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Parenting activities and the transition to home-based education during the COVID-19 pandemic☆

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ABSTRACT

This study reports on parent-child dynamics during initial COVID-19 related school closures, based on cross-sectional analyses of a survey that utilized a convenience sampling approach. Data were collected in April 2020, approximately five weeks after the World Health Organization declared that the Coronavirus was a pandemic. Participants (N = 405) were adults recruited throughout the U.S. This study examines data from parents (69% mothers and 31% fathers) with at least one child 0–12 years of age. The majority were White (71%) and 41% had at least a bachelor's degree. The majority of parents (78%) were educating their child at home due to COVID-19. Most (77.1%) reported use of online tools for at-home education, including educational apps, social media, and school-provided electronic resources. More than one-third (34.7%) of parents said their child's behavior had changed since the pandemic, including being sad, depressed, and lonely. Most parents were spending more time involved in daily caregiving of their children since COVID-19. Two out of every five parents met the PHQ-8 criteria for major depression or severe major depression (40.0%) and the GAD-7 criteria for moderate or severe anxiety (39.9%). Multivariate analyses indicated that, compared to non-depressed parents, parents who met criteria for probable major or severe depression (B = −0.16, 95% CI = [−0.29, −0.02], p = .021) and parenting stress (B = −0.37, 95% CI = [−0.47, −0.27], p < .001) were negatively associated with parents' perceived preparation to educate at home. Compared to parents with minimal or mild anxiety, parents with moderate or severe anxiety reported higher child anxiety scores (B = 0.17, 95% CI = [0.06, 0.28], p = .002). Parenting stress was also positively associated with higher child anxiety scores (B = 0.40, 95% CI = [0.32, 0.48], p < .001). Content analyses of open-ended questions indicated that school closures were a significant disruption, followed by lack of physical activity, and social isolation. Overall, study results suggested that parents' mental health may be an important factor linked to at-home education and child wellbeing during the pandemic.

1. Introduction

The COVID-19 pandemic ushered in enormous disruptions to family life. Social distancing mandates in the U.S. (The White House, Office of the Press Secretary, 2020) and across the globe resulted in millions of children being abruptly disconnected from in-person education. These changes created numerous educational challenges for children (United Nations Educational, Scientific and Cultural Organization, 2020; United Nations Children's Fund, 2020a) and left most parents with little time to prepare to support their child's education. Social distancing removed many of the social, educational, and community supports that buffer families in times of crisis. Millions of families simultaneously experienced economic hardship. In the week ending March 21, 2020, the U.S. Department of Labor reported that 2.9 million people filed for unemployment, which was a 1000-fold increase from the previous week (U.S. Department of Labor, 2020). By the end of April 30, 2020, 30 million Americans had filed for unemployment benefits (Horsley, 2020). According to the American Psychological Association, 74% of parents reported that disrupted routines and adjusting to new routines were significant stressors (American Psychological Association [APA], 2020).

During COVID-19, the United Nations estimated that worldwide about 463 million children were cut off from education altogether, due

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to their inability to access remote learning (United Nations Children's Fund, 2020b). The widespread shift from in-person education to at-home education was unprecedented in recent American history. School closures were estimated to have impacted approximately 55.1 million students in 124,000 public and private schools across the U.S. (Education Week, 2020). In addition, in the U.S., most after-school activities (e.g., child care, sports, clubs, and other extracurricular activities) and specialized programs (e.g., services provided to children with disabilities) were cancelled or disrupted.

Similar to previous public health crises and natural disasters, one concern during the COVID-19 pandemic was maintaining children's education in the wake of widespread school closures. In the aftermath of Hurricane Katrina, public schools were not able to fully support the needs of all students, especially students of color and students experiencing poverty and homelessness (Shavers, 2006). After Hurricane Katrina, 75% of the students in one study reported that they experienced declines in academic achievement (Peek & Richardson, 2010). During previous global health crises, such as severe acute respiratory syndrome (SARS) and influenza A (H1N1), research documented conflicts between parental work responsibilities and children's educational needs, lack of effective communication between parents and schools, and a lack of inclusive procedures to provide students access to needed resources and services (Boon et al., 2011; Braunack-Mayer, Tooher, Collins, Street, & Marshall, 2013; O'Sullivan et al., 2009).

1.1. Homeschooling and the shift to remote education at home

Homeschooling is the provision of educational activities in the home, usually by the child's parent. Prior to COVID-19, approximately 1.7 million U.S. children were homeschooled. Homeschooling was on the rise, from 1.7% of all U.S. students between the ages of 5 and 17 in 1999, to 3.3% of all U.S. students between the ages of 5 and 17 in 2016 (National Center for Education Statistics, 2019). Homeschooling appears to be more common among religious parents, politically conservative parents, two-parent families, and rural families (Hartman, Stotts, Ottley, & Miller, 2017; Lines, 2001). Homeschooling parents use a variety of educational approaches, and one study indicated that 41% of parents use online education for homeschooling (Davis, 2011). There is little research on the outcomes of children who are homeschooled. One study suggested that on average, children who are homeschooled score above or at grade level (Lines, 2001).

In this study, we distinguish homeschooling, a deliberate decision by the parent to deliver an educational curriculum in a home-based setting, with the situation early in the COVID-19 pandemic, in which educational activities were delivered by or supervised by the parent at home because of the suspension of in-person education and the closure of school buildings. With in-person educational activities disrupted, many schools turned to online resources to facilitate at-home education. However, initially during COVID-19, most schools made the transition with little preparation, and solutions were spotty at best (Nuñez, Stuart-Cassel, & Temkin, 2020). Many families were not able to adequately access online education due to a variety of factors. One report documented that 14.5 million U.S. households did not have access to the internet or personal computers; thus, online education was not readily available for children in these households (Institute for Children, Poverty, & Homelessness, 2020). Not all households that lack internet access are in rural areas. Children who are homeless or socioeconomically disadvantaged also lacked reliable access to the internet or electronic tools (computers and tablets). In New York City, one region hit particularly hard by COVID-19, as many as 300,000 students did not have internet-connected devices at home (Institute for Children, Poverty, & Homelessness, 2020). To the best of our knowledge, to date there are no national estimates of how many parents were able to use online resources to provide at-home education for their children during the time period examined in the current study (i.e., April 2020).

