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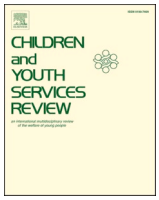

# Associations of food insecurity and material social support with parent and child mental health during COVID-19

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ABSTRACT

The rise of mental health problems during COVID-19 has been called a national crisis. Parents and caregivers reported parenting stress, anxiety, and depression, which may be exacerbated by economic insecurity. This study used longitudinal data to examine the association of food insecurity and material social support to subsequent parent and child mental health outcomes in the early weeks of COVID-19. Data were collected from a national convenience sample of U.S. parents (N = 359) at two time points: April 14, 2020 (T1) and April 30, 2020 (T2). Data were analyzed using multivariate linear and logistic regression analyses. Most of the sample were mothers (67.5%) and identified as White (69.6%). Among parents for whom services were applicable, over half (51.4%) were unable to receive free and reduced-cost school-based lunch. Food insecurity at T1 was significantly associated with higher odds of parental anxiety (OR = 1.52, $p$ <.001) and depression (OR = 1.63, $p$ <.001), as well as increased parenting stress (β = 0.16, $p$ =.008) and parental report of child anxiety (β = 0.15, $p$ =.014). Conversely, material social support was significantly associated with lower odds of parental anxiety (OR = 0.90, $p$ =.014) and depression (OR = 0.85, $p$ <.001), as well as lower levels of parenting stress (β = -0.20, $p$ =.001) and parental report of child anxiety (β = -0.13, $p$ =.028). Results suggest that household food insecurity may place parents and children at greater risk for mental health problems during COVID-19. However, access to tangible resources that offer material or financial support may be protective for both parent and child mental health. Study results suggest that policy interventions are needed to support the economic wellbeing of families during COVID-19.

## 1. Introduction

Numerous studies document the rise of stress mental health problems during COVID-19. Data from the nationally representative U.S. Census Household Pulse Survey indicated that during spring and summer 2020, levels of anxiety and depression among U.S. adults were triple their pre-pandemic levels. During this time, 11.6 million more U.S. adults reported symptoms that would meet the screening criteria for generalized anxiety disorder and major depressive disorder (Cai et al., 2021; Lee et al., 2022; Twenge & Joiner, 2020; Terlizzi & Villarroel, 2020); and levels of anxiety and depression increased over this time period (Cai et al., 2021; Lee et al., 2022). Although there is limited data on children, there is reason to believe that children's mental health may have suffered as well (Lee et al., 2021; Patrick et al., 2020). Based on parental self-report, children experienced heightened anxiety and troubles coping with social isolation and at-home education (Lee et al., 2021). Researchers posited that the vast job loss, economic insecurity, and school closures contributed to declining child wellbeing (Gassman-Pines & Gennetian, 2020).

Another potential strain on caregivers and children during COVID-19 was high rates of food insecurity (Bauer, 2020; Waxman et al., 2020). The closure of schools in March 2020 exacerbated food insecurity, reportedly cutting off millions of families from school-based free and reduced-price meals during school closures (Waxman et al., 2020). Food insecurity has been linked to poorer mental health of parents and children (Myers, 2020). The current study used survey data collected from a national convenience sample of U.S. parents in early and late April 2020 to examine longitudinal associations of food insecurity and material

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social support, as self-reported by a parent or caregiver, with subsequent changes in parenting stress, anxiety, and depression. Furthermore, this study asked whether household food insecurity and material social support contributes to parental report of child anxiety, noting that very few studies to date have examined the mental health of children during the early months of COVID-19. The survey time frame coincides with the early months of the COVID-19 pandemic, before policy measures such as the Families First Coronavirus Response Act were fully implemented to remedy the economic consequences of COVID-19 (Waxman et al., 2020).

### 1.1. Food insecurity during COVID-19

The National School Lunch Program helps to alleviate food insecurity for millions of vulnerable families. Prior to COVID-19, nearly 35 million children received free or reduced price lunches daily through the National School Lunch Program (Dunn et al., 2020). However, during COVID-19, school closures meant that millions of children faced barriers to receiving free or reduced price lunches at school, presenting a major concern regarding increasing food insecurity among families with low-income (Dunn et al., 2020; Waxman et al., 2020). Indeed, during June 2020, data from the U.S. Census suggested that as many as 16.5% of respondents living in households with children said it was "sometimes" or "often" the case that the children in the household were not eating enough due to lack of resources (Bauer, 2020). Prior research has linked household food insecurity to child outcomes. For example, food insecurity is associated with acute and chronic physical health outcomes among children (Thomas et al., 2019). Additionally, food insecurity is also predictive of greater child behavior problems, hyperactivity, and inattention (Melchior et al., 2009; Melchior et al., 2012).

