.34***	0.22**	0.16*	-													
15. Problem 9 (1 = yes; 0 = no)	0.03	-0.10	-0.01	-0.10	-0.06	0.10	-0.08	-0.03	0.05	0.04	0.01	0.07	0.00	0.18*	-												
16. Problem 10 (1 = yes; 0 = no)	-0.06	0.15*	-0.04	0.16*	0.10	0.07	0.12	0.25**	-0.09	0.05	0.03	0.08	0.18*	0.08	0.12a	-											
17. Problem 11 (1 = yes; 0 = no)	-0.01	0.03	-0.09	0.13a	0.11	0.05	0.11	0.17*	-0.05	0.07	0.02	0.05	0.11	0.09	0.13a	0.62***	-										
18. Problem 12 (1 = yes; 0 = no)	0.01	0.18*	-0.14*	0.18*	0.16*	0.07	0.06	0.15*	-0.06	0.05	-0.02	0.04	0.14a	0.11	0.16*	0.61***	0.56***	-									
19. Problem 13 (1 = yes; 0 = no)	0.10	0.04	-0.06	0.02	-0.09	-0.07	-0.08	-0.09	-0.05	-0.10	-0.17*	-0.03	-0.07	-0.07	-0.06	-0.04	-0.11	-0.08	-								
20. Parenting stress	-0.08	0.09	-0.12*	0.07	-0.03	0.19***	0.07	0.17**	-0.04	0.05	0.18**	0.19**	0.16**	0.19**	0.13*	0.36***	0.30***	0.37***	-0.01	-						1.64	0.98
21. Instrumental social support	0.06	-0.05	0.08	0.17**	0.21**	0.08	-0.10	-0.02	-0.08	-0.16**	-0.10	-0.14*	-0.18**	-0.21**	-0.06	-0.08	-0.03	-0.03	0.02	-0.14**	-					3.87	1.07
22. Emotional social support	0.03	0.09	0.10	0.12*	0.13*	0.07	0.05	-0.02	-0.09	-0.09	-0.03	-0.14*	-0.05	-0.21**	-0.12a	-0.14*	-0.12*	-0.14*	0.05	-0.19***	0.38***	-				3.95	0.93
23. Psychological distress	-0.13*	0.09	-0.10	0.02	-0.05	0.19***	0.09	0.19**	0.03	0.13*	0.20**	0.18**	0.14*	0.17**	0.02	0.27***	0.22***	0.32***	-0.06	0.55***	-0.12*	-0.14**	-			1.15	0.68

Note: *N* = 173–197. Problem 1 = arranged children; Problem 2 = missed work; Problem 3 = child missed free/reduced-cost school meals; Problem 4 = incurred financial cost in excess of typical days; Problem 5 = lost pay or income; Problem 6 = missed appointment with potential financial impact; Problem 7 = missed another kind of important appointment; Problem 8 = felt at risk of losing job; Problem 9 = child missed health services usually provided by school; Problem 10 = felt stressed over planning educational activities for child at home; Problem 11 = felt stressed over planning physical activities for child at home; Problem 12 = felt stressed over maintaining or creating structure and routines at home; Problem 13 = Other

POC People of color

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

The various demographic variables (e.g., age, gender, race/ethnicity, household income, family structure) had different relations with the main study variables (e.g., problems associated with school closure, parenting stress, social support, and psychological distress). The level of fear of COVID-19 was similar across demographic backgrounds. Older age was associated with lower psychological distress, $\tau b = -0.13$, $p = 0.010$. White parents reported higher levels of parenting stress when compared to parents of color, $\tau b = -0.12$, $p = 0.048$. Higher levels of household income were associated with higher levels of instrumental ($\tau b = 0.17$, $p = 0.005$) and emotional ($\tau b = 0.12$, $p = 0.043$) social support. Similarly, parents in two-parent households reported higher levels of social support (Instrumental: $\tau b = 0.21$, $p = 0.001$; Emotional: $\tau b = 0.13$, $p = 0.038$). In addition, income level and race/ethnicity were associated with some of the problems associated with school closure (e.g., child missed free/reduced-cost school meals, parent missed appointment with potential financial impact). The descriptive results regarding the different problems associated with school closure by income level and race/ethnicity are available in a separate study (see Chen et al., 2021).

