



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Journal of Affective Disorders Reports

journal homepage: [www.elsevier.com/locate/jadr](http://www.elsevier.com/locate/jadr)

Research Paper

# Social distancing and anxiety among female caregivers of children ages zero-to-five during coronavirus disease (COVID-19) lockdown in the United States

Philip Baiden\*, Catherine A. LaBrenz, Erin Findley

School of Social Work, The University of Texas at Arlington, 211 S. Cooper St., Box 19129, Arlington, TX 76019, United States

## ARTICLE INFO

**Keywords:**

Social distancing  
 withdrawal from activities of interest  
 anxiety  
 mental health  
 caregivers  
 COVID-19

## ABSTRACT

**Background:** Past studies have linked measures of social isolation to mental health among caregivers of children. As people across the world adjust to social distancing measures, there is a need to understand consequences of social distancing measures on mental health. Thus, the objective of this study is to examine the association between adherence to social distancing measures and feeling worried/anxious among female caregivers of children ages zero-to-five.

**Methods:** Data for this study came from an online survey that was administered between May and June 2020 to understand stress and mental health among caregivers of children during the COVID-19 pandemic. A sample of 358 female caregivers was analyzed using binary logistic regression with feeling worried/anxious as the outcome variable.

**Results:** More than a third of the female caregivers (35.2%) reported feeling worried/anxious during the past month and about 42% reported strictly adhering to social distancing measures. Controlling for the effect of other factors, caregivers who reported strictly adhering to social distancing had 1.86 times higher odds of feeling worried/anxious when compared caregivers who were not strictly adhering to social distancing (AOR=1.86, 95% C.I.=1.07–3.24). Caregivers who felt bothered by withdrawal from activities of interest had 4.11 times higher odds of reporting feeling worried/anxious (AOR=4.11, 95% C.I.=2.32–7.24).

**Conclusions:** As COVID-19 pandemic continues to evolve, it is important to build community response to better support caregivers of infants and young children. Implications for practice, policy, and research as they relate to caregiver's mental health are discussed.

## 1. Introduction

Since March 2020, millions of Americans across the US have been impacted by the novel Coronavirus Disease 2019 (COVID-19) and its subsequent restrictions and disruptions to daily life. As people across the world adjust to social distancing, shelter-in-place, or even more extreme quarantine measures, experts have been tasked with weighing physical health risks of opening too soon with the risks to mental health, economic stability, and overall well-being. Considering that widespread measures have only been implemented since March 2020, there are few studies that have empirically examined mental health and well-being during COVID-19. Nonetheless, there have been recent calls to better understand mental health and how to mitigate negative mental health outcomes, such as anxiety or depression, during the pandemic (Brooks et al., 2020; Holmes et al., 2020; Pfefferbaum and North, 2020; Wang et al.,

2020). This paper examines the association between adherence to social distancing and reports of feeling worried/anxious among caregivers of children ages zero-to-five during COVID-19 pandemic in the US.

Parenting and caregiving is a challenging and stressful job (Deater-Deckard, 2008; Janisse et al., 2009). Some studies have shown that, just as exposure to job stress can lead to job burnout, exposure to excessive parenting stress can lead to parental burnout (Mikolajczak et al., 2018; Sánchez-Rodríguez et al., 2019). Mikolajczak et al. (2018) examined the consequences of parental burnout on child-related outcomes among a sample of 1551 parents from Belgium and found that parental burnout had a statistically similar effect as job burnout on parental substance use, sleep problems, and suicidal ideation. They also found that compared to parents who did not feel burnout, parents who reported feeling burnout were more likely to resort to harsh disciplinary measures. Other studies have also found that stress resulting from parenting could lead to

\* Corresponding author.

E-mail address: [philip.baiden@uta.edu](mailto:philip.baiden@uta.edu) (P. Baiden).<https://doi.org/10.1016/j.jadr.2021.100154>

Received 7 October 2020; Received in revised form 18 April 2021; Accepted 29 April 2021

Available online 5 May 2021

2666-9153/© 2021 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

parental burnout (Lindström et al., 2011; Norberg, 2010; Roskam et al., 2017). These studies have shown that similar to job burnout, parental burnout is stress-related and can manifest in three forms: emotional exhaustion, emotional distance, and emotional disengagement (Sánchez-Rodríguez et al., 2019). *Emotional exhaustion* refers to the state of feeling emotionally drained and exhausted. *Emotional distance* refers to the parent's emotional distance from the child. *Emotional disengagement* refers to a lack of motivation and fulfillment by a parent in performing their role as a parent (Sánchez-Rodríguez et al., 2019).

Parental burnout may be more common during early childhood, given the level of dependence and need that children present during the first years of life (Mikolajczak et al., 2018). In parallel, infants and young children may be particularly vulnerable to the impacts of parental stress and burnout, given the rapid brain formation and development that occurs during the first few years of life (Tierney and Nelson III, 2009). In addition, infants and younger children are often not visible in other systems, such as schools, and therefore may not have a regular check-in from a teacher or counselor. Thus, it is particularly important to understand how families with infants and young children are faring during the pandemic.

### 1.1. Mental health during crises

Epidemics and pandemics have short- and long-term adverse effects on survivors' mental health (Holmes et al., 2020; Mitchell et al., 2016). Evidence from past epidemics such as human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS; Amare et al., 2018; Betancourt et al., 2013; Catalan et al., 2011; Ebuenyi et al., 2018; Hartog et al., 2020), severe acute respiratory syndrome (SARS; Yi-Ching et al., 2006), influenza A virus subtype H1N1 (Page et al., 2011), Zika (de Souza et al., 2018), and Middle Eastern Respiratory Syndrome (MERS; Jeong et al., 2016), suggest increases in rates of mental health symptoms such as anxiety, depression, and posttraumatic stress disorder (PTSD). More recently, studies have found an increase in rates of anxiety following the Ebola outbreak in the general population (Cénat et al., 2020; James et al., 2019; Waterman et al., 2018). With respect to COVID-19, there is emerging evidence of widespread fear of infection accompanied by psychological distress, particularly during the initial phase of the pandemic (Ahorsu et al., 2020; Harper et al., 2020; Rauch et al., 2020; Satici et al., 2020; H. Wang et al., 2020). Qiu et al. (2020) examined psychological distress among Chinese people and found that more than a third of adults experienced severe levels of anxiety and stress-related symptoms as a result of COVID-19.

