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Short-term impacts of COVID-19 on family caregivers: Emotion regulation, coping, and mental health

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Abstract

Background: The negative mental health impact of coronavirus disease 2019-related stressors may be heightened for those caring for children, who bear responsibility for their welfare during disasters.

Aim: Based on the Transactional Model of Stress and Coping, we inquired whether caregivers' emotion regulation and coping behavior were associated with posttraumatic stress symptoms (PTSS).

Materials & Methods: Data were collected through a national online survey in April 2020, and again 60 days later.

Results: Of the 801 longitudinal cases, 176 (63.6% female; mean age = 33.5) reported caring for minors in their homes during the pandemic. Over 20% of caregivers experienced clinically concerning PTSS, rates higher than their non-caregiving counterparts. Regression analysis indicates caregivers' baseline mental health symptoms and emotion regulation predicted PTSS 60 days later.

Discussion: Implications for needed parenting supports among families experiencing traumatic stress are provided.

Conclusion: Anxiety symptoms at baseline were the most significant and consistent contributor to all models and were significantly higher among those with clinically concerning levels of PTSS suggesting a clear intervention target.

1 | INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic arrived in the United States early in 2020 and abruptly and dramatically altered the daily routines of families nationwide. COVID-related stressors included fears of infection, disruptions to work/learning and daily self-care routines, financial loss, lack of access to reliable information and resources, and in some cases, stigma (Brooks et al., 2020; Cluver et al., 2020; Pew Research Center, 2020). Psychological distress due to COVID-19 reached moderate to severe levels around the world (e.g., Rodriquez-Rey et al., 2020; Wang et al., 2020), with evidence that women were particularly vulnerable (Blekas et al., 2020; Lopes & Jaspal, 2020; Ruiz-Frutos et al., 2020). As with all segments of the population, responses to stressors for caregivers include increased stress, anxiety, and depression (e.g., Bolt et al., 2018; Labarda et al., 2020; Seto et al., 2019). Attempts to cope with this distress have well-documented implications for long-term mental health difficulties, including posttraumatic stress disorder (PTSD; Kerns et al., 2014; Maeda & Oe, 2017; North, 2016). Compared with their noncaregiving counterparts, caregivers repoort more acute negative disaster responses (Russell et al., 2020; Fussell & Lowe, 2014), resulting from additional caregiving burdens, which may heighten anxiety and posttraumatic stress (Kerns et al., 2014; Maeda & Oe, 2017).

1.1 | Caregiving during COVID-19

Periods of uncertainty, anxiety, and changes in routine with an indeterminant endpoint, which characterized the quarantines enacted during the spread of COVID-19, are stressful (Carleton, 2016; Sweeny, 2018) and may be particularly salient for families with children who live at home (Brooks et al., 2020; Cluver et al., 2020; Ellis & Hudson, 2010). Parents have additional decisions to make about how best to protect and care for their children during a crisis, which may underpin differences in their coping behaviors compared with noncaregivers.

Maintaining stable, predictable daily routines is key for maintaining mental health during community-wide disasters, particularly for families caring for children (Wisner et al., 2018). Unfortunately, the protective features of quotidian family life were disrupted during the pandemic by coordinated efforts to enact social distancing practices to prevent the spread of the disease (Galea et al., 2020; Yoon et al., 2015). Novel health guidelines for social distancing placed new burdens on parents to teach their children how to wear face coverings and keep their distance from sorely missed friends, while adding new routines for work and support for their children's education from home. These adjustments occurred when parents had less access to the supports often used to manage stress and role strain (Pew, 2020), including religious, community and health centers, schools, and other social networks.

Even outside of a pandemic context, caregivers are at risk of stress saturation and burnout (Maslach et al., 2001). Caregiver burden includes both objective and subjective strains that may be experienced differentially by men and women (Christie et al., 2019; Craig & Mullan, 2010; van Ee et al., 2016). While historically far more women report adopting culturally supported roles as family caregivers, men's accounts of the burdens felt when in similar roles are less frequently studied (McGill, 2014). Evidence of gender effects on caregiver distress during the COVID-19 pandemic indicates mixed results (Russell et al., 2020; Wade et al., 2021).