A parent's fear of COVID-19 was significantly correlated with parenting stress ($\tau b = 0.19$, $p < 0.001$), as well as psychological distress ($\tau b = 0.19$, $p < 0.001$). Parenting stress was related to many consequences of school closures, including missing work ($\tau b = 0.17$, $p = 0.005$), losing pay or income ($\tau b = 0.18$, $p = 0.003$), missing appointments with potential financial impact ($\tau b = 0.19$, $p = 0.002$), missing another kind of important appointment ($\tau b = 0.16$, $p = 0.009$), feeling at risk of losing job ($\tau b = 0.19$, $p = 0.002$), child missing health services usually provided by school ($\tau b = 0.13$, $p = 0.027$), feeling stressed over planning educational activities for child at home ($\tau b = 0.36$, $p < 0.001$), feeling stressed over planning physical activities for child at home ($\tau b = 0.30$, $p < 0.001$), and feeling stressed over maintaining or creating structure and routines at home ($\tau b = 0.37$, $p < 0.001$). Additionally, higher levels of instrumental support ($\tau b = -0.14$, $p = 0.008$) and emotional support ($\tau b = -0.19$, $p < 0.001$) were associated with lower parenting stress.

Similarly, parental psychological distress was associated with consequences of school closures: missed work ($\tau b = 0.19$, $p = 0.002$), incurred financial cost in excess of typical days ($\tau b = 0.13$, $p = 0.034$), lost pay or income ($\tau b = 0.20$, $p = 0.001$), missed appointments with potential financial impact ($\tau b = 0.18$, $p = 0.003$), missed another kind of important appointment ($\tau b = 0.14$, $p = 0.022$), felt at risk of losing job ($\tau b = 0.17$, $p = 0.006$), felt stressed over planning educational activities for child at home ($\tau b = 0.27$, $p < 0.001$), felt stressed over planning physical activities for child at home ($\tau b = 0.22$, $p < 0.001$), and felt stressed over

maintaining or creating structure and routines at home ($\tau b = 0.32$, $p < 0.001$). Instrumental social support ($\tau b = -0.12$, $p = 0.024$) and emotional social support ($\tau b = -0.14$, $p = 0.007$) were negatively correlated with psychological distress. Parenting stress was strongly associated with psychological distress ($\tau b = 0.55$, $p < 0.001$).

Main Analysis

Because the main study variables did not meet the assumptions of normality, we conducted hierarchical multiple regressions on bootstrap samples with 2,000 replicas (Bishara & Hittner, 2015) to examine the predictabilities of fear of COVID-19 (Model 1), problems associated with school closure (Model 2), parenting stress (Model 3), and social support (Model 4) on parental psychological distress, while controlling for demographic variables (i.e., age, gender, race/ethnicity, income level, and family structure) (see Table 3). No multicollinearity was observed (VIFs = 1.00–1.60).

Model 1 showed that fear of COVID-19 was associated with psychological distress, 95% CI [0.13, 0.35]. Model 2, which added the 13 problems associated with school closure in the prediction of psychological distress, provided a better explanation of the variance in parents' psychological distress (R^2 changed from 0.19 to 0.35). Particularly, parents' perceived stress over maintaining or creating structure and routines to guide their children's learning at home contributed additively to parents' psychological distress, 95% CI [0.08, 0.60].

In Model 3, which accounted for 59% of the variance in psychological distress, parenting stress became the dominant and only factor contributing to the prediction of parents' psychological distress, 95% CI [0.33, 0.53], with a medium to large effect size. Moreover, the previously significant relations between fear of COVID-19 and psychological distress, and between stress over maintaining/creating structure and routines at home for children and psychological distress, were no longer significant. Based on Baron and Kenny's (1986) mediation model, the results suggested that parenting stress might mediate the relation between fear of COVID-19 and psychological distress, as well as the relation between maintaining/creating structure and routines at home for children and psychological distress.

Model 4 showed that neither instrumental nor emotional social support added any incremental predictive power to explaining the variance in psychological distress beyond Model 3. In addition, instrumental and emotional support did not meet the conditions proposed by Baron and Kenny (1986) to be considered a mediating factor between parenting stress and psychological distress.

Finally, we used Akaike Information Criterion (AIC) to determine the model fit of Model 1 to Model 4, and the results indicated that Model 3 was the best fit model.