With the advent of COVID-19, a number of non-pharmaceutical measures were put in place to prevent the spread of COVID-19. One such measure adopted by the Centers for Disease Control and Prevention (CDC) (Centers for Disease Control and Prevention 2020) was social distancing, with the goal of "flattening the curve" to avoid overwhelming the health system. Social distancing is a community infection control measure that seeks to reduce the frequency and intensity of close contact with other humans by closing public places, avoiding large gatherings, and staying at least six feet apart from members who are not from one's household. Previous empirical research provides us with rich data on the adverse effects of social distancing on physical and overall mental health well-being (Hawthorne, 2008; Perissinotto et al., 2012; Smith and Victor, 2019; Smith and Christakis, 2008; Valtorta et al., 2016; Wang et al., 2019; Ypsilanti et al., 2020). Holt-Lunstad et al. (2010) and Ikeda and Kawachi (2010) have also provided a detailed review of the impact of social isolation on health and mental health outcomes.

Conversely, social support has been found to buffer the effect of many health and mental health problems (see e.g., Baiden et al., 2017; Berkman et al., 2014; Holt-Lunstad et al., 2010; Kawachi and Berkman, 2014; LaBrenz et al., 2019). Social support has been posited to affect health and mental health through two main pathways: 1) as a direct effect on health and mental health and 2) as a buffer against stressful life events (Cohen and Wills, 1985). As a direct effect on health and

mental health, the perception of the availability of support offers protection to individuals. The source, quantity, or quality of the amount of resources available to individuals could go a long way in determining the mental health and well-being of an individual, especially in times of crisis (Cohen and Wills, 1985). As a buffer, social support acts to protect the mental health of individuals, particularly individuals who are faced with adverse life events such as maltreatment or the loss of a loved one (Cohen and Wills, 1985). Systematic reviews and meta-analyses have documented the positive effect of social support in enhancing mental health well-being (Bigby, 2012; Casale and Wild, 2013; Holt-Lunstad et al., 2010).

### 1.2. Current study

To the best of our knowledge, the consequences of social distancing measures on mental health among caregivers with infants and young children have not been investigated. A study that examined distress and mental health symptomatology among pregnant women from Quebec, Canada, found that women who were pregnant during COVID-19 had higher rates of depressive or anxiety symptoms than their counterparts who were pregnant prior to COVID-19 (Berthelot et al., 2020). Griffith (2020) called for strategies to support caregivers during COVID-19, given that caregiver stress has been linked to child maltreatment. Thus, the primary objective of this paper is to examine the association between adherence to social distancing measures and feeling worried/anxious among female caregivers of children ages zero-to-five. We hypothesized that: 1) caregivers who strictly adhere to social distancing measures would report higher odds of feeling worried/anxious when compared to caregivers who do not strictly adhere to social distancing measures; 2) caregivers who felt bothered by withdrawal from activities of interest would report higher odds of feeling worried/anxious when compared to caregivers who do not feel bothered by withdrawal from activities of interest.

## 2. Methods

### 2.1. Participants

Data were utilized from an online survey that was developed and administered by the authors of this study to examine caregiver stress among caregivers of children ages zero-to-five during the COVID-19 pandemic. The survey consisted of questions the authors developed related to adherence to social distancing, challenges since COVID began, service utilization, and parenting stress. Participants were recruited via social media and childcare centers to target caregivers with children under six years of age. The survey was completed online between May and June 2020 using Qualtrics. The analysis presented in this study focuses on female caregivers of children ages zero-to-five in the US. A total of 496 female full-time/primary caregivers (most of whom were the biological mother) with at least one child between the ages of zero-to-five years completed the online survey between May and June 2020. However, the analysis presented in this study focuses on respondents with complete data on all the variables included in the multivariable logistic regression analysis. This resulted in an analytic sample of 358 respondents. Demographic characteristics of the analytic sample ( $N = 358$ ) are presented in Table 1. The study was approved by the Institutional Review Board at the first author's institution.

### 2.2. State and Federal restrictions during the survey

In the US, most states started implementing measures against COVID-19 after the US president declared a national emergency on March 13, 2020. On March 15, 2020, the CDC cautioned against holding or attending large gatherings of more than 50 people, including sporting events, festivals, conferences, concerts, weddings, and religious services for the next eight weeks. Individuals were advised to cancel or postpone these

**Table 1**  
Sample characteristics (n = 358).

Variables	Frequency (%)
<b>Outcome variable</b>	
Felt worried/anxious	232 (64.8)
No	126 (35.2)
Yes	
<b>Explanatory variables</b>	
Adherence to social distancing	
Not strictly adhering	207 (57.8)
Strictly adhering	151 (42.2)
Bothered by withdrawal from activities of interest	
No	270 (75.4)
Yes	88 (24.6)
<b>Covariates</b>	
Age	
18–24 years	11 (3.1)
25–34 years	172 (48.0)
35–44 years	167 (46.7)
45 years and above	8 (2.2)
Race/ethnicity	
White	289 (80.7)
Black/African American	6 (1.7)
Hispanic	39 (10.9)
Asian	15 (4.2)
Other	9 (2.5)
Education	
High school or less	10 (2.8)
Some college or associate degree	71 (19.8)
Bachelor's degree	121 (33.8)
Graduate or Professional degree	108 (30.2)
Doctorate	48 (13.4)
Household income	
Less than \$20,000	9 (2.5)
\$20,000-\$39,999	26 (7.3)
\$40,000-\$59,999	42 (11.7)
\$60,000-\$79,999	45 (12.6)
\$80,000 and above	236 (65.9)
Childcare issues during COVID-19	
No	252 (70.4)
Yes	106 (29.6)
Lack of support during COVID-19	
No	297 (83.0)
Yes	61 (17.0)
Mental health issues during COVID-19	
No	310 (86.6)
Yes	48 (13.4)
Number of children in household, M (SD)	2.91 (0.86)
Total parenting stress, M (SD)	42.02 (8.60)

events in order to avoid community spread of COVID-19. To practice social distancing, individuals were advised to limit face-to-face contact with others and stay at least six feet away from other people who are not from the same household.