In addition, during the first few months of the COVID-19 pandemic, one in five children in the U.S. experienced the job loss of an adult in their household (Bokun et al., 2020; Gassman-Pines & Gennetian, 2020). Food insecurity was not limited to school-aged children. One study suggested that 27% of pregnant women reported inability to obtain healthy food; 7% reported financial hardships as the reason they were unable to obtain healthy foods (Barbosa-Leiker et al., 2021). Another study of parents of children under the age of 5 found that 25% of mothers perceived more difficulty providing food for their children (Rodriguez et al., 2021). While policymakers helped to reduce food insecurity by releasing stimulus checks to millions of Americans through The Families First Coronavirus Response Act (Waxman et al., 2020), many have pointed to significant gaps regarding how well those resources reached needy families in a timely fashion (Gassman-Pines & Gennetian, 2020; Roll & Grinstein-Weiss, 2020).

### 1.2. Perceived social support in the context of COVID-19

Social support theory encompasses a range of resources that individuals draw upon during times of adversity, including tangible (material) support, emotional support, and information support (Cohen & Hoberman, 1983). Social support can be provided formally through institutions (e.g., schools, churches, and neighborhood organizations) as well as provided informally by individuals (e.g., neighbors, family members, and friends) (Harpham, 2008, pg. 51). Social support is thought to buffer individuals from the stress experienced during adverse events (Cohen & Gottlieb, 2000). Having access to forms of social support through one's social network may lessen the strains associated with stressful life events.

Approaches to social support theory have disaggregated structural and cognitive forms of social support. Cognitive social support is thought to be more subjective, and refers to the ways in which people feel, or their values and perceptions (Harpham, 2008, pg. 51). Structural forms of social support include access to tangible resources, such as those provided from one's social network as well as those available from social services, that one can access to provide social support. One widely used measure of social support is the Interpersonal Support Evaluation List (ISEL; Cohen et al., 1985), which assesses four domains of social support that are thought to buffer individuals in unique ways from stressful life events. Specifically, in this study, we focused on the forms of tangible support assessed by the ISEL. The tangible support subscale is intended to measure whether the individual perceives they have access to tangible resources during an emergency (Cohen & Hoberman, 1983; Cohen et al., 1985).

The forms of tangible support measured included items examining need for an emergency loan from a friend, emergency child care, a place to stay during an emergency, a ride to work, help with daily chores like going to the grocery store, and help getting to a doctor's appointment. Examining these forms of tangible support during COVID-19 is compelling for a number of reasons. In the first few months of COVID-19, stay-at-home and shelter-in-place orders meant that most institutions such as schools, child care centers, and nonprofit organizations were closed to in-person contact (The White House, Office of the Press Secretary, 2020; Friedson et al., 2020). For example, one survey of parents early in the pandemic found that nearly 1 in 4 parents reported that they had lost regular child care (Patrick et al., 2020). Lack of access to basic services such as child care, transportation, grocery stores, and doctor's offices were disrupted during the early months of the COVID-19 pandemic likely heightened the relevance of these forms of support for many parents. Thus the forms of tangible measured in the current study may have been particularly salient to many people during the initial COVID-19 shutdown period.

Indeed, research conducted prior to the COVID-19 pandemic underscores the importance of material social support to families, particularly families with low income. For example, one study that measured material social support found that lack of access to material social supports such as emergency child care were associated with women missing work more frequently (Usdansky & Wolf, 2008) and, in another study, lower levels of material social support were associated with lower employment outcomes among unmarried women (Radey, 2008). Furthermore, these pre-pandemic studies have linked the availability of various forms of social support, including access to material social support, to lower odds of major depression (Meadows, 2009) as well as lower risk of food insecurity (King, 2017). Additionally, material social support among mothers has been linked to increased personal control, and decreased neglectful parenting, which may be related to child socio-emotional development (Kang, 2013). Similarly, financial support from nonresidential fathers has been directly linked to child cognitive development (Choi & Pyun, 2013). On the whole, these studies provide support for the notion that access to tangible resources has meaningful implications for wellbeing for parents, perhaps even more so among vulnerable families with children, who generally have fewer resources to cope with emergencies.

### 1.3. The current study

To our knowledge, few studies have examined direct linkages of food insecurity and material social support to child mental health, either pre-pandemic or during the COVID-19 pandemic. Furthermore, we conduct analyses examining parents' perceived material social support from others as a potential buffer. The current study examined the short-term longitudinal associations of food insecurity and parents' perceived material social support, measured in early April, with subsequent assessment of parent and child mental health measured two weeks later. Based on prior research, we hypothesized that higher levels of food insecurity would be associated with poorer parental mental health outcomes (i.e., anxiety, depression, parenting stress). We also hypothesized that higher levels of food insecurity would be associated with lower levels of child wellbeing (i.e., higher levels of parental report of child anxiety). Similarly, based on prior studies of the potential benefits of material social support in buffering the effects of economic strain more broadly, we hypothesized that higher levels of material or tangible social support would be associated with better parental mental health outcomes (i.e.,

anxiety, depression, parenting stress) and lower levels of parent-reported child anxiety.