Table 3 Hierarchical regression analysis of predictors of psychological distress (Bootstrapping sample of 2000 replicas)

	Model 1	Model 2	Model 3	Model 4								
	Wald χ^2 (6) = 43.65 <i>p</i> < 0.001 <i>R</i> ² = 0.194	Wald χ^2 (19) = 73.80 <i>p</i> < 0.001 <i>R</i> ² = 0.353, ΔR^2 = 0.159	Wald χ^2 (20) = 230.88 <i>p</i> < 0.001 <i>R</i> ² = 0.586, ΔR^2 = 0.233	Wald χ^2 (22) = 235.36 <i>p</i> < 0.001 <i>R</i> ² = 0.583, ΔR^2 = -0.003								
	Coef. [95% CI]	S.E.	Z	Coef. [95% CI]	S.E.	Z						
(Control variables)												
Fear of COVID-19	0.24 [0.13 0.35]	0.06	4.16***	0.19 [0.07 0.31]	0.06	3.11**	0.09 [-0.01 0.19]	0.05	1.77	0.10 [-0.00 0.19]	0.05	1.89
Problems associated with school closure												
Problem 1 (1 = yes; 0 = no)				0.09 [-0.22 0.40]	0.16	0.58	0.07 [-0.14 0.28]	0.11	0.65	0.05 [-0.18 0.29]	0.12	0.45
Problem 2 (1 = yes; 0 = no)				0.01 [-0.25 0.27]	0.13	0.07	0.03 [-0.19 0.24]	0.11	0.26	0.04 [-0.18 0.25]	0.11	0.32
Problem 3 (1 = yes; 0 = no)				0.16 [-0.29 0.61]	0.23	0.70	0.22 [-0.11 0.55]	0.17	1.31	0.23 [-0.12 0.58]	0.18	1.31
Problem 4 (1 = yes; 0 = no)				0.01 [-0.36 0.38]	0.19	0.07	0.05 [-0.21 0.32]	0.14	0.39	0.06 [-0.22 0.33]	0.14	0.39
Problem 5 (1 = yes; 0 = no)				0.27 [-0.07 0.62]	0.18	1.56	0.06 [-0.23 0.35]	0.15	0.40	0.06 [-0.23 0.36]	0.15	0.42
Problem 6 (1 = yes; 0 = no)				0.29 [-0.26 0.85]	0.28	1.04	0.13 [-0.25 0.50]	0.19	0.65	0.13 [-0.27 0.52]	0.20	0.63
Problem 7 (1 = yes; 0 = no)				-0.02 [-0.31 0.27]	0.15	-0.14	-0.08 [-0.31 0.16]	0.12	-0.64	-0.08 [-0.33 0.17]	0.13	-0.62
Problem 8 (1 = yes; 0 = no)				0.17 [-0.11 0.45]	0.14	1.20	0.10 [-0.13 0.32]	0.12	0.83	0.09 [-0.14 0.32]	0.12	0.76
Problem 9 (1 = yes; 0 = no)				-0.05 [-0.43 0.33]	0.19	-0.25	-0.19 [-0.60 0.22]	0.21	-0.90	-0.21 [-0.69 0.27]	0.24	-0.86
Problem 10 (1 = yes; 0 = no)				0.12 [-0.14 0.39]	0.14	0.91	-0.02 [-0.25 0.20]	0.12	-0.19	-0.03 [-0.26 0.21]	0.12	-0.22
Problem 11 (1 = yes; 0 = no)				-0.00 [-0.25 0.24]	0.13	-0.04	-0.06 [-0.25 0.12]	0.09	-0.65	-0.06 [-0.25 0.14]	0.10	-0.58
Problem 12 (1 = yes; 0 = no)				0.34 [0.08 0.60]	0.13	2.54*	0.16 [-0.06 0.38]	0.11	1.43	0.16 [-0.07 0.40]	0.12	1.36
Problem 13 (1 = yes; 0 = no)				0.04 [-0.21 0.29]	0.13	0.31	-0.04 [-0.24 0.15]	0.10	-0.41	-0.03 [-0.23 0.16]	0.10	-0.33
Parenting stress							0.43 [0.33 0.53]	0.05	8.36***	0.43 [0.32 0.53]	0.05	7.77***
Social support												
Instrumental social support										-0.03 [-0.13 0.07]	0.05	-0.59
Emotional social support										0.01 [-0.10 0.12]	0.06	0.13
AIC	321.55	303.44	233.09	235.52								

Note: The Akaike Information Criterion (AIC) of Model 1 to Model 4 showed Model 3 as the best fitting model. Problem 1 = arranged children; Problem 2 = missed work; Problem 3 = child missed free/reduced-cost school meals; Problem 4 = incurred financial cost in excess of typical days; Problem 5 = lost pay or income; Problem 6 = missed appointment with potential financial impact; Problem 7 = missed another kind of important appointment; Problem 8 = felt at risk of losing job; Problem 9 = child missed health services usually provided by school; Problem 10 = felt stressed over planning educational activities for child at home; Problem 11 = felt stressed over planning physical activities for child at home; Problem 12 = felt stressed over maintaining or creating structure and routines at home; Problem 13 = Other

Coef. [95% CI] 95% confidence interval for a coefficient

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

Discussion

Using data collected from parents of school-age children during the first three months of the COVID-19 pandemic in the US, this study investigated the relations between COVID-19-related stressors, parenting stress, and parental well-being. The preliminary results highlight the unique challenges associated with parenting school-age children during the pandemic and their potential impact on parents' stress and well-being.