### 2.3. Measures

#### 2.3.1. Dependent variable

The outcome variable examined in this study was feeling worried/anxious and was measured as a binary variable. The original variable asked caregivers “Over the past month, how often have you felt worried/anxious” with the following response options “0 = None of the time”, “1 = A little of the time”, “2 = Some of the time”, “3 = Most of the time, and “4 = All of the time.” For the purposes of this study, caregivers who reported feeling worried/anxious “most of the time” or “all of the time” were grouped together and coded as 1; otherwise, they were coded as 0.

#### 2.3.2. Explanatory variables

The main explanatory variables examined in this study were adherence to social distancing measures and being bothered by withdrawal from activities of interest. Adherence to social distancing measures was

measured based on the question “On a scale of 1-5, with 5 being “very strict” and 1 being “not at all strict,” please rate your level of adherence to social distancing measures during COVID-19.” Caregivers who indicated “strictly adhering to social distancing measures” were recoded as 1; otherwise, they were recoded as 0. Being bothered by withdrawal from activities of interest was measured as a binary variable based on response to the question “Over the past month, how often have you been bothered by withdrawal from activities of interest—e.g., long-standing activities, being with family/friends etc.” Caregivers who reported being bothered by withdrawing from activities of interest “most of the time” or “all of the time” were grouped together and coded as 1; otherwise, they were coded as 0.

#### 2.3.3. Covariates

Other covariates examined in this study included education, household income, problems with childcare during COVID-19, lack of support during COVID-19, mental health issues during COVID-19, and parenting stress. Level of education was measured as a nominal variable into the following categories: “0 = High school or less”, “1 = Some college or associate degree”, “2 = Bachelor's degree”, “3 = Graduate or professional degree”, and “4 = Doctorate”. Household income was measured as a nominal variable into the following categories: “0 = Less than \$20,000”, “1 = \$20,000-\$39,999”, “2 = \$40,000-\$59,999”, “3 = \$60,000-\$79,999”, and “4 = \$80,000 and above”.

Caregivers were asked “On a scale of 1-5, with 5 being “very much a problem” how much of an issue have the following been in your household from March 2020 on (during COVID-19 pandemic): Childcare, lack of support, and mental health issues. For the purposes of this study, caregivers who indicated “often a problem” or “very much a problem” were recoded as 1; whereas, parents who indicated “not a problem at all”, “a little bit of a problem”, or “somewhat a problem” were recoded as 0.

Caregiver stress was measured as a continuous variable using the Parenting Stress Scale (PSS; Berry and Jones, 1995). The PSS is an 18-item self-report measure designed to assess parenting stress across domains of rewards, stressors, lack of control, and satisfaction (Berry and Jones, 1995). Caregivers were asked to indicate on a five-point Likert scale ranging from “1 = Strongly Disagree” to “5 = Strongly Agree” the extent to which they agree or disagree with the following statement, e.g., “I am happy in my role as a parent”, “There is little or nothing I wouldn't do for my child(ren) if it was necessary”, “Caring for my child(ren) sometimes takes more time and energy than I have to give”, “The behavior of my child(ren) is often embarrassing or stressful to me”, “If I had it to do over again, I might decide not to have child(ren)”, “I am satisfied as a parent”, etc. Some items were reverse-scored so that high scores would indicate higher levels of caregiver stress. Scores on the PSS are then summed to arrive at a total score ranging from 18 to 90, with higher scores indicating severe caregiver stress. The PSS has been used in various studies and has been found to have strong psychometric properties (Berry and Jones, 1995; Louie et al., 2017; Zelman and Ferro, 2018). In the present study, Cronbach's alpha coefficient for the PSS was  $\alpha = 0.87$ , indicating high internal consistency among the 18 items, and the results indicate that deleting items from the scale would not improve the overall Cronbach's alpha coefficient.

#### 2.3.4 Demographic variables

The following demographic variables were also taken into account: age, race/ethnicity, and number of children in household. Age was measured as a nominal variable into “0 = 18-24 years”, “1 = 25-34 years”, “2 = 35-44 years”, and “3 = 45 years and above”. Race/ethnicity was also measured as a nominal variable into the following categories “0 = non-Hispanic White”, “1 = Black/African-American”, “2 = Hispanic”, “3 = Asian”, and “4 = Other race/ethnicity”. Lastly, number of children in household was measured as a continuous variable.

## 2.4. Data analyses

Descriptive statistics were first performed using percentages for the categorical variables and mean and standard deviation for number of children in household and PSS. The main analysis involved the use of binary logistic regression to examine the association between adherence to social distancing and being bothered by withdrawal from activities of interest and feeling worried/anxious while controlling for the effects of other covariates. Binary logistic regression was chosen as it is more robust in predicting binary outcome variables (in this study, feeling worried/anxious) with independent variables that could be measured as continuous or categorical variables (Tabachnick & Fidell, 2007). In the logistic regression, we present the adjusted odds ratios (AOR) to indicate the likelihood of reporting anxiety based on the explanator variable or each covariate in the model. For odds ratio, any number greater than one signifies that the factor increases the likelihood of anxiety, while any number less than one signifies that the factor decreases the likelihood of anxiety. All variables were entered into the model using the *enter* procedure. Model fitness was assessed using the Wald chi-square and the pseudo R square. Variables were considered significant if the *p*-value was less than .05. Adjusted odds ratios (AOR) and 95% C.I. were reported. All statistical analyses were executed using Stata 14.