## 2. Methods

### 2.1. Participants and procedures

Data were collected via Prolific, an online survey research company. The survey was launched at two time points: April 14, 2020 (T1), which was nearly five weeks after WHO declared COVDI-19 a pandemic, and April 30, 2020 (T2). Prolific recruited participants from across the United States, although the sample was not nationally representative. Eligibility criteria included being at least 18 years of age and currently residing in the U.S. Participants were notified of their eligibility via the Prolific platform, and taken to a Qualtrics survey, which was programmed and managed by the research team. After completing the survey, participants received a payment of $6 USD via the Prolific platform. All survey data were completely anonymous to the research team. On average, it took participants 40 min to complete the survey ($SD = 20$ min). Three attention checks were embedded in the survey to ensure data quality, and none of the participants failed more than one attention check. The University of Michigan Institutional Review Board considered these procedures exempt from oversight.

A total sample of 654 respondents participated at T1, and 619 participated at T2. We restricted our analyses to participants who were parents of at least one child age 12 years or younger, leaving a final sample size of 359. Most of the sample were mothers (67.5%) and identified as White (69.6%). Many had at least a bachelor's degree (44.6%). Nearly one-fourth of parents indicated they had experienced an employment change due to COVID-19 (23.4%). The average age was 34 years, and the average income was between $40 k-$50 k. At T1, participants had been social distancing for an average of 26 days, and in lockdown for an average of 20 days. Among parents for whom services were applicable, over half (51.4%) were unable to receive free and reduced-cost school-based lunch due to COVID-19 restrictions, and some (15.1%) were unable to provide lunch for their child because of the lack of this service. A large majority (85.9%) were unable to access their usual childcare or daycare, showing that this sample likely experienced decreased access to food and a reduction in social resources due to COVID-19.

### 2.2. Measures

**Food Insecurity.** Food insecurity was measured using four items from the U.S. Household and Security Survey (U.S. Department of Agriculture, 2020). Items included "I worried whether food would run out before I got money to buy more," "The food that I bought just didn't last, and I didn't have money to get more," "I couldn't afford to eat balanced meals," and "I relied on only a few kinds of low-cost food because I was running out of money to buy food" (0 = *never true*, 1 = *sometimes or often true*). Items were summed to reflect severity of food insecurity (range: 0–4). The internal reliability of the scale in our sample was good ($\alpha = 0.90$).

**Material Social Support.** We used the 10-item tangible support subscale of the Interpersonal Support Evaluation List (ISEL) to measure material social support (Cohen et al., 1985). This measure has been adapted and used widely in large-scale surveys such as the Fragile Families and Child Wellbeing study (e.g., Harknett & Knab, 2007; King, 2017; Meadows, 2009; Usdansky & Wolf, 2008). We used the items from the adapted version of the ISEL that was used in the Fragile Families and Child Wellbeing study. Participants were asked to indicate whether they could get help if they needed it (0 = *no*, 1 = *yes*) in 10 different scenarios: "If you need help during the next few months, could you count on someone to loan you $200?", "If you need help during the next few months, could you count on someone to loan you $1000?", "Is there someone you could count on to co-sign for a bank loan with you for $1,000?", " Is there someone you could count on to co-sign for a bank loan with you for $5,000?", "If you needed a place to stay for a week because of an emergency, is there someone you could count on to provide you with a place to live?", "Is there someone you could count on to give you a ride to work?", "Is there someone you could count on to help you with emergency child care?", "Is there someone you could count on to loan you their car?", "If you were sick, is there someone who could help you with daily chores like going to the grocery store or pharmacy?", and "Is there someone you could count on to take you to a doctor's appointment?". Items were summed to reflect the amount of tangible support available to participants (range: 0–10). The internal reliability of the scale in our sample was good ($\alpha = 0.89$).

**Parental Depression.** Depression was measured with the 8-item Personal Health Questionnaire (PHQ-8; Kroenke et al., 2009; Kroenke et al., 2001). The PHQ-8 is a valid diagnostic tool to estimate rates of depressive disorders in the general population. Participants were asked, "Over the last 2 weeks, how often have you been bothered by any of the following problems?" Sample items include, "Little interest or pleasure in doing things," "Feeling down, depressed, or hopeless," and "Feeling tired or having little energy." Items were assessed on a 4-point response scale from 0 = *not at all*, 1 = *several days*, 2 = *more than half the days*, and 3 = *nearly every day*, resulting in a score range from 0 to 24. A score of 9 or under indicates the participant is not depressed; a score between 10 and 19 indicates the participant has probable major depression; and a score between 20 and 24 indicates the participant has probable severe major depression. We created a dichotomous variable to reflect whether the participant met the PHQ-8 criteria for major depression or severe major depression, in which scores of 9 or less were coded "0" and scores of 10 or above were coded "1" (0 = *not depressed*, 1 = *probable major depression or severe major depression*).