Another challenge in the shift to at-home education was the burden placed on parents. At a minimum, at-home education requires parental supervision at times when children would have otherwise been supervised by school personnel in school buildings. In many cases, at-home education necessitates greater involvement from parents to ensure that children understand and complete educational activities. This may be especially true for parents of young children and children with disabilities.

These responsibilities conflicted with employment for millions of American parents. Prior to COVID-19, there were 22 million two-parent households in the U.S. (U.S. Census Bureau, 2018), and in the majority of those households (61.1%) both mothers and fathers were working full-time (U.S. Department of Labor, 2017). Parents in single-parent headed households, which comprise 11 million American families with children under 18 years old (U.S. Department of Labor, 2017), likely faced even more difficult conditions as they struggled to balance work, child care and at-home education during the pandemic, without the benefit of a second parent to "tag team" responsibilities. This raises the question of how parents, most of whom were working in order to provide for their families, adjusted to supervising or providing at-home education.

In addition, lack of time to prepare, as well as mental health concerns, worries, and parenting stress, may have impeded parents' ability to support their children's educational needs. During COVID-19, parents reported higher levels of stress when compared to adults without children (APA, 2020) and worsening mental health overall (Patrick et al., 2020). More than 7 in 10 parents reported that managing distance/online learning for their children and routine disruptions/adjusting to new routines were stressful (APA, 2020). A high level of food insecurity, loss of health insurance, and child care disruptions were common strains among parents during the pandemic (Patrick et al., 2020).

There is relatively little data on the mental health of children during the pandemic (Lee, 2020). One study noted that parents reported worsening behavioral health for their children (Patrick et al., 2020). The lack of in-person school activities disrupted children's access to caring adults such as teachers, coaches, and school social workers (Sacks & Jones, 2020). Given the extent of these disruptions, it is reasonable to anticipate that millions of children may have experienced elevated anxiety, worries, and trauma. The worsening of parental mental health (APA, 2020; Patrick et al., 2020) – such as increased levels of depression and anxiety – also may have negative consequences for child wellbeing.

1.2. The current study

This study captures a snapshot of parent-child activities, at-home educational activities, and wellbeing six weeks after the World Health Organization (WHO) announced that COVID-19 was a pandemic (WHO, 2020a, 2020b). In this current study, we describe parents' involvement with their children in daily caregiving activities, parents' daily schedule disruptions, and the types of resources parents were using to provide at-home education to their children. In multivariate models, we examine parenting risk factors associated with parents' perceived preparation to provide at-home education. We also examine how parental wellbeing may influence parents' perception of their children's anxiety. We present qualitative analyses using thematic content coding to examine parents' responses to open-ended questions about common daily disruptions, the use of technology for children's education, parents' perceived changes in child behavior, and parents' perceptions of what children need during the COVID-19 pandemic.

2. Methods

2.1. Procedures

Data for the current study were collected via an online survey that was administered through Prolific, a company that conducts survey research. The survey was launched on April 2, 2020, nearly five weeks

after the WHO declared that the Coronavirus was a pandemic, and four weeks after the White House issued social distancing guidelines to slow the spread of COVID-19. Survey participants were recruited from geographic locations throughout the U.S.; however, it is important to note that the survey procedures utilized a convenience sampling approach and that the current sample is not nationally representative.

Participants who met study criteria were sent an email from Prolific regarding their eligibility to participate in the survey. Participants were provided with a brief description of the survey via the Prolific website. In order to be eligible, individuals had to have U.S. nationality and be age 18 or older. If they chose to participate in the survey, they were linked through the Prolific platform to a Qualtrics survey designed and managed by the research team. The research team set a predetermined target enrollment number, and when that number was reached, the survey automatically closed.

After reviewing the study information and providing informed consent, participants completed the survey and received payment ($6.00), which was administered directly to participants via Prolific. The average completion time was 40 minutes long (range: 13–147 minutes). To ensure the quality of the data, three attention checks were embedded throughout the survey. None of the participants failed more than one of the attention checks. All data provided to the research team were anonymous and contained no identifying information. This study was reviewed and deemed exempt from oversight by the University of Michigan Institutional Review Board.

2.2. Study participants

A total of 654 adults residing in the U.S. completed the survey. The analytic sample for the current study included parents with at least one child living at home between the ages of 0–12 years ($N = 405$, or 61.9% of the total sample), of which 69% were mothers and 31% were fathers. 78% of participants said they were currently educating their child at home due to COVID-19. As seen in Table 1, the average age was 34 years. Approximately 41% of participants had at least a bachelor's degree and the majority of participants identified as White (71%). Average household income in the prior year was between $40,000 and $50,000. Approximately 24% of participants indicated their employment status had changed due to COVID-19.

2.3. Study measures

2.3.1. Parental perceived preparation to educate at home

Three items assessed parents' perceived feelings of preparation to educate their children at home. Items were only given to parents who indicated they were currently educating their child(ren) at home. Items included, "I feel prepared to educate my child at home," "I do not have the resources I need to educate my child at home" (reversed), and "I have felt overwhelmed by responsibilities to educate my child at home" (reversed), which were rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal reliability of the scale was good ($\alpha = 0.82$).