1.2 | The transactional stress and coping model

To better understand how individuals caring for children fared during this early stage of the pandemic, we used the transactional model of stress and coping (Lazarus & Folkman, 1984). According to this model, individuals' levels of

distress are a function of their potentially stressful circumstances interacting with their subjective appraisals of those circumstances and their specific response to them. Appraisals involve estimating the extent to which a given circumstance is threatening or likely to cause harm; thus, not only are exposures to stressors predictive of resultant distress but so too are individuals' appraisals of the stressfulness of those exposures. Further, individuals' responses to stressors (i.e., their coping) also determine the degree of their distress. Generally, using active coping to directly address problems is more adaptive than more avoidant strategies such as behaviorally disengaging (e.g., distraction) or consuming alcohol or other drugs (see Aldwin, 2007, for a review). Previous work in disasters has demonstrated that active coping is related to better mental health and avoidance coping is related to poorer mental health (Baral & Bhagawati, 2019; Park et al., 2012). Further, individuals with pre-existing emotion regulation difficulties may be at elevated risk of increased distress in a crisis due to the poor coping in which they often engage (Aldao et al., 2010; DeYoung & Rueter, 2016; Maslach et al., 2001).

1.3 | Current study

The current study examined longitudinal patterns of caregivers' mental health from a national sample recruited in the first weeks of the US COVID-19 pandemic (April, 2020). Informed by the transactional stress and coping model, where mental health is an outcome of coping behavior (Lazarus & Folkman, 1984), we posit that effective coping with perceived stress is protective of mental health and protects against posttraumatic stress symptoms. Our research questions center on the potential linkages between coping and mental health indicators over a 60-day period time immediately following the first peak of COVID-19 infections during mid-April in the United States and spanning through the approximate end of the 2020 school year in June. This timing has particular salience for the caregivers surveyed, as the assessment time points used in this analysis took place within the first few weeks after widespread school closures and shifts to distanced learning based in families' homes, and 60 days later when the American school year had drawn to a close, but no consistent information across municipalities was available for what the upcoming 2021 school year would bring.

We include a measure of increasing/decreasing stability in the 7-day average of new cases by the state during both data collection time points (Dong et al., 2020) to account for geographic variation in disease burden and associated stressors in various regions of the United States. Our research questions ask: (1) Given high levels of stress and potential caregiver burnout noted during similar crises, do caregivers report different mental health, stress appraisals, and coping experiences compared to their noncaregiver counterparts? We hypothesize that relative to their noncaregiver counterparts, caregivers will report higher stress appraisals, more mental health symptoms, and more frequent use of active coping strategies to reduce these negative experiences. (2) How do caregivers' stress appraisals, mental health indicators, and coping behavior relate to PTSS 60 days later? To address this question, we explore predictors of caregivers' PTSS from baseline mental health, coping behavior, and emotion regulation factors. Based on previous literature we would hypothesize that baseline mental health struggles and difficulty regulating emotions would predict more PTSS, whereas active coping would protect against PTSS.

2 | METHODS

Data presented here include longitudinal results over a 60-day period. Baseline data were collected between April 7 and 14, 2020,—during the first 7-day average peak of new COVID-19 cases in the United States (Dong et al., 2020)—and approximately 3 weeks after the first widespread school closures and quarantines were enacted. Follow-up data were collected 60 days later at the end of June, after the end of the school year across school type and location. The spacing of these data collection timepoints allows ample time to assess posttraumatic stress with a focus on exploring

the early trajectories that could inform future prevention efforts to intervene and support those vulnerable subgroups.

2.1 | Participants

Individuals 18 years or older living in the United States and English-speaking were eligible to participate through Amazon's Mechanical Turk (MTurk) online worker platform. Compared to other online participant forums, MTurk workers are more diverse and provide a valuable approximation of health-related indicators for larger populations including the United States (Bartneck et al., 2015; Sheehan & Pittman, 2016). Eight hundred and one participants provided complete data at both time points, of whom 176 (63.6% female; mean age = 33.5) were caregivers with children younger than 18 living in their home. See Table 1 for details.

2.2 | Measures

2.2.1 | Demographic and background characteristics

Participants reported at baseline on their employment status, financial security ("Do you have enough money to meet your needs," rated from 1 to 5 ["not at all" to "completely"]), whether they were a primary caregiver for a child younger than 18, partner status (partnered = married or cohabiting with a significant other and nonpartnered = single, divorced or widowed), gender, sexual orientation, race, ethnicity, and age. Additionally, each respondent provided their location by state, which allows analysis to account for average state-level COVID-19 burden levels during the follow-up data collection period as described below.