**Parental Anxiety.** Anxiety was measured using the Generalized Anxiety Disorder, 7-item scale (GAD-7; Spitzer et al., 2006). The GAD-7 is a widely used and well validated diagnostic tool to estimate rates of anxiety in the general population. Participants were asked, "Over the last 2 weeks, how often have you been bothered by the following problems?" Sample items include, "Feeling nervous, anxious, or on-edge," "not being able to stop or control worrying," and "trouble relaxing. Items were assessed on a 4-point response scale from 0 = *not at all*, 1 = *several days*, 2 = *more than half the days*, and 3 = *nearly every day*, resulting in a score range from 0 to 21. A score of 4 or under indicates the participant has minimal anxiety; a score between 5 and 9 indicates the participant has probable mild anxiety; a score between 10 and 14 indicates the participant has probable moderate anxiety; and a score between 15 and 21 indicates the participant has probable severe anxiety. We created a dichotomous variable to reflect whether the participant met the GAD-7 criteria for moderate or severe anxiety, in which scores of 9 or less were coded "0" and scores of 10 or above were coded "1" (0 = *minimal or mild anxiety*, 1 = *moderate or severe anxiety*).

**Parenting Stress.** Parenting stress was measured by the four-item Aggravation in Parenting Scale that was utilized in the Fragile Families and Child Wellbeing Study. This measure has been widely used as a benchmark measure of child and family wellbeing (Ehrle & Moore, 1997) including in the Child Development Supplement of the Panel Study of Income Dynamics (Hofferth et al., 1997). Parents were asked whether they: 1) felt that their child(ren) are harder to care for than most children, 2) felt that there are things that their child(ren) do that bother them a lot, 3) find themselves giving up more of their lives to meet their children's needs than they ever expected, and 4) felt angry with their child(ren) on a scale from 1 (*never true*) to 4 (*always true*). The internal consistency of the scale in our sample was good ($\alpha = 0.83$). Although we did not use this measure as a latent construct in analyses, we ran a confirmatory factor analysis on these items, and the model fit showed good construct validity (CFI: 1.00, TLI: 1.01, RMSEA: 0.00, SRMR: 0.01).

**Child Anxiety.** Child anxiety was measured using the child anxiety subscale of the Child Behavior Checklist/4–18 (Achenbach & Rescorla,

1992). Participants were asked, "Since approximately 2 weeks ago, my child(ren):" and were presented with 14 items that were rated on a three-point scale (0 = *not true*, 1 = *true*, 2 = *often true*). Sample items include, "(he/she) worries," "is too fearful or anxious," and "is nervous, high strung, or tense." Items were averaged to create a scale, which demonstrated good internal consistency (α = 0.87). Although we did not use this measure as a latent construct in analyses, we ran a confirmatory factor analysis on these items. The model fit showed fairly good construct validity after incorporating five residual covariances (CFI: 0.91, TLI: 0.89, RMSEA: 0.09, SRMR: 0.07).

**Control Variables.** Parents' age was continuous and measured in years. Number of days spent in lockdown and the number of days spent social distancing were also continuous. Employment change due to COVID-19 was measured by asking participants, "Has your employment status changed (e.g., laid off, furloughed, etc.) in the last 2 weeks due to the Coronavirus/ COVID-19 global health crisis?" (0 = *no*, 1 = *yes*). Income was measured with seven categories (1=*$10 k-$20 k*, 2=*$20 k-30 k*, 3=*$30 k-$40*, 4=*$40 k-$50 k*, 5=*$50 k-70 k*, 6=*$70 k-$90 k*, 7=*$90 k or more*), and was modeled as a continuous variable. Whether the participant was cohabitating with a romantic partner was dichotomous (0 = *no*, 1 = *yes*). Race and education level were modeled as a series of dummy variables (Race: *White* [comparison], *Black, Hispanic, Other*; Education: *High school or less* [comparison], *Some College, Bachelor's degree or higher*).

### 2.3. Analysis plan

Data were cleaned in Stata version 15.1 and analyzed in Mplus version 8. Data were scanned for outliers and multicollinearity, neither of which were found. Missing data on our dependent variables were extremely few (<3%), as were missing data on our independent variables (<3.5%). Therefore, missing data were handled with full-information maximum likelihood estimation (FIML), which uses all available data. For analyses with continuous dependent variables (i.e., parenting stress and child anxiety), multivariate linear regression analyses were conducted using Maximum Likelihood estimation. For analyses with dichotomous dependent variables (i.e., parental anxiety and depression), multivariate logistic regression analyses were conducted using 1,000 iterations of Monte Carlo integration, which produced odds ratio (OR) coefficients. An OR of 1 suggests there is no association between the independent and dependent variable, while an OR above 1 suggests there is a positive association between those variables. Descriptive statistics of study variables can be found in Table 1.