2.3.2. Parental involvement in caregiving

Increases in parental involvement in daily caregiving activities was measured with items that were adapted from Fragile Families and Wellbeing Study (FFCWS). The original items from FFCWS included: played games, played with toys, read books, hugged/showed physical affection, ate meals together, told stories, sang songs, and put child to bed (Center for Research on Child Wellbeing, April 2013). For this study, we added two additional items: watched TV or other media and went on walks. Parents were asked to indicate whether, in the past 2 weeks, they had engaged in this activity with the child: *NA/I don't engage in this behavior* [coded as missing], *I have done this less than usual, I have done this about the same amount as I usually do, I have done this a little bit more than I usually do, I have done this a lot more than I usually do*. We created a dichotomous variable to indicate whether or not the parent had engaged in the behavior more often than usual (0 = *engaged less often or the same amount*, 1 = *engaged more often*).

Table 1
Descriptive statistics of study variables (N = 405).

	M	SD	Min	Max	*n*	%
Female					276	68.7
Cohabitating					323	80.0
Employment changed due to Covid-19					97	24.0
Income						
$10–20k					71	17.7
$20–30k					68	17.0
$30–40k					58	14.4
$40–50k					48	11.9
$50–70k					51	12.7
$70–90k					49	11.5
$90k or more					58	14.4
Race and ethnicity						
White					286	70.9
Black					44	10.9
Hispanic					42	10.4
Other					32	7.9
Education						
High school					57	14.1
Some college					180	44.4
College plus					168	41.5
Educating child at home due to Covid-19					315	77.8
Social distancing days	26.0	10.52	0	60		
Lockdown days	19.58	10.67	0	60		
Age	34.41	7.16	19	56		
Child anxiety	0.23	0.29	0	1.5		
Parenting stress	0.77	0.71	0	3		
Preparation to educate at home	3.26	1.15	1	5		
Parental depression					158	40.0
Parental anxiety					159	39.9
Child's behavior changed since Covid-19					140	34.7

Note: Due to missing data on some study variables, not all responses to individual items sum to 405. Cohabitation status was coded (0 = *not cohabitating [*i.e., *single, never married; separated; or divorced]*, 1 = *cohabitating [*i.e., *married; cohabitating with partner; or domestic partnership*]). Comparison category for female was male (i.e., 0 = *male*, 1 = *female*).

2.3.3. Daily schedule disruptions

Daily schedule disruptions were measured by asking parents whether their child(ren) had experienced the following because of the Coronavirus/COVID-19 global health crisis: public school closed; private school closed; child or daycare closed; preschool closed; sports activities cancelled; lessons (dance, gymnastics, etc.) cancelled; playdates with other children cancelled; not able to receive free or reduced cost breakfast at school; and not able to receive free or reduced cost lunch at school (0 = *no*, 1 = *yes* [*not applicable* coded as missing]). Qualitative responses were prompted by using an open-ended question, "Please tell us about other disruptions to your child's schedule because of the Coronavirus/COVID-19 global health crisis." In a text box, participants provided words or phrases that would help us understand what daily schedule disruptions parents experienced. Participants who did not wish to respond typed "No response" or left the text box blank.

2.3.4. Resources to educate at home

Resources to educate at home were measured by asking parents to indicate how much they agreed with three statements: "I have support from my child's school to educate my child at home," "I have collaborated with other parents to provide resources for educating my child at home," and "I have used online or social media resources to educate my child at home" (1 = *strongly disagree*, 5 = *strongly agree*). These questions were only given to parents who indicated they were currently educating their child(ren) at home ($n = 315$).

2.3.5. Use of technology for child education

Parents' use of technology for child education and entertainment was assessed using an open-ended question, "What online resources have been the most helpful in educating your child at home?" In a text box below the question, participants provided words or phrases to respond. Participants who did not wish to respond typed "No response" or left the text box blank.

2.3.6. Child anxiety

Child anxiety was measured using the child anxiety subscale of the Child Behavior Checklist/4–18 (Achenbach, 1992). Participants were asked, "Since approximately 2 weeks ago, my child(ren):" and were presented with 14 items that were rated on a 3-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 ($\alpha = 0.87$).

2.3.7. Child behavior changes

Parents were asked, "In your opinion, has your child(ren)'s behavior changed in the past 2 weeks, during the Coronavirus/COVID-19 global health crisis?" Those who responded "yes" ($n = 140$; 34.7%) to this question were subsequently asked to provide responses to an open-ended question that examined parents' perceived changes in their child's behavior, "How has your child(ren)'s behavior changed in the past 2 weeks, since the Coronavirus/COVID-19 global health crisis?" In a text box below the question, participants provided words or phrases to respond. Participants who did not wish to respond typed "No response" or left the text box blank.

2.3.8. Child needs

To help us understand what children need during COVID-19, parents were asked an open-ended question, "What do you think your child(ren) need during this global health crisis?" Participants provided words or phrases to describe their response in a text box below the question. Participants who did not wish to respond typed "No response" or left the text box blank.

2.3.9. Parental depression

Depression was measured with the 8-item Personal Health Questionnaire (PHQ-8; Kroenke et al., 2009). The PHQ-8 is a valid diagnostic tool to measure severity 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*).

2.3.10. Parental anxiety

Anxiety was measured using the Generalized Anxiety Disorder, 7-item scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006). The GAD-7 is a widely used and well validated diagnostic tool to measure anxiety symptoms 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*).

2.3.11. 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 [FFCWS]). This measure has been widely used to examine parenting stress to (Ehrle & Moore, 1997) including in the Child Development Supplement of the Panel Study of Income Dynamics (Hofferth, Davis-Kean, Davis, & Finkelstein, 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). Items were measured on a scale from 1 (*never true*) to 4 (*always true*), ($\alpha = 0.83$).