## 3. Results

### 3.1. Sample characteristics

Table 1 shows the general distribution of the variables examined in this study. More than a third of the caregivers (35.2%) reported feeling worried/anxious during the past month. About 42% of the caregivers reported strictly adhering to social distancing measures. About one in four caregivers (24.6%) reported being bothered by withdrawal from activities of interest. Most of the caregivers self-identified as White (80.7%), 10.9% self-identified as Hispanic, 4.2% as Asian, 1.7% as Black/African American, and 2.5% as “other race/ethnicity”. The sample was highly educated, with a third of the caregivers having bachelor’s degree, 30.2% having graduate or professional degree, and 13.4% having a doctorate degree. Close to two-third of the caregivers (65.9%) had a household income of \$80,000 and above. Approximately one in three (29.6%) caregivers reported problems with childcare during, 17% reported a lack of support, and 13.4% reported mental health issues during COVID-19. The average number of children per household was 2.91 (*SD* = 0.86), and the average PSS score was 42.02 (*SD* = 8.60).

### 3.2. Multivariable logistic regression results

Table 2 shows the results of the multivariable logistic regression examining the association between adherence to social distancing and being bothered by withdrawal from activities of interest and feeling worried/anxious. Both model fitness indices indicated that the logistic regression model was fit. The Wald chi-square test statistic was significant ( $\chi^2 = 80.69$ , *df* = 22, *p* < .001). Together, all the variables explained 26.36% of the variance in feeling worried/anxious. Compared to caregivers who were not strictly adhering to social distancing, caregivers who reported strictly adhering to social distancing had 1.86 times higher odds of feeling worried/anxious (AOR = 1.86, *p* = .029, 95% C.I. = 1.07–3.24). Caregivers who felt bothered by withdrawal from activities of interest had 4.11 times higher odds of reporting feeling worried/anxious when compared to their counterparts who were not bothered by withdrawal from activities of interest (AOR = 4.11, *p* < .001, 95% C.I. = 2.32–7.24).

Age, race/ethnicity, education, and number of children in the household were not significantly associated with feeling worried/anxious. With respect to household income, caregivers who made \$60,000–\$79,999 had 92% lower odds of feeling worried/anxious when compared to their counterparts who made less than \$20,000 (AOR = 0.08,

*p* = .042, 95% C.I. = 0.01–0.91). No other income category was significantly associated with feeling worried/anxious. Caregivers who reported having problems with childcare during COVID-19 had more than three-fold higher odds of feeling worried/anxious when compared to their counterparts who had no problem with childcare during COVID (AOR = 3.10, *p* < .001, 95% C.I. = 1.64–5.86). Caregivers who reported having problems with mental health issues during COVID-19 had almost ten-fold higher odds of feeling worried/anxious when compared to their counterparts who had no problem with mental health issues during COVID (AOR = 9.50, *p* < .001, 95% C.I. = 4.00–22.57). Lastly, each one-unit increase in PSS score increased feeling worried/anxious by a factor of 4% (AOR = 1.04, *p* = .040, 95% C.I. = 1.01–1.08).

## 4. Discussion

This study examined the association between adherence to social distancing measures and maternal anxiety. These findings can contribute to our knowledge of caregivers’ mental health during the COVID-19 pandemic. As the debate continues about opening up or easing restrictions, it is important to weigh physical health with caregivers’ mental health and overall well-being. Indeed, over one-third of the sample reported feeling worried/anxious recently, almost one-third reported issues with childcare during COVID-19, and over one in ten reported mental health issues during COVID-19. This is congruent with a recently released report from the CDC that found high rates of mental health issues, including almost one-third that reported anxiety or depression, with the highest mental health issues among unpaid adult caregivers and young adults (Czeisler et al., 2020). Thus, there is a need to support families, especially those in caregiving roles and with additional childcare responsibility during the current crisis.

The result from our study supported our main hypothesis, in that adherence to social distancing was positively associated with feeling anxious. Although few other empirical studies have been conducted of caregivers’ mental health during COVID-19, some experts have called for policies to mitigate negative mental health issues that could develop or be exacerbated by social distancing (Venkatesh and Edirappuli, 2020). As the number of caregivers reporting mental health problems increases during the pandemic (Patrick et al., 2020), it is important to provide support and enhance family resilience. Moreover, participants who reported being bothered by withdrawal from activities of interest were more likely to report feeling worried/anxious. This withdrawal from activities of interest has the tendency to lead to boredom, frustration, and a sense of isolation (Watson and Nesdale, 2012). It is important that public health messages focus on reminding individuals about what they can do to ease off boredom with practical advice on stress management and coping techniques. Utilizing one’s social network, even remotely, has the potential to ease boredom and anxiety (Manuell and Cukor, 2011). The use of mobile technology such as Skype, FaceTime, Zoom, and the ubiquitousness of social media could play a significant role in communicating with friends and family members far away. Therefore, providing reliable and free Wi-Fi and internet access where individuals can communicate directly with their friends and loved ones and reassure them that they are doing well could go a long way in reducing stress and anxiety (Brooks et al., 2020).