**Table 1**
Descriptive Statistics of Study Variables (N = 359).

| | M | SD | Min | Max | N | % |
|---|---|---|---|---|---|---|
| Food insecurity, T1 | 1.52 | 1.63 | 0 | 4 | | |
| Material social support, T1 | 6.10 | 3.26 | 0 | 10 | | |
| No school lunch, T1 | | | | | 73 | 51.41 |
| No child lunch, T1 | | | | | 11 | 15.07 |
| No childcare/daycare, T1 | | | | | 110 | 85.94 |
| Parent depression, T2 | | | | | 129 | 36.03 |
| Parent anxiety, T2 | | | | | 113 | 32.10 |
| Parenting stress, T2 | 0.73 | 0.69 | 0 | 3 | | |
| Child anxiety, T2 | 0.22 | 0.27 | 0 | 1.36 | | |
| Parent age, T1 | 34.44 | 7.11 | 19 | 56 | | |
| SD days, T1 | 26.13 | 10.53 | 0 | 60 | | |
| Lockdown days, T1 | 19.74 | 10.71 | 0 | 60 | | |
| Income, T1 | 3.88 | 2.09 | 1 | 7 | | |
| Parent race, T1 | | | | | | |
| White | | | | | 249 | 69.55 |
| Black | | | | | 43 | 12.01 |
| Hispanic | | | | | 37 | 10.34 |
| Other | | | | | 29 | 8.10 |
| Parent education, T1 | | | | | | |
| High school | | | | | 48 | 13.37 |
| Some college | | | | | 151 | 42.06 |
| Bachelors + | | | | | 160 | 44.57 |
| Cohabitating, T1 | | | | | 284 | 79.33 |
| Parent sex, female, T1 | | | | | 241 | 67.51 |
| Parent Employment Change, T1 | | | | | 84 | 23.40 |

*Note*: T1 = Time 1 (April 14, 2020); T2 = Time 2 (April 30, 2020). SD = social distancing. Income categories: 1=*$10 k-$20 k*, 2=*$20 k-30 k*, 3=*$30 k-$40*, 4=*$40 k-$50 k*, 5=*$50 k-70 k*, 6=*$70 k-$90 k*, 7=*$90 k or more*. "No school lunch" = parents were not able to receive free or reduced cost lunch (among parents who normally use free/reduced cost lunch, n = 142). "No child lunch" = children did not eat lunch because there was no free/reduced cost school lunch available (among parents who were unable to access free/reduced cost lunch, n = 73). "No childcare/daycare" = could not access childcare/daycare among parents who typically use those services (n = 128).

## 3. Results

### 3.1. Food insecurity

Table 2 displays the results from regression models with food insecurity as the main predictor. Results from multivariate logistic regression analyses showed that a one-unit increase in food insecurity at T1 was associated with 52% higher odds of parents meeting GAD-7 criteria for anxiety at T2 (OR = 1.52, $p$ <.001). Similarly, a one-unit increase in food insecurity at T1 was associated with 63% higher odds of parents meeting PHQ-8 criteria for major depression at T2 (OR = 1.63, $p$ <.001). Multivariate linear regression analyses showed that a one standard deviation increase in food insecurity at T1 was associated with a 0.16 standard deviation increase in parenting stress at T2 (β = 0.16, $p$ =.008). Finally, a one standard deviation increase in food insecurity at T1 was associated with a 0.15 standard deviation increase in child anxiety at T2 (β = 0.15, $p$ =.014).

### 3.2. Material social support

Table 3 displays displays the results from regression models with material social support as the main predictor. Results from multivariate logistic regression analyses showed that a one-unit increase in material social support at T1 was associated with 10% lower odds of parents meeting GAD-7 criteria for anxiety at T2 (OR = 0.90, $p$ =.014). Similarly, a one-unit increase in material social support at T1 was associated with 15% lower odds of parents meeting PHQ-8 criteria for major depression at T2 (OR = 0.85, $p$ <.001). Multivariate linear regression analyses showed that a one standard deviation increase in material social support at T1 was associated with a 0.20 standard deviation decrease in parenting stress at T2 (β = -0.20, $p$ =.001). Further, a one standard deviation increase in material social support at T1 was associated with a 0.13 standard deviation decrease in child anxiety at T2 (β = -0.13, $p$ =.028).

## 4. Discussion

The COVID-19 pandemic had detrimental effects on the mental health and wellbeing of children and families across the globe. Parents in particular faced numerous stressors, including heightened child-rearing demands and home-based education responsibilities (Freisthler, et al., 2021; Kerr et al., 2021; Lee et al., 2021a; Patrick et al., 2020; Rodriguez et al., 2021). High unemployment rates and decreased access to services such as free-and reduced-cost lunch likely contributed to further difficulties in parenting and child rearing for many families. Even during non-pandemic times, food insecurity and material hardship are well documented predictors of poorer mental health outcomes (Jones, 2017; Myers, 2020). Using longitudinal data from a national survey, this study examined how food insecurity and material social support in the very early days of the pandemic related to parent and child mental health outcomes. We note that one facet of the current study is that it captures parents' adaptations to the pandemic during the highly uncertain time in March and April 2020, at a time when the COVID-19 pandemic resulted in millions of American adults losing their