2.2.2 | COVID-19-specific stressors

Based on previous work during SARS and the early months of the COVID-19 pandemic (Brooks et al., 2020; Main, et al., 2011; Qiu et al., 2020), we created a novel measure of COVID-19 stressors to be completed at all timepoints (Park et al., 2020). This measure assesses whether individuals experienced each of 23 stressors in the past week via dichotomous Y/N response; for each stressor experienced, participants rated its perceived stressfulness on a scale of 1–5 ("not at all stressful" to "extremely stressful"). Stressors are conceptually grouped into infection-related stressors, daily activity-related stressors, and financial/resource-related stressors, thus total appraisal scores for each type of stressor are the sum of stress ratings for each group of endorsed items, respectively. Baseline data are included in the current study as a predictor. Preliminary psychometric indicators for the measure are strong, as the scale is unidimentional and highly internally consistent (reported Cronbach's alpha = .98, and .98 n the current sample) with good convergent validity with well-established stressor scales (Tambling et al., 2021).

2.2.3 | State-level COVID-19 burden stability

The research questions at hand concern the impacts of COVID-19 and associated stressors on mental health outcomes over a 2-month period. Thus, it was prudent to include a measure of rates of COVID-19 diagnosis by the state to account for the wide range of disease burden and related stressors experienced in different geographic areas at the time mental health outcomes were assessed. The 60-day follow-up survey was collected from June 29 to July 12, 2020. We calculated COVID-19 burden stability using the daily reports published by the Johns Hopkins

TABLE 1 Demographic descriptive characteristics: Caregivers versus noncaregivers

	Caregiver (n = 176)	Noncaregiver (n = 625)
	μ (SD)	
Age	33.5 (11.7; 20–76)	35.8 (13.3; 18–78)
	N (%)	
Gender*		
Male	65 (35.3%)	306 (46.5%)
Female	117 (63.6%)	339 (51.5%)
Race		
Black/African American	18 (9.8%)	92 (14.0%)
Asian/Asian American	18 (9.8%)	95 (14.4%)
Native Hawaiian/other Pacific Islander	8 (4.3%)	38 (5.8%)
American Indian/Alaska Native	9 (4.9%)	49 (7.4%)
White	157 (85.3%)	521 (79.2%)
Ethnicity		
Hispanic	13 (7.1%)	50 (7.6%)
Non-Hispanic	171 (92.9%)	608 (92.4%)
Geographic state*		
West	38 (20.7%)	149 (22.6%)
Midwest	49 (26.6%)	110 (16.7%)
South	65 (35.3%)	258 (39.2%)
Northeast	31 (16.8%)	140 (21.3%)
Relationship status*		
Partnered	137 (74.5%)	317 (48.2%)
Nonpartnered	47 (25.5%)	341 (51.8%)
Current student status		
No	139 (75.5%)	508 (77.2%)
Yes, part-time	14 (7.6%)	45 (6.8%)
Yes, full-time	23 (12.5%)	73 (11.1%)
Before COVID-19 employment status		
No	27 (14.7%)	114 (17.3%)
Yes, part-time	32 (17.4%)	123 (18.7%)
Yes, full-time	125 (67.9%)	421 (64.0%)
Current employment status		
No	44 (23.9%)	190 (28.9%)
Yes, part-time	37 (20.1%)	115 (17.5%)

(Continues)

TABLE 1 (Continued)

	Caregiver (n = 176)	Noncaregiver (n = 625)
Yes, full-time	103 (56.0%)	353 (53.6%)
Monetary status to meet needs		
Not met	79 (42.9%)	315 (47.9%)
Met	105 (57.1%)	343 (52.1%)

Abbreviations: COVID-19, coronavirus disease 2019; SD, standard deviation.

*Significant differences between caregiver and noncaregiver groups.

Center for Systems Science and Engineering (Dong et al., 2020) where 7-day averages for new COVID-19 diagnosis are reported by the state on a 6-point scale (from 1 = −100% to 6 = +100%) relative to the previous 2-week period. To minimize the reporting error from common cause variation (Perla et al., 2020), we computed an average for the present study, calculating a mean from data on 5 days during the data collection window, spaced approximately 4 days apart. State-level COVID-19 burden stability levels were dummy coded as either 0 (states reporting decreases in COIVD diagnoses −100%, −50%, or −5% compared with the 2 weeks prior) or 1 (states reporting increases of +5%, +50%, or +100% relative to the 2 weeks prior).