In addition to adherence to social distancing, overall caregiver stress and childcare issues during COVID-19 were also linked to feeling worried/anxious. Notably, the average caregiver stress score among mothers in this sample was slightly higher than the average in prior clinical samples of mothers whose infants presented with sleep disturbances (Ford, 2011), but slightly lower than a prior clinical sample of mothers screened into an intervention because of preschool behavioral or developmental difficulties (Griffin et al., 2010). Thus, although caregivers in our sample were stressed, the average caregiver stress was not greater than some samples in prior literature. Concerning childcare, Patrick and colleagues (2020) also found that childcare issues impacted a substantial proportion of families during COVID-19. Indeed, prior literature has

**Table 2**  
Multivariable logistic regression results predicting feeling worried/anxious ( $n = 358$ ).

Variables	AOR (95% C.I.)	p-value
Age (18–24 years)		
25–34 years	0.35 (0.05–2.42)	.285
35–44 years	0.43 (0.06–3.11)	.405
45 years and above	0.57 (0.05–6.91)	.658
Race/ethnicity (White)		
Black	2.53 (0.39–16.57)	.334
Hispanic	1.93 (0.85–4.40)	.116
Asian	1.22 (0.37–4.03)	.739
Other	0.60 (0.08–4.74)	.632
Education (High school or less)		
Some college or associate degree	2.08 (0.36–12.06)	.416
Bachelors degree	1.71 (0.30–9.77)	.545
Graduate or Professional degree	1.49 (0.26–8.56)	.657
Doctorate	1.69 (0.28–10.26)	.571
Household income (Less than \$20,000)		
\$20,000–\$39,999	0.10 (0.01–1.07)	.057
\$40,000–\$59,999	0.14 (0.01–1.50)	.105
\$60,000–\$79,999	0.08 (0.01–0.91)	.042
\$80,000 and above	0.13 (0.01–1.30)	.082
Number of children in household	0.81 (0.60–1.09)	.167
Childcare problem during COVID-19 (No)		
Yes	3.10 (1.64–5.86)	.001
Lack of support during COVID-19 (No)		
Yes	1.28 (0.57–2.87)	.545
Mental health issues during COVID-19 (No)		
Yes	9.50 (4.00–22.57)	< .001
Total Parenting Stress	1.04 (1.01–1.08)	.040
Adherence to social distancing (Not strictly adhering)		
Strictly adhering	1.86 (1.07–3.24)	.029
Bothered by withdrawal from activities of interest (No)		
Yes	4.11 (2.32–7.27)	< .001

Note: Reference category is indicated in bracket.

R-square 0.2636

Wald chi-square ( $\chi^2 = 80.69$ ,  $df = 22$ ,  $p < .001$ )

found that access to childcare can provide caregivers with other resources, such as community or neighborhood connections (Small, 2006), as well as formal or informal networks (Dolan and Sherlock, 2010). Prior research has found that parental satisfaction with daycare decreases overall caregiver stress (Bigras et al., 2012). Already, there have been reports of the disparate impact of COVID-19 and childcare on females (Burki, 2020). Indeed, gendered differences and challenges with access to childcare and disruptions to work have been exacerbated and made more visible during the current pandemic. Thus, it is important to continue to support childcare accessibility and provide options for mothers who may not have other support networks readily available.

### Limitations

The findings of this study are not without limitations. First, the data come from a small convenience sample and therefore are not necessarily generalizable to the entire US population. Second, the sample was largely homogenous, with a high proportion of White, well-educated, most of whom were in heterosexual relationships with two full-time professional incomes. Thus, it is also possible that the resources available to this sample may not be representative of all caregivers in the US. Third, we only collected caregiver-reported information. Future research could include reports of child behavior or mental health, as well as reports from other sources such as teachers. Lastly, the cross-sectional nature of the data does not allow for any causal inferences; thus, only an association can be inferred. One possibility to explore in future research is whether mothers with previously high levels of anxiety are more likely to adhere strictly to social distancing measures in the first place. Having at least one measurement time point before COVID-19 lockdown and another measurement time point during COVID-19 lockdown would have afforded us a much better opportunity to understand the association between social distancing measures and feeling worried/anxious.

### Implications

The current study contributes towards a burgeoning number of international studies calling for a multidisciplinary approach to better understand the economic, social, and psychological impact of COVID-19 (Brooks et al., 2020; Pieh et al., 2020; C. Wang et al., 2020). Specifically, a recent review of the psychological impact of social distancing measures underscores the wide-ranging and long-lasting impact of social distancing and calls for enhanced monitoring of reported rates of mental health problems such as depression, anxiety, substance use, and suicidal behaviors so as to better inform global responses to the pandemic (Brooks et al., 2020). In the current study, we found that adherence to social distancing measures, having childcare and mental health difficulties, and being bothered by withdrawal from activities of interest were salient factors associated with feeling worried/anxious during COVID-19. The findings of this study are not to imply that non-pharmacological interventions such as social distancing should not be used, as the ultimate consequences of not using social distancing measures and allowing the virus to spread might be more devastating. However, the long-term economic, mental health, and developmental impact of strict social distancing should be weighed with the physical health benefits.

The findings from this study can help inform policy, practice, and future research to better understand how to support families during COVID-19, as well as coping with the pandemic. From a policy standpoint, as local communities, states, and the federal government continue to monitor COVID-19 cases, it could be beneficial to include resources that could decrease caregiver stress and allow for continued access to quality childcare. Policies at the federal, state, and individual workplace levels should also recognize the disparate impact of childcare duties or other caregiving responsibilities on women (Burki, 2020). Policies should also seek to balance prioritization of physical health with men-

tal health and to reduce forms of stress that negatively impact family well-being.

From a practice standpoint, the percentage of respondents who reported mental health issues, including feeling worried/anxious, during COVID-19, suggests an increase in preventative mental health services for families is warranted. One suggestion is for mental health agencies to be provided training and support to provide virtual mental health support for parents, including counseling, support groups, and perhaps even case management support for families experiencing the most difficulty. This could be particularly useful for caregivers of infants and young children, given that often they are not enrolled in schools that may be conducting more outreach or periodic check-ins. Thus, local community agencies and organizations could conduct outreach to target caregivers of children zero-to-five and provide support as needed.