**Table 2**
Multivariate regression results, food insecurity (N = 359).

| | Anxiety | | | Depression | | | Parenting Stress | | | Child Anxiety | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR | SE | p-value | OR | SE | p-value | B | SE | p-value | B | SE | p-value |
| Food insecurity | **1.52** | 0.14 | <0.001 | **1.63** | 0.14 | <0.001 | **0.16** | 0.06 | 0.008 | **0.15** | 0.06 | 0.014 |
| SD Days | 1.01 | 0.01 | 0.402 | 1.00 | 0.01 | 0.821 | −0.02 | 0.06 | 0.690 | 0.03 | 0.06 | 0.572 |
| Lockdown Days | 1.02 | 0.01 | 0.087 | 1.02 | 0.01 | 0.148 | 0.09 | 0.06 | 0.136 | −0.01 | 0.06 | 0.852 |
| Age | 0.97 | 0.02 | 0.167 | 0.99 | 0.02 | 0.621 | 0.00 | 0.05 | 0.973 | **0.13** | 0.05 | 0.018 |
| Female | 1.64 | 0.51 | 0.211 | 1.63 | 0.51 | 0.214 | −0.01 | 0.06 | 0.870 | 0.00 | 0.06 | 0.953 |
| Income | 0.95 | 0.08 | 0.513 | 0.90 | 0.07 | 0.183 | −0.05 | 0.07 | 0.456 | −0.03 | 0.07 | 0.650 |
| Cohabitating | 0.95 | 0.31 | 0.876 | **0.59** | 0.19 | 0.028 | −0.05 | 0.06 | 0.376 | −0.06 | 0.06 | 0.324 |
| Black | **0.39** | 0.17 | <0.001 | **0.46** | 0.19 | 0.004 | **−0.13** | 0.05 | 0.012 | **−0.17** | 0.05 | 0.001 |
| Hispanic | 1.15 | 0.48 | 0.753 | 0.91 | 0.39 | 0.821 | −0.04 | 0.05 | 0.466 | −0.04 | 0.05 | 0.485 |
| Other | **0.38** | 0.20 | 0.002 | 0.71 | 0.34 | 0.388 | −0.01 | 0.05 | 0.923 | **−0.12** | 0.05 | 0.022 |
| Some college | 0.59 | 0.23 | 0.071 | 0.77 | 0.29 | 0.437 | 0.12 | 0.08 | 0.135 | 0.10 | 0.08 | 0.198 |
| Bachelor's | 0.99 | 0.42 | 0.975 | 0.77 | 0.33 | 0.486 | 0.14 | 0.09 | 0.114 | 0.13 | 0.09 | 0.134 |
| Employment change | 1.02 | 0.31 | 0.954 | 0.63 | 0.19 | 0.056 | −0.02 | 0.05 | 0.666 | 0.03 | 0.05 | 0.596 |

*Note*: OR = odds ratio, SE = standard error, SD = social distancing. Comparison category for Black and Hispanic is White. Comparison category for some college and bachelor's is high school or less. Bolded numbers are statistically significant at p <.05.

**Table 3**
Multivariate regression results, material social support (N = 359).

| | Anxiety | | | Depression | | | Parenting Stress | | | Child Anxiety | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR | SE | p-value | OR | SE | p-value | B | SE | p-value | B | SE | p-value |
| Material social support | **0.90** | 0.04 | 0.014 | **0.85** | 0.04 | <0.001 | **−0.20** | 0.06 | 0.001 | **−0.13** | 0.06 | 0.028 |
| SD Days | 1.01 | 0.01 | 0.386 | 1.00 | 0.01 | 0.796 | −0.02 | 0.06 | 0.702 | 0.03 | 0.06 | 0.566 |
| Lockdown Days | 1.02 | 0.01 | 0.129 | 1.02 | 0.01 | 0.191 | 0.08 | 0.06 | 0.167 | −0.01 | 0.06 | 0.810 |
| Age | 0.97 | 0.02 | 0.104 | 0.99 | 0.02 | 0.471 | 0.00 | 0.05 | 0.975 | **−0.12** | 0.07 | 0.023 |
| Female | 1.55 | 0.47 | 0.247 | 1.45 | 0.44 | 0.308 | −0.03 | 0.06 | 0.574 | −0.10 | 0.06 | 0.882 |
| Income | 0.89 | 0.07 | 0.122 | **0.86** | 0.07 | 0.026 | −0.05 | 0.07 | 0.493 | −0.04 | 0.07 | 0.538 |
| Cohabitating | 0.96 | 0.31 | 0.896 | **0.62** | 0.19 | 0.047 | −0.05 | 0.06 | 0.398 | −0.05 | 0.06 | 0.331 |
| Black | **0.39** | 0.17 | <0.001 | **0.46** | 0.18 | 0.003 | **−0.14** | 0.05 | 0.008 | **−0.17** | 0.05 | 0.001 |
| Hispanic | 1.16 | 0.47 | 0.734 | 0.94 | 0.38 | 0.872 | −0.04 | 0.05 | 0.459 | −0.04 | 0.05 | 0.486 |
| Other | **0.46** | 0.23 | 0.018 | 0.85 | 0.39 | 0.701 | 0.01 | 0.05 | 0.932 | **−0.11** | 0.05 | 0.032 |
| Some college | 0.60 | 0.22 | 0.068 | 0.82 | 0.30 | 0.539 | 0.13 | 0.08 | 0.097 | 0.11 | 0.08 | 0.175 |
| Bachelor's | 0.87 | 0.36 | 0.706 | 0.75 | 0.30 | 0.407 | 0.16 | 0.09 | 0.076 | 0.139 | 0.09 | 0.122 |
| Employment change | 1.30 | 0.37 | 0.426 | 0.80 | 0.23 | 0.393 | −0.02 | 0.05 | 0.722 | 0.04 | 0.05 | 0.457 |

*Note*: OR = odds ratio, SE = standard error, SD = social distancing. Comparison category for Black and Hispanic is White. Comparison category for some college and bachelor's is high school or less. Bolded numbers are statistically significant at p <.05.

employment and the majority of American children being cut off from school sources of food support, thus reflecting a time of high economic and food insecurity.