2.2.4 | Mental health symptoms

The Depression Anxiety Stress Scale-21 (DASS-21; Henry & Crawford, 2005) comprises three 7-item subscales to assess depression, anxiety, and stress. The measure was completed at both timepoints and uses a 4-point Likert scale from 0 to 3 ("did not apply to me at all" to "applied to me very much or most of the time"). Baseline data are included in the current study. Subscales are summed and doubled to match DASS-42 norms; higher scores indicate greater distress. Reliability in the current sample was excellent for all three subscales (α = .93, .90, and .90, for depression, anxiety, and stress, respectively).

2.2.5 | Emotion dysregulation

Participants reported their trait-like emotion dysregulation at baseline on the 18-item Difficulties with Emotion Regulation Scales—short form (DERS-SF; Kaufman et al., 2016), which uses a 5-point Likert scale ("Almost never" to "Almost always"). Using a clinical-contextual framework for the longer original measure, Gratz and Roemer (2004) identified six distinct factors that describe trait-like emotion regulation difficulties: (a) lack of emotional awareness; (b) lack of emotional clarity; (c) difficulty regulating behavior when distressed (e.g., impulsivity); (d) difficulty engaging in goal-directed cognition and behavior when distressed; (e) unwillingness to accept certain emotional responses; and (f) lack of access to strategies for feeling better when distressed. Reliability of these six abbreviated 3-item scales, used as predictors in the current sample, was adequate (α range = .75–.88).

2.2.6 | Coping

Subscales from the Brief Coping Orientation to Problems Experienced (COPE) (Carver, 1997) assessed the situational use of active and avoidant coping strategies at both timepoints by assessing active coping with two items and avoidant coping through six items assessing behavioral disengagement and substance use. Each item used a 4-point

Likert scale ranging from 1 to 4 ("I haven't been doing this at all" to "I've been doing this a lot") to capture how individuals had coped with "COVID-19 related stressors" over the past week. Baseline data are included as a predictor in the current study. Given guidelines to include a minimum of three indicators to produce an interpretable latent construct or scale (Kline, 2011), Cronbach's alpha has limited utility for these coping subscales and is not reported here.

2.2.7 | Posttraumatic stress symptoms

Participants reported their posttraumatic stress symptoms at the 60-day follow-up timepoint using the 22-item Impact of Events Scale-Revised (IES-R; Weiss & Marmar, 1997). The scale consists of three subscales of Intrusion (8 items), avoidance (8 items), and hyperarousal (6 items) scored on a 5-point Likert scale (0 "Not at all" to 4 "Extremely"). Subscales are averaged and total scores are summed, with higher scores indicating increased difficulty following stressful events. Validated cutoff scores for probable PTSD diagnoses use the summed total score, with scores above 33 indicating probable PTSD (Creamer et al., 2003). Reported Cronbach's alphas in the current sample are acceptable (α = .92, .86, and .86 for the intrusion, avoidance, and hyperarousal subscales, respectively).

2.3 | Procedures

The study was classified as exempt from review by the University of Connecticut IRB (IRB X20-0057) before recruiting participants from Amazon's MTurk online worker pool for participation in a longitudinal, anonymous study of coping and risk behavior during COVID-19. Evaluations of MTurk for health research have found data to be replicable and valid and underscore the utility of this platform for health-related studies (Mortensen & Hughes, 2018). MTurk participants who reviewed the study description followed the survey link to provide consent, then completed the study's survey expected to take 20 min. Participants received a $2 incentive upon completion of the baseline survey and $3 for each follow-up survey; baseline and 60-day follow-up results are presented here.

Best practices for online survey data management include filtering out cases of subjective inattentiveness, such as abnormally quick response times (Kees et al., 2017; Sheehan, 2018). Given concerns about crowd-sourced convenience samples (Chandler & Shapiro, 2016), rigorous data management practices were followed to verify the inclusion of unique individual human respondent cases (as opposed to computerized bot responses) and the attentiveness of each response. First, we screened the data set for duplicate cases and global positioning verification within the United States, deleting 65 repeat cases. Next, responses completed in under 10 min (n = 169; <50% the pilot estimates for expected survey length) were deleted. A final Captcha attention screen and an attention check item were also included in the 60-day follow-up survey.

2.4 | Analysis

The final sample with complete baseline and 60-day follow-up measures includes 801 cases, 176 of whom (22.0%) reported being a caregiver of a child younger than 18 in their homes. In line with our first research question and its associated hypothesis, univariate analyses (mean/median, standard deviation, and frequency) and bivariate analyses (independent samples t-test, bivariate correlation) are reported. Multivariate linear regressions examined our second, exploratory question to identify significant baseline predictors of caregivers' posttraumatic stress symptoms 60 days later (intrusion, avoidance, and hyperarousal separately, in line with other COVID-19-specific studies of posttraumatic stress; Rodriquez-Rey et al., 2020).