While the findings of this study guide our knowledge about maternal mental health during the COVID-19 pandemic, it also identifies gaps for future research. One area research should continue to focus on is understanding family mental health and well-being during this unprecedented time. Emphasis should be placed on identifying factors that detract from, and contribute to, family mental health and well-being, so that effective prevention and intervention strategies can be implemented. Additionally, research should expand these findings to track changes in anxiety over time, including factors that contribute to these changes, such as specific services, increased access to childcare, or the like. Other research could target those not adhering to social distancing guidelines, specifically to understand whether their report of lower anxiety translates to a lower experience of stress. Finally, longitudinal research should investigate the link between caregiver's mental health and future child outcomes.

## Conclusion

In conclusion, the findings of this study suggest that adherence to measures of social distancing and being bothered by withdrawal from activities of interest are associated with feeling anxious among female caregivers of children ages zero-to-five. As the pandemic continues to evolve, it is important to build community response to better support caregivers of infants and young children. Adapting to caregiving can produce feelings of isolation and anxiety even during normal times; and during a pandemic, it is crucial to provide support and check-ins to ensure that mothers feel supported and connected.

## Declaration of Competing Interest

The authors declare that they have no conflicts of interests with respect to the authorship and/or the publication of this paper.

## Acknowledgements

Philip Baiden would like to gratefully acknowledge support received from the Jillian Michelle Smith Professorship in Family Violence Research at the University of Texas at Arlington, School of Social Work.

## References

- Ahorstu, D.K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M.D., Pakpour, A.H., 2020. The fear of COVID-19 scale: development and initial validation. *Int. J. Ment. Health Ad.* doi:10.1007/s11469-020-00270-8.
- Amare, T., Getinet, W., Shumet, S., Asrat, B., 2018. Prevalence and associated factors of depression among PLHIV in Ethiopia: systematic review and meta-analysis, 2017. *AIDS Res. Treatm.* 2018. doi:10.1155/2018/5462959.
- Baiden, P., den Dunnen, W., Fallon, B., 2017. Examining the independent effect of social support on unmet mental healthcare needs among Canadians: Findings from a population-based study. *Social Indicators Research* 130 (3), 1229–1246. doi:10.1007/s11205-015-1224-y.
- Berkman, L.F., Kawachi, I., Glymour, M.M., 2014. *Social epidemiology*. Oxford University Press.
- Berry, J.O., Jones, W.H., 1995. The parental stress scale: initial psychometric evidence. *J. Soc. Pers. Relat.* 12 (3), 463–472.

- Berthelot, N., Lemieux, R., Garon-Bissonnette, J., Drouin-Maziade, C., Martel, É., Maziade, M., 2020. Uptrend in distress and psychiatric symptomatology in pregnant women during the COVID-19 pandemic. *Acta Obstet. Gynecol. Scand.* 99, 848–855. doi:10.1111/aogs.13925.
- Betancourt, T.S., Meyers-Ohki, S.E., Charrow, A., Hansen, N., 2013. Annual research review: mental health and resilience in HIV/AIDS-affected children—a review of the literature and recommendations for future research. *J. Child Psychol. Psych.* 54 (4), 423–444. doi:10.1111/j.1469-7610.2012.02613.x.
- Bigby, C., 2012. Social inclusion and people with intellectual disability and challenging behavior: a systematic review. *J. Intellect. Dev. Dis.* 37 (4), 360–374. doi:10.3109/13668250.2012.721878.
- Bigras, N., Lemay, L., Brunson, L., 2012. Parental stress and daycare attendance: does daycare quality and parental satisfaction with daycare moderate the relation between family income and stress level among parents of four years old children? *Proc. Soc. Behv.* 55, 894–901. doi:10.1016/j.sbspro.2012.09.578.
- Brooks, S.K., Webster, R.K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., Rubin, G.J., 2020. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 395 (10227), 14–20. doi:10.1016/S0140-6736(20)30460-8.
- Burki, T., 2020. The indirect impact of COVID-19 on women. *Lancet Infect. Dis.* 20 (8), 904–905.