In line with emergent research (e.g., Brown et al., 2020; Chung et al., 2020; Hiraoka & Tomoda, 2020), our findings suggest that COVID-19-related stressors were associated with perceived parenting stress. The closures of schools, childcare services, and workplaces have led many parents to work remotely while caring for their children at home, straining the role of parenting. Moreover, loss of employment, reduced wages, and other financial difficulties may further exacerbate the burden of parenting on some parents (Nepl et al., 2016). In the present study, we found that some parents of school-age children felt stressed over constructing positive learning environments for their children at home. In particular, our results suggest that the stress of maintaining or creating structures and routines to guide children's learning at home during the pandemic might create a burden on parents of school-age children.

The results are consistent with Abidin's (1992) parental stress model that addresses the influence of perceived environmental stressors and demands associated with parenting roles on parental stress. As a result of school closures due to the public health crisis of COVID-19, many parents of school-age children found themselves expected to assume multiple new roles, such as teacher, tutor, schedule keeper, playmate, and entertainer relative to their children, in addition to carrying out their daily household and professional or job responsibilities. According to recent survey data reported by the University of Oxford (2021), parents of younger children (10 or younger) in particular experienced higher levels of stress during COVID-19 lockdowns than those of older children, and about 40% of parents of primary school students in particular felt anxious about homeschooling due to school closures. It is likely that younger school-age children in lower grade levels require more direct, immediate, and frequent attention and assistance than do older children, resulting in heightened parenting demands and stress.

Similar to a recent study by Russell et al. (2020), we observed that caregiver burdens during the COVID-19 pandemic play a significant role in parental psychological well-being. Although fear of COVID-19 and many stressors related to school closures were associated with parents' psychological distress, stress related to parenting school-age children during the pandemic was the dominant predictor of

parents' well-being. Both major life events and daily hassles in parenting can contribute to parental emotional well-being, with some evidence suggesting that parenting stress from daily hassles may have the stronger influence on parental well-being (Jennings and Dietz, 2007). As parents struggle with balancing parenting and work while grappling with following stay-at-home guidelines and other public health safety measures, daily hassles in parenting may have a more direct and immediate influence on parents' psychological well-being than major life events. However, readers should note that the relation between parenting stress and parental well-being can be bi-directional (Jennings & Dietz, 2007). Parents' mental health may in turn contribute to parenting stress (e.g., Brown et al., 2018), especially during a time of crisis (e.g., Brown et al., 2020).

Consistent with the literature (e.g., Griffith, 2020; Parkes et al., 2015; Sharda et al., 2019), we found that social support was associated with parenting stress and parental psychological well-being. Parents with higher levels of perceived instrumental and emotional support reported lower levels of parenting stress and psychological distress. Unlike the general parenting literature supporting the role of social support in buffering the effects of stress on well-being (cited in Sharda et al., 2019), our findings suggest that social support does not necessarily mediate the relation between parenting stress and parental well-being during the COVID-19 pandemic. According to Masten's (2014) resilience models, social support may affect psychological outcomes directly as a main effect, or indirectly through mediating or moderating the effects of stressors on well-being. Our findings are aligned with some studies (e.g., Raikes & Thompson, 2005; Robinson & Weiss, 2020; Sharda, 2019) suggesting that social support may be related to parental well-being directly rather than as a mediator. It is also possible that parenting stress was so heightened during the COVID-19 pandemic that general social support might not be sufficient to alleviate the unique parenting demands on parents of school-age children. A recent study suggested that only high levels of social support may buffer mental health risks during COVID-19; however, moderate social support may not effectively mitigate such risks especially when individuals have low psychological resilience to significant adversity (Li et al., 2021).

Social isolation during the COVID lockdown further added layers of difficulty to the availability and delivery of social support. There is some research evidence suggesting that the mediating effect of social support may depend upon how social support is operationalized and delivered (e.g., Drogomyretska et al., 2020; Hasson-Ohayon et al., 2018; Shepherd et al., 2020). The types of emotional and instrumental support that parents need during COVID-19 lockdowns may be pandemic-specific and time-sensitive. These supports may differ from those needed prior to the

pandemic. Parents of school-age children may need social support that directly and specifically targets stressors related to school closures and parenting under quarantine (e.g., Abramson, 2021).