3 | RESULTS

Table 1 reports participant demographics in full for caregivers and non-caregivers who provided complete data at baseline and the 60-day follow-up; both groups were roughly comparably represented across age and race/ethnicity. Differences were noted between these groups based on gender ($n = 117$ women, 63.6% of caregivers compared with $n = 339$, 51.5% of noncaregivers), partner status ($n = 137$, 74.5% of caregivers were partnered/married compared with $n = 317$, 48.2% of noncaregivers), and geographic region (the greatest proportion of caregivers by region were located in the South, 35.3% of respondents from the region, compared with only 16.8% of respondents from the Northeast).

To address our first research question and discern whether caregivers reported different experiences than their noncaregiver peers during the peak of the pandemic and 60 days later, t-tests of independent group differences in emotion dysregulation, mental health symptoms, stress appraisals, coping, and PTSS were conducted. Several statistically significant group differences support our hypotheses: caregivers reported significantly higher use of active coping ($t = 2.26$, $p < .05$, $d = 0.18$), infection-related stress appraisals ($t = 2.53$, $p < .01$, $d = 0.23$), daily activity-related stress appraisals ($t = 4.95$, $p < .01$, $d = 0.44$), and finance-related stress appraisals ($t = 2.09$, $p < .05$, $d = 0.19$) at baseline. Contrary to expectations, noncaregivers reported significantly higher rates of baseline depression symptoms ($t = -2.06$, $p < .05$, $d = 0.16$). Caregivers from states with decreasing COVID-19 burden reported significantly higher rates of daily activity-related stress appraisals ($t = 2.53$, $p < .01$, $d = 0.22$) at baseline compared to their noncaregiving counterparts.

3.1 | Bivariate correlations of study variables with caregivers' PTSS at 60 days

Intrusion distress at 60 days was significantly positively correlated with all three types of baseline stress appraisals, each coping strategy (behavioral disengagement, substance use, and active coping), and all indices of mental health and emotion dysregulation: DERS-SF subscales of clarity, goals, impulse, nonacceptance, and strategies in addition to depression, anxiety and stress (rs from 0.23 to 0.60, all $p < .01$; DERS-SF awareness $r = -0.01$, $p = ns$). Similarly, avoidance distress at 60 days was significantly positively associated with all types of baseline COVID-19-related stressors, each coping strategy, and all but one index of mental health and emotion dysregulation: DERS-SF subscales of clarity, goals, impulse, nonacceptance, and strategies (awareness $r = .04$, $p = ns$) in addition to depression, anxiety, and stress (rs from 0.17 to 0.50, all $p < .05$). Finally, hyperarousal distress results followed the same pattern. Significant, positive associations are noted between hyperarousal at 60 days and all types of baseline COVID-19-related stressors, and all but one indices of mental health and emotion dysregulation (DERS-SF awareness $r = .07$, $p = ns$), but only 2 of the 3 coping strategies: behavioral disengagement and substance use coping strategies (rs from 0.32 to 0.61, all $p < .01$; COPE active $r = .12$, $p = ns$). See Table 2 for details.

3.2 | Caregiver multivariate models

Multivariate linear regression models were constructed to predict caregivers' psychological distress (intrusion, avoidance, and hyperarousal symptoms of PTSS) at 60 days, controlling for demographic characteristics (gender, age, partner status, and whether needs were met or not), then entering predictors (COVID-19-specific stressors, COVID-19 burden stability, mental health, emotion regulation, and coping) in using stepwise regressions with forward entry methods. Predictors of intrusion symptoms (see Table 3) explained 51.3% of the variance (Adj. $R^2 = 0.513$, $F(8, 130) = 19.16$, $p < .01$) such that being in a partnered relationship ($\beta = .16$, $p < .05$), as well as experiencing higher depression ($\beta = .25$, $p < .05$) and anxiety symptoms ($\beta = .25$, $p < .01$), activity-related stress appraisals ($\beta = .27$, $p < .01$) and impulsive emotion dysregulation ($\beta = .19$, $p < .01$) significantly positively predicted