2.4. Control variables

2.4.1. Sociodemographic and other controls

Participants' sex (0 = *male*, 1 = *female*) and cohabitation status (0 = *not cohabitating [*i.e.*, single, never married; separated; or divorced]*, 1 = *cohabitating [*i.e.*, married; cohabitating with partner; or domestic partnership]*) were modeled as dichotomous variables. Race and ethnicity was coded as a series of dummy variables (*White* [comparison category], *Black, Hispanic, Other*). Education level was also coded as a series of dummy variables (*high school or less* [comparison category], *some college*, *college degree or higher*). Total household income in the last year before taxes was treated as a continuous variable: 1 = *$10–20k*, 2 = *$20–30k*, 3 = *$30–40k*, 4 = *$40–50k*, 5 = *$50–70k*, 6 = *$70–90k*, 7 = *$90k or more*. Parent age was continuous and measured in years. The number of days spent social distancing and number of days spent in "lockdown" were continuous. We measured these factors to control for social isolation that may have impacted both the independent and dependent variables in the study models. A dichotomous variable indicated whether participants had experienced an employment change due to COVID-19: "Has your employment status changed (e.g., laid off, furloughed) because of the Coronavirus/COVID-19 global health crisis?" (0 = *no*, 1 = *yes*).

2.5. Analysis plan

Our analyses included quantitative analysis of close-ended questions and qualitative analysis (content coding) of open-ended questions. For quantitative analyses, data cleaning and descriptive analyses were run in Stata version 15.1. All regression analyses were run in Mplus version 8 (Muthen & Muthen, 1998–2017) using the maximum likelihood estimator. For descriptives of parental involvement in child caregiving activities and daily schedule disruptions, parents who answered "NA/I don't engage in this behavior" were coded as missing so that we could examine the percentage of parents who engaged in these behaviors more often than they normally do. For parental at-home education resources, rated from 1 to 5, we calculated the percentage of parents who indicated they "agreed" or "strongly agreed" (i.e., rated a 4 or 5).

Missing data on our key independent variables of interest—including depression, anxiety, and parenting stress—were < 3%. Regarding our key dependent variables, because the home preparation items were only presented to parents who were educating their children from home ($n = 315$), the home preparation had 22.2% missing data for the 315 parents

who were given this question, there were given this question, there were no missing data. Child anxiety did not have any missing data. To handle missing data, analyses were conducted using full-information maximum likelihood estimation (FIML), which uses all available data. To examine whether our independent variables were associated with missingness on the home preparation scale, we ran a logistic regression analysis where all of our independent variables predicted whether participants were missing data (0 = *not missing*, 1 = *missing*) on the home preparation scale. The only variable that predicted missingness on the home preparation scale was parental age (Odds Ratio: 0.92, SE = 0.02, $p < .001$).

For qualitative analyses, two of the study co-authors content-coded the open-ended questions. First, they independently read responses and separately identified global themes. Second, the research team (including all study authors) collectively discussed the identified themes, established mutually agreed upon themes, and based on those themes, developed a codebook for identifying and coding responses. Third, the two main coders independently coded responses. To establish inter-rater reliability, the research team identified 20 responses that were randomly selected from the responses. Each co-author independently and separately coded the 20 responses to the open-ended questions and met to compare responses, thus establishing inter-rater reliability. Overall, inter-rater reliability was good, and ranged from 80% to 95%.

3. Results

3.1. Quantitative results

3.1.1. Descriptive results

Descriptive statistics of participant characteristics can be found in Table 1. Notably, 40.0% of the parents in this sample met the PHQ-8 cutoff score for major depression, and 39.9% met the GAD-7 cutoff score for moderate or severe anxiety. More than one-third (34.7%) of parents said their child's behavior had changed since the pandemic. Descriptive results for changes in parental involvement in caregiving after COVID-19, daily schedule disruptions, and resources to educate at home are presented in Table 2. In terms of parental involvement, parents said that they were engaging in most caregiving activities more often since COVID-19, specifically parents were playing games with child(ren) more often (68.7%), watching TV or other media with child(ren) more often (65.1%); and playing with toys with child(ren) more often (56.9%). Regarding daily schedule disruptions, 97.1% of parents indicated public schools were closed and over half of parents who typically utilize free/reduced meal services indicated they were unable to receive free or reduced cost breakfast or lunch. The questions related to parental at-home education resources were asked of the 78% of participants who said they were educating their child at home. The majority of these parents endorsed that they were using online or social media resources to educate their child(ren) at home (77.1%) and agreed they had support from their child(ren)'s school to educate their child(ren) at home (71.3%). However, only 22.5% had collaborated with other parents to provide resources to educate their child(ren) at home.

Table 2
Descriptive results of parental involvement in caregiving, daily schedule disruptions and resources to educate at home.

	n	%
Parental Involvement in Caregiving		
Played games more often	399	68.7
Watched TV or other media more often	398	65.1
Played with toys more often	385	56.9
Went on walks more often	375	55.5
Read books more often	388	54.9
Hugged/physical affection more often	403	53.6
Ate meals more often	403	53.6
Told stories more often	378	43.5
Sang songs more often	362	40.1
Put child(ren) to bed more often	392	20.9
Daily Schedule Disruptions		
Public schools closed	280	97.1
Private schools closed	89	90.8
Child are daycare closed	144	86.8
Preschool closed	125	92.0
Lessons (dance, gymnastics, etc.) cancelled	194	96.4
Play dates with other children cancelled	332	96.1
Unable to receive free/reduced cost breakfast	154	53.9
Unable to receive free/reduced cost lunch	159	53.5
Resources to Educate At Home		
Used online or social media resources	314	77.1
Support from child(ren)'s school	315	71.3
Collaborated with other parents	315	22.5

Note: *n* reflects the total number of individuals who responded to the question. Only parents who were currently educating their child at home ($n = 315$) were asked the "resources to educate at home" items. Individuals who answered "not applicable" were not included in percentage calculation.