- Casale, M., Wild, L., 2013. Effects and processes linking social support to caregiver health among HIV/AIDS-affected carer-child dyads: a critical review of the empirical evidence. *AIDS Behav.* 17 (5), 1591–1611. doi:10.1007/s10461-012-0275-1.
- Catalan, J., Harding, R., Sibley, E., Clucas, C., Croome, N., Sherr, L., 2011. HIV infection and mental health: suicidal behaviour—systematic review. *Psychol. Health Med.* 16 (5), 588–611. doi:10.1080/13548506.2011.582125.
- Cénat, J.M., Mukunzi, J.N., Noorishad, P.-G., Rousseau, C., Derivois, D., Bukaka, J., 2020. A systematic review of mental health programs among populations affected by the Ebola virus disease. *J. Psychosom. Res.* 131, 109966. doi:10.1016/j.jpsychores.2020.109966.
- Centers for Disease Control and Prevention. (2020). *Coronavirus disease 2019 (COVID-19)*. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>.
- Cohen, S., Wills, T.A., 1985. Stress, social support, and the buffering hypothesis. *Psychol. Bull.* 98 (2), 310–357. doi:10.1037/0033-2909.98.2.310.
- Czeisler, M.E., Tynan, M.A., Howard, M.E., Honeycutt, S., Fulmer, E.B., Kidder, D.P., Robbins, R., Barger, L.K., Facer-Childs, E.R., Baldwin, G., 2020. Public attitudes, behaviors, and beliefs related to COVID-19, stay-at-home orders, nonessential business closures, and public health guidance—United States, New York City, and Los Angeles, May 5–12, 2020. *MMWR-Morbidity Mortal. Wkly.* 69 (24), 751–758. doi:10.15585/mmwr.mm6924e1.
- de Souza, L.E.C., de Lima, T.J.S., Ribeiro, E.M., Pessoa, A.L.S., Figueiredo, T.C., Lima, L.B.P., 2018. Mental health of parents of children with congenital Zika virus syndrome in Brazil. *J. Child Fam. Stud.* 27 (4), 1207–1215. doi:10.1007/s10826-017-0969-0.
- Deater-Deckard, K., 2008. *Parenting Stress*. Yale University Press.
- Dolan, N., Sherlock, C., 2010. Family support through childcare services: meeting the needs of asylum-seeking and refugee families. *Child Care Pract.* 16 (2), 147–165. doi:10.1080/13575270903493382.
- Ebuenyi, I., Taylor, C., O'Flynn, D., Matthew Prina, A., Passchier, R., Mayston, R., 2018. The impact of co-morbid severe mental illness and HIV upon mental and physical health and social outcomes: a systematic review. *AIDS Care* 30 (12), 1586–1594. doi:10.1080/09540121.2018.1510110.
- Ford, L., 2011. Assisting infants to achieve self-regulated sleep: the KIDSCODE® baby process. *Aust. J. Early Child.* 36 (3), 82–90. doi:10.1177/183693911103600311.
- Griffin, C., Guerin, S., Sharry, J., Drumm, M., 2010. A multicentre controlled study of an early intervention parenting programme for young children with behavioural and developmental difficulties. *Int. J. Clin. Hlth. Psych.* 10 (2), 279–294.
- Griffith, A.K., 2020. Parental burnout and child maltreatment during the COVID-19 pandemic. *J. Fam. Violence* 1–7. doi:10.1007/s10896-020-00172-2.
- Harper, C.A., Satchell, L.P., Fido, D., Litzman, R.D., 2020. Functional fear predicts public health compliance in the COVID-19 pandemic. *Int. J. Ment. Health Ad.* 1–14. doi:10.1007/s11469-020-00281-5.
- Hartog, K., Hubbard, C.D., Krouwer, A.F., Thornicroft, G., Kohrt, B.A., Jordans, M.J., 2020. Stigma reduction interventions for children and adolescents in low-and middle-income countries: systematic review of intervention strategies. *Soc. Sci. Med.* 246, 112749. doi:10.1016/j.socscimed.2019.112749.
- Hawthorne, G., 2008. Perceived social isolation in a community sample: its prevalence and correlates with aspects of peoples' lives. *Soc. Psych. Psych. Epid.* 43 (2), 140–150. doi:10.1007/s00127-007-0279-8.
- Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Silver, R.C., Everall, I., 2020. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiat.* 7, 547–560. doi:10.1016/S2215-0366(20)30168-1.
- Holt-Lunstad, J., Smith, T.B., Layton, J.B., 2010. Social relationships and mortality risk: a meta-analytic review. *PLoS Med.* 7 (7), e1000316. doi:10.1371/journal.pmed.1000316.
- Ikedo, A., Kawachi, I., 2010. Social networks and health. In: *Handbook of Behavioral Medicine*. Springer, pp. 237–261.
- James, P.B., Wardle, J., Steel, A., Adams, J., 2019. Post-Ebola psychosocial experiences and coping mechanisms among Ebola survivors: a systematic review. *Trop. Med. Int. Health* 24 (6), 671–691. doi:10.1111/tmi.13226.
- Janisse, H.C., Barnett, D., Nies, M.A., 2009. Perceived energy for parenting: a new conceptualization and scale. *J. Child Fam. Stud.* 18 (3), 312–322. doi:10.1007/s10826-008-9232-z.