Results suggest that food insecurity was associated with higher parent anxiety, depression, and parenting stress. These results align with pre-pandemic (Jones, 2017) and during-pandemic (Waxman et al., 2020) research that documents the link between access to food-related services and adult mental health outcomes. Prior research has underscored important predictors of parental mental health during COVID-19, such as social isolation, loneliness, and financial concerns (Lee et al., 2021; Lee et al., 2022; Rodriguez et al., 2021). The current study extends this body of knowledge and suggests that food insecurity in particular was an important predictor of parenting during COVID-19. Likewise, food insecurity was predictive of child anxiety, potentially showing the ill effects that decreased access to food-related resources can have on children.

Our results suggest that, in addition to food insecurity, material social support was also related to parent and child wellbeing. Specifically, material social support was associated with better parent mental health outcomes and lessened child anxiety. This signals that parents who feel they can rely on members of their family or community to provide material support in a state of emergency may exhibit better adjustment during the COVID-19 pandemic. Further, it is possible that the lessened stress that results from those supportive communities has a beneficial "spillover" effect on the child. It is important to note that our measure of material social support specifically measures *perceived* support, and did not assess whether parents actually relied on or utilized such support. Therefore, it is possible that simply the perception of being able to reach out for help has a beneficial effect on family wellbeing (Lakey & Orehek, 2011). On the other hand, it is also possible that parents who perceive high amounts of material social support tend to disproportionately come from less marginalized and oppressed communities, which accounts for advantageous mental health outcomes. While our study did control for some of these factors, including race/ethnicity, income, employment changes, and education level, future research should consider other factors such as housing security, perceived racial discrimination, and historical trauma to better understand how perceptions of material social support relate to health outcomes.

While examining both parent and child mental health outcomes was a significant strength of this study, we did not examine other potentially important outcomes, such as harsh parenting. Some research suggests that food insecurity is linked to more harsh parenting practices that raise risk for child abuse and neglect (Nguyen et al., 2020), further underscoring the need to reduce food insecurity for vulnerable families. Relatedly, we also did not examine the association between material hardship and other potentially important outcomes, such as marital conflict. According to the family stress model (Conger et al., 2000), economic hardship predicts poorer parent mental health, which then predicts couple relationship conflict. Although this study showed evidence for a direct effect between material social support and child anxiety, future research could examine whether material social support is related to better child outcomes via improved relationship quality. Indeed, some research shows that couples increased in verbal fighting in the early days of the pandemic (Lee et al., 2021c). Similarly, researchers

should continue to explore the mechanisms linking food and material hardship to parenting outcomes to determine the best areas of intervention.

### 4.1. Policy and practice implications

An important policy need is to address the experiences of vulnerable populations of children, such as race and ethnic minority children. This is an important gap of the current study, given that COVID-19 had a disproportionate impact on face and ethnic minority children. Compared to children in White and Asian households, children in Black and Latinx households were nearly three times more likely to experience a range of indicators of economic hardship during the pandemic (Padilla & Thompson, 2021). Appropriate policies that target these communities, including policies involving material support and food security, may be needed. Alongside these policies, practitioners who work with parents and children, especially those who are racial and ethnic minorities, may need to be mindful of conducting regular needs assessments and connecting families with appropriate community-based resources as they address food insecurity and mental health symptoms. Further, clinicians can provide psychoeducation regarding how financial and food-related stress may spill over into children's mental health, and help parents understand the signs and symptoms of child anxiety.

Additionally, our study speaks to the stress and detrimental mental health outcomes parents exhibited in the early days of the pandemic, when schools were closed and lockdowns were in place. Parents were expected to care for their children for longer periods of time, while also attempting to manage work and other familial responsibilities. The Lancet's COVID-19 Commission Mental Health Task Force advised prioritizing access to childcare and elementary education during COVID-19, as such access has advantages for children's social development, learning, and nutrition, while also allowing parents to attend to their work with minimal distractions (Allen et al., 2021). Our study provides further empirical evidence supporting the Task Force's recommendations, and speaks to the importance of prioritizing safe access to education and COVID-19 continues. Concurrently, as parents work with practitioners to make decisions on their child's schooling, practitioners may best guide these families by taking both the parent's and the child's mental health symptoms into consideration.