3.1.2. Multivariate results (Table 3)

Compared to non-depressed parents, parents who met the PHQ-8 criteria for probable major depression or major severe depression reported that they were less prepared to provide at-home education for their child(ren) (B = −0.16, 95% CI = [−0.29, −0.02], $p = .021$). In other words, compared to being a non-depressed parent, being a parent who met criteria for major depression was associated with a 0.16 standard deviation decrease in at-home education preparation score. Parents with mild or minimal anxiety did not differ from parents with moderate or severe anxiety in their preparation to conduct at-home education for their child(ren) (B = 0.06, 95% CI = [−0.07, 0.19], $p = .380$). Parenting stress was negatively associated with parents' at-home education preparation (B = −0.37, 95% CI = [−0.47, −0.27], $p < .001$)—in other words, a one standard deviation increase in parenting stress score was associated with a 0.37 standard deviation decrease in the at-home education preparation score. In addition to these parenting risk factors, the results indicated that parents' report of an employment change (i.e., job loss) in the past 2 weeks was not associated with parents' perceived preparation to provide at-home education in any of the models. In fact, it seems that parental mental health factors were the only statistically significant predictor of parents' perceived preparation to provide at-home education to their children during COVID-19. As a robustness check, we ran these models again, but only among parents who stated they were currently homeschooling their children ($n = 315$). Standardized coefficients and *p*-values were unchanged.

In analyses examining the predictors of child anxiety scores as measured early in the COVID-19 pandemic, non-depressed parents did not differ from depressed parents in reporting child anxiety scores (B = 0.10, 95% CI = [−0.01, 0.21], $p = .071$). Compared to parents with mild or minimal anxiety, parents with moderate or severe anxiety reported higher child anxiety scores (B = 0.17, 95% CI = [0.06, 0.28], $p = .002$)—in other words, being a parent with moderate or severe anxiety was associated with a 0.17 standard deviation increase in child anxiety scores. Parenting stress was positively associated with child anxiety (B = 0.40, 95% CI = [0.32, 0.48], $p < .001$)—in other words, a one standard deviation increase in parenting stress was associated with a 0.40 standard deviation increase in child anxiety scores. Parents' report of an employment change (i.e., job loss) in the past 2 weeks (B = 0.10, 95% CI = [0.02, 0.18], $p = .020$) and parental age (B = 0.11, 95% CI = [0.02, 0.19], $p = .012$) were associated with higher reported child anxiety scores. Additionally, compared to parents with a high school degree or less, parents with a bachelor's degree or higher (B = 0.21, 95% CI = [0.07, 0.35], $p = .003$) reported higher child anxiety scores.

3.2. Qualitative results

Results of content analyzing responses to four open-ended questions: 1) "Please tell us about other disruptions to your child's schedule because of the Coronavirus/COVID-19 global health crisis"; 2) "What

Table 3
Multivariate regression results of parental depression, parental anxiety, and parenting stress predicting parental preparation to home school and child anxiety (N = 405).

	Dependent Variable: Perceived Preparation to Educate at Home		Dependent Variable: Child Anxiety	
	B	95% CI	B	95% CI
Parental depression	−0.16*	[−0.29, −0.02]	0.10†	[−0.01, 0.21]
Parental anxiety	0.06	[−0.07, 0.19]	0.17**	[0.06, 0.28]
Parenting stress	−0.37***	[−0.47, −0.27]	0.40***	[0.32, 0.48]
Social distancing days	0.02	[−0.09, 0.13]	0.00	[−0.09, 0.09]
Lockdown days	−0.06	[−0.17, 0.05]	−0.02	[−0.11, 0.07]
Income	0.03	[−0.10, 0.15]	−0.07	[−0.17, 0.03]
Female	0.03	[−0.09, 0.14]	−0.02	[−0.11, 0.07]
Black	0.00	[−0.10, 0.11]	−0.02	[−0.10, 0.06]
Hispanic	0.06	[−0.03, 0.17]	−0.04	[−0.12, 0.04]
Other	0.04	[−0.07, 0.16]	−0.06	[−0.14, 0.03]
Cohabitating	−0.01	[−0.12, 0.09]	−0.06	[−0.14, 0.03]
Some college	−0.03	[−0.19, 0.13]	0.13†	[0.00, 0.25]
College plus	0.04	[−0.13, 0.22]	0.21**	[0.07, 0.35]
Employment changed	0.02	[−0.08, 0.12]	0.10*	[0.02, 0.18]
Age	0.03	[−0.08, 0.14]	0.11*	[0.02, 0.19]

Note: Coefficients are standardized. Parental depression is coded as (0 = *non-depressed*, 1 = *meets PHQ-8 criteria for probable major depression or severe major depression*). Parental anxiety is coded as (0 = *minimal or mild anxiety*, 1 = *meets GAD-7 criteria for probable moderate or severe anxiety*). Parenting stress is a continuous scale that ranged from 0 to 3.
†$p < .10$, *$p < .05$, **$p < .10$, ***$p < .001$.

online resources have been the most helpful in educating your child at home?"; 3) "How has your child(ren)'s behavior changed in the past 2 weeks, since the Coronavirus/COVID-19 global health crisis?"; and 4) "What do you think your child(ren) need during this global health crisis?" are presented in Tables 4, 5, 6, and 7, respectively. These responses were generated by the participant, and not all parents provided a response to the open-ended questions. A total of 226 survey participants answered question 1; 284 answered question 2; 126 answered question 3; 401 answered question 4.

With regard to daily schedule disruptions due to COVID-19, school and/or daycare closure and lack of physical activity emerged as the most consistent disruptions reported by parents (28.3%). This is consistent with the close-ended questions which showed that the majority of parents reported school closures. Another prominent disruption that parents noted was social isolation from generalized others and relatives (245.7% and 24.8%, respectively). Additionally, 7.5% of parents reported a disruption in their child's basic routine (e.g., changes to eating and sleeping patterns). Although reported relatively infrequently, it is worth noting that 4.0% of children experienced a schedule disruption due to an inability to obtain their usual special education resources, and 4.9% of parents reported cancelled doctor appointments as an important daily schedule disruption to their child.