- Jeong, H., Yim, H.W., Song, Y.-J., Ki, M., Min, J.-A., Cho, J., Chae, J.-H., 2016. Mental health status of people isolated due to Middle east respiratory syndrome. *Epidemiol. Health* 38, 1–7. doi:10.4178/epih.e2016048.
- Kawachi, I., Berkman, L.F., 2014. Social capital, social cohesion, and health. *Soc. Epidemiol.* 2, 290–319.
- LaBrenz, C.A., Dell, P.J., Fong, R., Liu, V., 2019. Happily ever after? Life satisfaction after childhood exposure to violence. *J. Interpers. Violence* doi:10.1177/0886260518820706.
- Lindström, C., Aaman, J., Norberg, A.L., 2011. Parental burnout in relation to sociodemographic, psychosocial and personality factors as well as disease duration and glycaemic control in children with Type 1 diabetes mellitus. *Acta Paediatr.* 100 (7), 1011–1017 <https://doi.org/10.1111/j.1651-2227.2011.02198.x>.
- Louie, A.D., Cromer, L.D., Berry, J.O., 2017. Assessing parenting stress: review of the use and interpretation of the parental stress scale. *Family J.* 25 (4), 359–367. doi:10.1177/1066480717731347.
- Manuell, M.-E., Cukor, J., 2011. Mother Nature versus human nature: public compliance with evacuation and quarantine. *Disasters* 35 (2), 417–442. doi:10.1111/j.1467-7717.2010.01219.x.
- Mikolajczak, M., Brianda, M.E., Avalosse, H., Roskam, I., 2018. Consequences of parental burnout: its specific effect on child neglect and violence. *Child Abuse Neglect* 80, 134–145. doi:10.1016/j.chiabu.2018.03.025.
- Mikolajczak, M., Raes, M.-E., Avalosse, H., Roskam, I., 2018. Exhausted parents: sociodemographic, child-related, parent-related, parenting and family-functioning correlates of parental burnout. *J. Child Fam. Stud.* 27 (2), 602–614. doi:10.1007/s10826-017-0892-4.
- Mitchell, J., Wight, M., Van Heerden, A., Rochat, T.J., 2016. Intimate partner violence, HIV, and mental health: a triple epidemic of global proportions. *Int. Rev. Psychiatr.* 28 (5), 452–463. doi:10.1080/09540261.2016.1217829.
- Norberg, A.L., 2010. Parents of children surviving a brain tumor: burnout and the perceived disease-related influence on everyday life. *J. Pediatr. Hematol. Onc.* 32 (7), e285–e289. doi:10.1097/MPH.0b013e3181e7dda6.
- Page, L.A., Seetharaman, S., Suhail, I., Wessely, S., Pereira, J., Rubin, G.J., 2011. Using electronic patient records to assess the impact of swine flu (influenza H1N1) on mental health patients. *J. Ment. Health* 20 (1), 60–69. doi:10.3109/09638237.2010.542787.
- Patrick, S.W., Henkhaus, L.E., Zickafoose, J.S., Lovell, K., Halvorson, A., Loch, S., Letterie, M., Davis, M.M., 2020. Well-being of parents and children during the COVID-19 pandemic: a national survey. *Pediatrics* doi:10.1542/peds.2020-016824.
- Perissinotto, C.M., Cenzer, I.S., Covinsky, K.E., 2012. Loneliness in older persons: a predictor of functional decline and death. *Arch. Intern. Med.* 172 (14), 1078–1084. doi:10.1001/archinternmed.2012.1993.
- Pfefferbaum, B., North, C.S., 2020. Mental health and the Covid-19 pandemic. *New Engl. J. Med.* 383, 510–512. doi:10.1056/NEJMp2008017.
- Piehl, C., Budimir, S., Probst, T., 2020. The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. *J. Psychosom. Res.* 136, 110186. doi:10.1016/j.jpsychores.2020.110186.
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., Xu, Y., 2020. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *Gen. Psychiatry* 33 (2), e100213. doi:10.1136/gpsych-2020-100213.
- Rauch, S.A., Simon, N.M., Rothbaum, B.O., 2020. Rising tide: responding to the mental health impact of the COVID-19 pandemic. *Depress. Anxiety* 37, 505–509. doi:10.1002/da.23058.
- Roskam, I., Raes, M.-E., Mikolajczak, M., 2017. Exhausted parents: development and preliminary validation of the parental burnout inventory. *Front. Psychol.* 8, 163. doi:10.3389/fpsyg.2017.00163.
- Sánchez-Rodríguez, R., Orsini, É., Laflaquière, E., Callahan, S., Séjourné, N., 2019. Depression, anxiety, and guilt in mothers with burnout of preschool and school-aged children: Insight from a cluster analysis. *J. Affect. Disord.* 259, 244–250. doi:10.1016/j.jad.2019.08.031.
- Satici, B., Gocet-Tekin, E., Deniz, M.E., Satici, S.A., 2020. Adaptation of the fear of COVID-19 scale: its association with psychological distress and life satisfaction in Turkey. *Int. J. Ment. Health Ad.* 1-9. doi:10.1007/s11469-020-00294-0.
- Small, M.L., 2006. Neighborhood institutions as resource brokers: childcare centers, interorganizational ties, and resource access among the poor. *Soc. Probl.* 53 (2), 274–292. doi:10.1525/sp.2006.53.2.274.
- Smith, K.J., Victor, C., 2019. Typologies of loneliness, living alone and social isolation, and their associations with physical and mental health. *Ageing Soc.* 39 (8), 1709–1730. doi:10.1017/S0144686X18000132.
- Smith, K.P., Christakis, N.A., 2008. Social networks and health. *Annu. Rev. Sociol.* 34, 405–429.
- Tierney, A.L., Nelson III, C.A., 2009. Brain development and the role of experience in the early years. *Zero Three* 30 (2), 9–13.
- Valtorta, N.K., Kanaan, M., Gilbody, S., Ronzi, S., Hanratty, B., 2016. Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. *Heart* 102 (13), 1009–1016. doi:10.1136/heartjnl-2015-308790.
- Venkatesh, A., Edirappuli, S., 2020. Social distancing in covid-19: what are the mental health implications? *BMJ* 369. doi:10.1136/bmj.m1379.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R.S., Choo, F.N., Tran, B., Ho, R., Sharma, V.K., 2020. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain Behav. Immun.* 87, 40–48. doi:10.1016/j.bbi.2020.04.028.
- Wang, H., Xia, Q., Xiong, Z., Li, Z., Xiang, W., Yuan, Y., Liu, Y., Li, Z., 2020. The psychological distress and coping styles in the early stages of the 2019 coronavirus disease (COVID-19) epidemic in the general mainland Chinese population: a web-based survey. *Plos One* 15 (5), e0233410. doi:10.1371/journal.pone.0233410.
- Wang, J., Lloyd-Evans, B., Marston, L., Ma, R., Mann, F., Solmi, F., Johnson, S., 2019. Epidemiology of loneliness in a cohort of UK mental health community crisis service users. *Soc. Psych. Psych. Epid.* 55, 811–822. doi:10.1007/s00127-019-01734-6.
- Waterman, S., Hunter, E.C.M., Cole, C.L., Evans, L.J., Greenberg, N., Rubin, G.J., Beck, A., 2018. Training peers to treat Ebola centre workers with anxiety and depression in Sierra Leone. *Int. J. Soc. Psychiatr.* 64 (2), 156–165. doi:10.1177/0020764017752021.
- Watson, J., Nesdale, D., 2012. Rejection sensitivity, social withdrawal, and loneliness in young adults. *J. Appl. Soc. Psychol.* 42 (8), 1984–2005. doi:10.1111/j.1559-1816.2012.00927.x.
- Yi-Ching, L., Shu, B.-C., Yong-Yuan, C., 2006. The mental health of hospital workers dealing with severe acute respiratory syndrome. *Psychother. Psychosom.* 75 (6), 370–375. doi:10.1159/000095443.
- Ypsilanti, A., Robson, A., Lazarus, L., Powell, P.A., Overton, P.G., 2020. Self-disgust, loneliness and mental health outcomes in older adults: an eye-tracking study. *J. Affect. Disord.* 266, 646–654. doi:10.1016/j.jad.2020.01.166.
- Zelman, J.J., Ferro, M.A., 2018. The parental stress scale: psychometric properties in families of children with chronic health conditions. *Fam. Relat.* 67 (2), 240–252. doi:10.1111/fare.12306.