Along a similar vein, COVID-19 underscored the need to enhance the social safety net for children. Our study shows that, when parents experience food insecurity and feel a lack of material support, children can be adversely affected. Services such as the school lunch program are critical in addressing food insecurity about vulnerable families with school-aged children. Yet, COVID-19 demonstrated the deficiencies of a system that relies on schools as a primary mechanism of service delivery. In an emergency public health crisis situation, a school-based approach to addressing food insecurity was clearly not adequate, and more comprehensive services were needed. Therefore, practitioners will need to stay abreast of innovative community-based food programs that continue to be developed as the COVID-19 pandemic evolves. For example, the Healthy Food Alliance for Early Education (HFAEE) program improved nutrition and health practices among families experiencing food insecurity in St. Louis, Missouri (Ramos et al., 2021). Through a public–private partnership in the state of Michigan, Michigan Bridges helped families get connected to emergency food assistance during the pandemic (Michigan Department of Health and Human Services, 2021). In a nationwide assessment of initial community-based responses to food insecurity, researchers found clear food-related resources on jurisdictions' websites, but that communication and outreach to families were limited (McLoughlin et al., 2020). Therefore, practitioners may be able to bridge such gaps when working with families from low-income communities.

Weaknesses in school-based approaches to food insecurity were partially addressed by the CARES act (Roll, & Grinstein-Weiss, 2020), which provided stimulus checks to parents, helped schools provide more meals to children, expanded the Supplemental Nutrition Assistance Program (SNAP; with additional funds going toward food access for indigenous populations), and provided more resources to food distribution programs. Research shows that such policy responses helped to reduce food insecurity (Molitor & Doerr, 2021). However, these resources do not always reach America's most vulnerable families (Gassman-Pines & Gennetian, 2020; Roll & Grinstein-Weiss, 2020). For example, nearly 9 million eligible people did not receive the CARES Act stimulus check, with disproportionate numbers of Black and Hispanic families reporting that they did not receive the funds despite being eligible (Roll & Grinstein-Weiss, 2020). Therefore, further research should be conducted to ensure that minority and oppressed populations have sufficient access to and knowledge of these services. Community-based mental health workers and therapists may be able to bridge some of these gaps by engaging in casework that connects these vulnerable populations to relevant services. Indeed, research conducted during COVID-19 suggests that many successful connections to food and material-related resources were given in the context of individual casework, which required "close and trusting relationships" (Dempsey & Pautz, 2021, p. 17). However, some mothers from disenfranchised communities felt that caseworkers conducted meetings as interrogations and failed to provide clear explanations when applications for benefits were denied, which resulted in further mental strains on low-income families (Elliott et al., 2021). These studies underscore the importance of relationships between caseworkers and community members during the COVID-19 pandemic.

### 4.2. Limitations

A number of limitations should be considered when interpreting our results. Our sample consisted of parents who were mostly mothers (67.5%) and identified as White (69.6%). Minority parents were underrepresented in this study, most likely due to the nature of our sampling approach which relied upon an existing research respondent database via the Prolific platform. At the time the survey was conducted, the use of an online survey was especially appropriate, given that non-essential in-person activities were prohibited to prevent the spread of the coronavirus (The White House, Office of the Press Secretary, 2020). Further, parents in our study had an average income between $40 k-$50 k, and many (44.6%) had a bachelors degree. Therefore, our study does not accurately capture experiences of low-income or less educated parents, and cannot be generalized to all U.S. families.

Although our study was longitudinal in nature, we cannot infer causality. Additionally, we cannot conclude with absolute certainty that the associations found in this study are the result of COVID-19 in part because we do not have pre-pandemic measures of adult and child mental health. All measures in this study were based on self-report data, meaning that our analyses are potentially subject to parents' perceptions, biases, or inaccurate reporting. Similarly, child behavior problems were measured via parental report of the CBCL, and thus parents' mental health states or biases may have impacted child anxiety scores. However, this limitation is balanced by the fact that we captured child outcomes at a time when most little research was capturing effects of COVID-19 on children. Finally, the short-term nature of this longitudinal study should be considered, with follow-up occurring only 2 weeks after the first survey in April 2020. Although this is a study limitation, it may be interpreted as a strength that we capture food insecurity and economic hardship and associations with wellbeing early in the pandemic, at the peak of school closures and before most large-scale government policies were put in place to alleviate economic and food insecurity. Study results should be interpreted with these caveats in mind.

## 5. Conclusion

Using longitudinal data from a national sample of parents in the early

days of the pandemic, this study examined how food insecurity and material social support related to parent and child mental health outcomes. Our study suggests that food insecurity is a risk factor for poorer parent and child mental health, while perceived material social support is a promotive factor. As COVID-19 continues, researchers should monitor parental access to food and material support, particularly among vulnerable and oppressed populations. Structural forms of social support can be measured through support provided by both formal networks, such as schools and religious organizations, as well as through informal support provided by friends, family and neighbors. Through the CARES act, access to food-related services including SNAP, food banks, and school lunch have been expanded; however, researchers should ensure that racial and ethnic minority parents, indigenous parents, and parents from rural and low-income households have access to these services. Promoting food security and increasing material support may improve the mental health of both parents and children.

### *CRediT authorship contribution statement*

**Kaitlin P. Ward:** Conceptualization, Investigation, Methodology, Software, Formal analysis, Visualization, Writing – original draft. **Shawna J. Lee:** Conceptualization, Investigation, Methodology, Data curation, Writing – review & editing, Supervision, Project administration, Funding acquisition.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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