With regard to the use of technology for child education during COVID-19, we asked parents to tell us about the online tools that they were using to support at-home educational activities. Programs such as ABC Mouse and Khan Academy ranked as the most commonly reported tools parents were using to support at-home education. Approximately 59.9% of responses to this question indicated some form of online educational tool. Furthermore, school-based technological resources were common, and 28.5% of participants generated a tool that was school-based. School-based tools were provided by the school, and were differentiated from standalone online tools such as ABC Mouse and Khan Academy (prior category) that were used to supplement classroom based activities but are not generated by the school setting. The school based programs included SeeSaw and Google Classroom, and school-based websites. About 26.1% of parents reported using social media (e.g., YouTube, Facebook mom groups) to supplement their child's at-home education. Only about 7.0% of parents reported utilizing live remote technological resources (e.g., Zoom, online meetings) to educate their children. About 7.4% of parents reported lack of use of online resources to educate their child at home or they included resources that the

Table 4
Analysis of open-ended question: Daily schedule disruptions experienced by family (n = 226).

Type of Disruption	Frequency (%)	Examples
School/Daycare Cancelled	28.3%	"None besides her school closure"
Lack of Physical Activity	28.3%	"Beaches and trails are closed", "spring sports are canceled"
Social Isolation from Generalized Others	25.7%	"She misses her playmates"
Social Isolation From Relatives	24.8%	"Can't visit grandparents"
Enrichment Cancelled	15.0%	"No dance class, no pottery class, no museums", "No church"
Entertainment Cancelled	10.6%	"Birthday party canceled", "We can't take her shopping"
Mental Health/Stress	10.2%	"They are restless inside… more fights between them", "Upset because they can't see their friends"
Basic Routine	7.5%	"Disrupted meal schedules"
Miscellaneous	7.5%	"Diapers, wipes and formula always sold out everywhere hard to find"
Sleep Pattern	4.9%	"His sleep pattern"
Childcare	4.9%	"I am trying to work while taking care of them"
Missing Doctor Appointments	4.9%	"Unable to receive procedure to place tubes in MB's ears due to non-emergency procedures being canceled", "Physical therapy"
Missing Special Education Resources	4.0%	"Delay in accessing speech therapy sessions", "Special education for my son with autism has been moved online"
No Difference (Child is Young)	1.8%	"My child is young and has not experienced any disruptions"
No Difference (Child Previously Homeschooled)	0.9%	"My kids are homeschooled. They have experienced no disruptions"

Note: *n* reflects the total number of individuals who responded to the question. Individuals who answered "not applicable" or left the response box blank (*n* = 179) were not included in percentage calculation. Total percent exceeds 100 because some participants gave more than one response to the question.

Table 5
Analysis of open-ended question: Use of technology for child education (n = 284).

Type of Technology	Frequency (%)	Examples
Online Educational Tools	59.9%	"ABC mouse", "Study Island", "Khan Academy", "Wikipedia", "PBS", "Prodigy", "Epic"
School-Based	28.5%	"The school has provided a website for lessons and homework", "SeeSaw", "Google classroom", "Resources provided by the course coordinator", "The schools app", "Teacher has mailed and emailed assignments I can work with my child"
Social Media	26.1%	"YouTube", "The mom groups on Facebook", "Pinterest"
Miscellaneous	7.4%	"I don't use online resources", "Amazon"
Live Remote	7.0%	"Online meetings with teacher", "Zoom meetings with tutors"
Paper-Based	5.3%	"Printing out worksheets from K5 learning website"

Note: *n* reflects the total number of individuals who responded to the question. Individuals who answered "not applicable" or left the response box blank (*n* = 121) were not included in percentage calculation. Total percent exceeds 100 because some participants gave more than one response to the question.

Table 6
Analysis of open-ended question: Parents' perceived changes in child behavior (n = 126).

Type of Behavior Change	Frequency (%)	Examples
Externalizing Problems	48.4%	"Whinier", "Bickering has become an everyday ordeal", "More restless and get easily agitated"
Anxious Symptoms (Internalizing Problems)	27.8%	"Worries more", "Anxious", "Afraid and hesitant to leave the house", "Stressed"
Depressive Symptoms (Internalizing Problems)	18.3%	"Less energetic", "Sad", "Depressed", "Sleeps a lot", "Less desire to interact with peers", "Lonely", "Cries a lot"
Bored	15.1%	"Bored", "They aren't as motivated as usual", "Often complain of being bored"
Positive	7.9%	"More thankful and helpful", "Hasn't been as cranky", "More excited to spend time with the family", "More relaxed"
Miscellaneous	7.9%	"I don't use online resources", "Amazon"

Note: *n* reflects the total number of individuals who responded to the question. Of the total sample, 140 parents indicated that they had observed change in their child's behavior and were prompted to answer this question. Individuals who answered "not applicable" or left the response box blank ($n = 14$) were not included in percentage calculation. Total percent exceeds 100 because some participants gave more than one response to the question.

Table 7
Analysis of open-ended question: What children need (n = 401).

Type of Need	Frequency (%)	Examples
General Emotional Needs	50.1%	"Love", "Support", "Attention"
Socialization	14.0%	"Friends to communicate with", "Socialize with kids their own age", "A way to interact with another child"
Entertainment	12.7%	"Convenient access to pastime that isn't on a screen", "New and interesting ways of being entertained", "Things to keep them busy"
Physical Activity	10.7%	"Play outside with other kids", "Better kid workout videos", "Better weather so we can be outside", "More exercise"
School	9.7%	"To go back to school", "More formal education", "Better schooling resources", "More educational engagement"
Feel Safe/Protected	9.2%	"Reassured that they will be safe", "Clarity and plan from trustworthy adults", "Understand as long as they do the right thing they will be ok"
Basic Needs	7.7%	"Food and toiletries", "Cleaning supplies", "Housing", "Money"
Share COVID-19 Guidance	7.2%	"Lots of safety and precautions", "Take responsibility for themselves", "Someone to clarify the situation", "Guidance"
Parental Stability/ Security	6.5%	"Good parenting", "Her parents to be even-tempered", "For us to be as calm and rational as possible", "Security from parents"
Miscellaneous	6.2%	"Alone time", "Wake up from day dreaming and the usual grind"
Withhold COVID-19 Guidance	3.0%	"They need to not be told about this because it would terrify them unnecessarily", "They need the restrictions to be lifted… the flu kills more"

Note: *n* reflects the total number of individuals who responded to the question. Individuals who answered "not applicable" or left the response box blank ($n = 4$) were not included in percentage calculation. Total percent exceeds 100 because some participants gave more than one response to the question.

researchers determined were outside of other coding categories, such as amazon.com.