There are some limitations inherent in this study. White women from higher income clusters comprised the majority of the participants, with fathers and parents from lower income households and parents of color being disproportionately underrepresented in the sample. The sample included parents residing in 26 states in the United States, but more than half were from New York State. Our online recruitment efforts might not have reached families that had no or limited access to the internet or to the sites where our online messages were posted. As a result, the sample might not represent the entire U.S. population. We controlled demographic background in our data analysis to minimize the effects of a non-representative sample, but the results of the current study should be considered preliminary due to the use of a small, non-random sample. This study's generalizability is uncertain, and the findings need to be further validated using a large, representative random sample.

Many parents had two or more school-age children at different ages in this sample, we were unable to directly examine the role of child age on parenting stress and psychological distress. Child characteristics, such as disability status and educational placement, were also not assessed in this study.

The measures used in this study did not provide comprehensive and detailed coverage of stressors and challenges facing parents of school-age children during COVID-19. Even though we assessed both instrumental support and social support, our instruments might not have captured the unique needs of parents of school-age children during this unprecedented public health crisis. For example, research suggests that children's behavioral problems (e.g., Kochanova et al., 2021), disabilities (e.g., Ren et al., 2020), and health issues (e.g., Cousino & Hazen, 2013) can lead to increased parenting stress. Thus, future research may address the roles of child characteristics in contributing to parenting stress and parental well-being during a pandemic or other community-based disasters, particularly those that result in short-term or long-term school closures. Parent and family characteristics, such as parental physical (e.g., Shea & Moore, 2018) and mental health (e.g., Pinquart, 2018), parenting style and practice (e.g., Gouveia et al., 2016), parent-child relationship (e.g., Gillis & Roskam, 2019), family cohesion and adaptability (e.g., Gleeson et al., 2016), and family resources (e.g., Gleeson et al., 2016) may be risk or protective factors contributing to parenting stress during times of community-based adversities. Future research needs to further examine the roles of these family characteristics in potentially exacerbating or protecting parenting stress and parental well-being during pandemic-related lockdowns. More comprehensive measures of parental well-being are also needed in future study to understand the

specific effects of COVID-19 on parents' adjustment, such as anxiety and depression. In addition, qualitative research is needed to provide a more in-depth understanding of the experiences of parents of school-age children and their challenges and specific needs for support.

Due to the cross-sectional nature of this study, we were unable to control for prior experiences of participants or to examine the temporal precedence of variables. Thus, we could not draw conclusions about the causal relation between predictors (e.g., problems associated with school closure) and outcomes (e.g., parental distress), as well as the mediating effect of social support (Maxwell & Cole, 2007). There might be other mediators in the relation between parenting stress and parental well-being that we did not assess. Future cohort or longitudinal studies that include other theoretically relevant factors are needed to enable a more comprehensive understanding of parental stress and well-being during a public health crisis. In addition, this study's exclusive use of self-report measures inherently posits potential reporting biases and limitations to the findings. A multi-modal or multi-method approach that combines self-report data with other behavioral and physiological information should be considered in further research to provide a more global picture of parenting experiences during a public health emergency or pandemic.

The findings have implications for policy and practice. Parents of school-age children experienced unprecedented challenges during the COVID-19 pandemic, resulting in heightened parenting stress. School closures in particular exacerbated the parenting burden, which could take a mental health toll on parents of school-age children. Parents may need a lot of financial and emotional support to alleviate their psychological distress. In addition, support specifically targeting the reduction of parenting stress and demands regarding support of their children's schooling at home may be needed. Schools may work with parents collaboratively to set and adjust reasonable expectations and learning goals for children. Incorporating mindfulness practice, which emphasize paying attention to the present moment, identifying priorities, recognizing limits, and accepting outcomes without judgment, into parenting may help parents navigate stress more effectively during the pandemic (e.g., Campbell et al., 2017; Fuller & Fitter, 2020). Helping parents reappraise their perspectives of the pandemic and lockdowns (e.g., opportunities to spend much-needed time to connect with their children) can provide a resource to cope parenting stress during COVID-19 (Abramson, 2021). Parents may benefit from evidence-based behavioral programs for parenting to grow their parenting skills, which can provide a sense of efficacy in reducing parenting-related stressors (Abramson, 2021). Parents also need timeouts to breathe, engage in self-care, and ground themselves (American Psychological Association, 2020; Heifetz, 2020).

Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

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