With regard to parents' perceived changes in child behavior during COVID-19, increased externalizing problems was the most common behavior change reported by parents (48.4%). Following externalizing problems, parents reported increased internalizing problems, namely, anxious and depressive symptoms (27.8% and 18.3%, respectively). Additionally, 15.1% of parents reported their child becoming bored during COVID-19. Interestingly, although reported relatively infrequently, 7.9% of parents reported observing a positive change in their child's behavior (e.g., expressing gratitude, feeling more relaxed) during the pandemic.

In the context of the COVID-19 pandemic, we asked parents to tell us what they think their children need. The majority of parents (50.1%) reported that during the pandemic children needed general emotional support, such as love, care, and attention. Socialization (14.0%), entertainment (12.7%), and physical activity (10.7%), were indicated as important needs of children by participants. Approximately 9.7% reported that during the COVID-19 global health crisis, students needed access to education, including going back to school and having access to better educational resources at home. 9.2% emphasized the need for children to feel safe and protected. Furthermore, 7.7% of parents that responded reported that their children needed access to basic needs, such as toilet paper, food, and housing. Only about 7.2% reported that they felt that their children needed guidance and information about COVID-19 during the pandemic. Parental stability/security referenced the specific needs of children from their parents, and were differentiated from general emotional needs. About 6.5% of parents specifically indicated that children needed support from their parents (e.g., security from parents, even-tempered parenting). Finally, a small portion (3.0%) indicated that children needed to not be told about COVID-19 (e.g., to avoid scaring children).

4. Discussion

This study provides a snapshot in time of how families with young children were adapting to the COVID-19 in the early days of the pandemic (i.e., April 2020). The results suggest that parents were engaging in higher levels of nearly all direct child caregiving activities during COVID-19, such as playing more often, reading more often, and watching TV more often with their children. Given the ramifications of social distancing measures and school closures due to COVID-19, it is perhaps not surprising that parents were more involved in everyday caregiving activities during this time. Notably, 53.6% of parents said they were hugging and showing physical affection toward their child more often during COVID-19. The increase in everyday caregiving activities occurs in the context of numerous stressors. For example, 1 in 4 parents reported an employment change related to COVID-19. Over half of the parents who said they received free and reduced cost school meals indicated that lack of access to this resource was a disruption to their daily life.

This study documents high levels of parental depression, parental anxiety, and parenting stress (APA, 2020; Patrick et al., 2020). Two out of every five parents (40.0%) met the PHQ-8 criteria for probable major depression or severe major depression. Similarly, 39.9% met the GAD-7 criteria for moderate or severe anxiety. Though the rates of anxiety and depression among this sample of parents of young children were high, they were consistent with the Census Bureau's Household Pulse Survey. The nationally representative Household Pulse Survey indicated that during April 23 - May 5, 2020, about 31% of American adults had symptoms of anxiety disorder; 23.5% had symptoms of depressive disorder; and about 36% had symptoms of anxiety or depressive disorder (CDC, 2020; U.S. Census Bureau, 2020). The rates in the current study as well as those reported by the Household Pulse Survey are more than double those shown prior to COVID-19. During January to June 2019, 8.2% of adults had symptoms of anxiety disorder; 6.6% had symptoms of

depressive disorder; and 11.0% had symptoms of anxiety disorder or depressive disorder (National Center for Homeless Education, 2020; Fowers & Wan, 2020). The high rates of parental mental health problems are also consistent with recent research showing that parents are experiencing more stress and declines in mental health during the pandemic (APA, 2020; Patrick et al., 2020). There is reason to be concerned about the mental health of American parents (Brooks et al., 2020; Panchal et al., 2020), with the results of this study suggesting an alarmingly high rate of anxiety and depression among parents.

At the point this survey was administered, in April 2020, 97% of parents reported that public schools were closed, and a majority of parents (78%) were educating their child(ren) at home. The apparent disconnect between the report of school closures (97%) and parents saying they were educating their children at home (78%) can be explained by several factors. Some parents may have been relying on the child's other parent or another caregiver to provide at-home education; thus, they themselves were not providing the education and responded "no" to this question. In addition, some parents may not have been able to provide at-home education to their children, due to work and other responsibilities. Another potential explanation is that, although most parents (71.3%) felt supported by their child's school to provide at-home education, those that did *not* feel supported or well prepared may have been less likely to engage in at-home education with their child. Nonetheless, the gap between school closures and parents' report of at-home education is notable, and may be an area for concern as continuing school closures or partial at-home education seems likely to continue in many geographical areas for the 2020–2021 school year. Further research is needed to understand how schools can support parents to deliver or support at-home education.

Multivariate analysis indicated that parental depression and parenting stress were significantly negatively associated with parents' perceived preparation to provide at-home education. It may be that the stresses experienced during the pandemic interfered with some parents' ability to educate their children at home. Because our data are cross-sectional, it is also important to note the possibility that parents who felt more prepared to provide at-home education may have had better mental health in the wake of school closures. In other words, we cannot determine the direction of the association between parents' mental health and at-home education.

Over one-third of the parents in this study said that their child(ren) were experiencing behavior changes since the pandemic. In content coding of open-ended questions, parents reported that their children were lonely, sad, and afraid. Multivariate analysis indicated that parental mental health – specifically, parental anxiety and parenting stress – were associated with higher levels of child anxiety. Parental employment changes were also linked to higher levels of child anxiety. To date, there is little empirical data on how children are faring during COVID-19. There may be reason to be concerned about increases in harsh parenting and child maltreatment during the pandemic (Herd et al., 2020), among both mothers and fathers of young children (Lee, 2013; Lee, Kim, Taylor, & Perron, 2011). These results may suggest that, like their parents, children are suffering from anxiety that is associated with the disruptions to life from the pandemic. However, it is important to note that we do not have a baseline measure of child anxiety, and thus cannot infer that child anxiety levels have increased because of COVID-19. Future research is needed to document whether children's anxiety increased as a result of the pandemic.

4.1. Implications for supporting parents and children during the transition back to school

Prior to COVID-19, homeschooling was relatively rare, and there is little data on how socioeconomically disadvantaged children, children without access to the internet, abused and neglected children, or children with learning disabilities or other developmental delays may fare during a widespread national shift to at-home education or parents supplementing online/hybrid education. A limitation of the current study is that it does not encompass the experiences of marginalized children. Children who faced disadvantages prior to COVID-19 are going to be disproportionately impacted by lack of access to education and schooling (United Nations Children's Fund, 2020b). One vulnerable group is children with physical and learning disabilities. Millions of children in the U.S. have special needs and are reliant on services provided by individualized education programs (National Center for Education Statistics, 2020). Disruptions to routines, as well as lack of access to school-provided therapists and educational activities, may result in frustration and acting out behaviors (Lee, 2020). It is critical to address solutions to provide services to children with special needs. This may include telehealth-based interventions or other strategies (Frederick, Raabe, Rogers, & Pizzica, 2020; Hinton, Sheffield, Sanders, & Sofronoff, 2017).

Research on the effects of the COVID-19 disease has demonstrated that the impacts of COVID-19 have disproportionately impacted communities of color, socioeconomically disadvantaged individuals, as well as those with underlying health conditions and others who faced health inequalities before COVID-19. It is clear that the impacts of COVID-19 have been exacerbated by underlying socioeconomic and racial inequalities in the U.S. (Ebor, Loeb, & Trejo, 2020; Fortuna, Tolou-Shams, Robles-Ramamurthy, & Porsche, 2020). Children in socioeconomically disadvantaged contexts are also likely to be disproportionately impacted by lack of access to in-person education, and special attention should be given to programs to support their educational and mental health needs.

In addition, at least 1.5 million American children are homeless (National Center for Homeless Education, 2020) and homelessness is associated with lower educational outcomes for children (Manfra, 2019). There are 146,000 child victims of maltreatment who are in foster care in the U.S. (U.S. Department of Health and Human Services, 2020), and research shows children in foster care have poorer educational outcomes when compared to other children (Morton, 2015; Zetlin, Weinberg, & Kimm, 2004). Abused and neglected children are particularly vulnerable, given that they have already been traumatized by maltreatment. Lack of access to caring adults such as school personnel, who can check on their welfare and provide support, as well as lack of access to much-needed resources, such as school meals, are especially problematic for these youth (Herd et al., 2020). Further research is needed to better understand the experiences of at-home education and online education among parents and children who are homeless, in foster care, or who face other barriers to equal educational access (Herd et al., 2020).

Most schools do not offer mental health treatment services, and rely on teachers and non-clinical staff to support children's mental health (Fulks & Stratford, 2020). Trauma-based interventions to help children cope with the aftereffects of COVID-19 may be especially effective when students return to in-person school activities. Trauma-based care in schools have been shown to be effective to support students' wellbeing. The best evidence for whole-school or classroom approaches delivered by teachers or non-clinical school staff. One promising approach is training school staff on the use of trauma-informed approaches that are implemented in a way that is specific to the unique needs of marginalized youth (Stratford et al., 2020).

Another promising model to support children during the closure of in-person education is the youthCONNECT program model, which is a partnership of youth-serving organizations that supported students during the pandemic (Sacks & Jones, 2020). Community-based organizations may be able to provide children with meaningful connections to caring adults during a time of crisis. Furthermore, linkages with community-based organizations may help parents and youth connect to resources to address issues such as food insecurity and mental health needs.

4.2. Study limitations

This study speaks to the experiences of mostly White (70%), middle-income parents. Minority parents were underrepresented in the sample. The data were collected using a convenience sampling approach, thus, the study results are not nationally representative and are not generalizable to all parents in the U.S. All study analyses reported herein are cross-sectional in nature. We cannot infer causality in the results, nor can we conclusively determine whether the patterns of associations documented in this study are the result of COVID-19. For example, we do not have baseline measures of child anxiety; thus, it is not possible to determine whether the child anxiety levels found in this study reflect an increase in child anxiety due to the pandemic. All measures in this study were reported by parents; thus, all the study results are parents' perceptions. We do not have data from third parties to verify or validate study results. All of the study results should be interpreted with these caveats in mind.

4.3. Conclusion

The current study provides a one-time snapshot of parent and child wellbeing during the COVID-19 pandemic, focusing on how families adjusted to in-person education closures and shifted to at-home educational options. Parents were engaged in more everyday activities with their child and most parents were hugging and showing physical affection more often, even while 1 in 4 parents were affected by changes to employment. Parents reported high levels of daily schedule disruptions, as well as stressors such as lack of access to free and reduced price school meals. High levels of parental depression and parenting stress have implications for parents' perceived ability to provide at-home education. As the pandemic continues into the 2020–2021 school year, parents and children are in need of more mental health intervention to reduce mental health problems, as well as assistance in carrying out at-home educational activities. Innovative solutions that utilize telehealth as well as partnerships with community-based organizations may help to meet these challenges.

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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