TABLE 2 Bivariate correlations among variables of interest

| Variables | Caregivers (n = 176) | | |
	IES Intrusion	IES Avoidance	IES Hyperarousal
IES intrusion	–		
IES avoidance	.74**	–	
IES hyperarousal	.90**	.73**	–
COPE behavioral disengagement	.47**	.45**	.47**
COPE substance use	.36**	.38**	.35**
COPE active	.23**	.17*	.12
DERS awareness	−.01	.04	.07
DERS clarity	.31**	.37**	.32**
DERS goals	.42**	.41**	.46**
DERS impulse	.52**	.48**	.55**
DERS nonacceptance	.42**	.44**	.47**
DERS strategies	.45**	.42**	.47**
DASS depression	.60**	.45**	.61**
DASS anxiety	.56**	.50**	.57**
DASS stress	.55**	.47**	.60**
Financial stress appraisal	.35**	.37**	.34**
Infection stress appraisal	.41**	.30**	.39**
Activity stress appraisal	.51**	.40**	.42**

Note: IES Intrusion, Avoidance, and Hyperarousal distress were measured at 60 days.

Abbreviations: COPE, Coping Orientation to Problems Experienced; DASS, Depression Anxiety Stress Scale-21; DERS, Difficulties with Emotion Regulation Scales; IES, Impact of Events Scale.

*p < .05; **p < .01.

intrusion distress. Predictors of avoidance symptoms explained 35.8% of the variance (Adj. $R^2 = 0.358$, $F(7, 134) = 12.23$, $p < .01$) such that holding constant all other covariates, higher nonacceptance emotion dysregulation ($\beta = .33$, $p < .01$), anxiety symptomology $\beta = .28$, $p < .01$) and finance-related stress appraisals ($\beta = .23$, $p < .01$) significantly positively predicted avoidance distress. Predictors of hyperarousal psychological distress explained 50.8% of the variance (Adj. $R^2 = 0.508$, $F(8, 131) = 18.97$, $p < .01$) such that holding constant all other covariates, higher depression ($\beta = .22$, $p < .05$) and anxiety symptomology ($\beta = .27$, $p < .01$), impulse control emotion dysregulation ($\beta = .26$, $p < .01$) and infection-related stress appraisals ($\beta = .16$, $p < .01$) significantly positively predicted hyperarousal distress. COVID-19 disease burden stability was not a significant predictor in any model.

3.3 | Post hoc analyses

Given the extant literature on gendered patterns of caregiving burden in the United States and the important role of having a co-parenting partner (Craig & Mullan, 2010; McCann, et al., 2012; Pinquart & Sörensen, 2006), post hoc analyses using independent samples *t*-tests assessed additional group differences based upon partner status and

TABLE 3 Linear regression for caregiver posttraumatic stress symptoms at 60 days (n = 176)

Variable	B	SE B	β	t	p value	Adj R²
Intrusion distress						.513
Age	−0.00	0.01	−.01	−0.16	.88	
Gender	0.00	0.11	.00	0.03	.97	
Needs met	0.09	0.12	.05	0.75	.45	
Partner status	0.33	0.13	.16	2.48	.02*	
Depression symptomology	0.02	0.01	.25	2.53	.01**	
Daily activity stress appraisal	0.03	0.01	.27	4.14	.00**	
Anxiety symptomology	0.03	0.01	.25	3.00	.00**	
DERS impulse	0.06	0.03	.19	2.29	.02*	
Avoidance distress						.358
Age	0.00	0.01	.03	0.41	.68	
Gender	0.04	0.11	.03	0.38	.70	
Needs met	0.04	0.12	.03	0.36	.72	
Partner status	0.02	0.13	.01	0.17	.86	
DERS nonacceptance	0.10	0.02	.33	4.07	.00**	
Anxiety symptomology	0.03	0.01	.28	3.36	.00**	
Finance stress appraisal	0.04	0.01	.23	3.01	.00**	
Hyperarousal distress						.508
Age	0.00	0.01	.03	0.52	.60	
Gender	−0.04	0.10	−.02	−0.36	.72	
Needs met	−0.11	0.11	−.06	−0.93	.35	
Partner status	0.19	0.13	.10	1.52	.13	
Depression symptomology	0.02	0.01	.22	2.16	.03*	
Anxiety symptomology	0.03	0.01	.27	3.35	.00**	
DERS impulse	0.08	0.03	.26	3.14	.00**	
Infection stress appraisal	0.02	0.01	.16	2.59	.01**	

Note: Gender coding: male = 1, female = 2; Partner status coding: nonpartnered = 0, partnered = 1.
Abbreviation: DERS, Difficulties with Emotion Regulation Scales.
*p < .05; **p < .01.

gender. Two statistically significant group differences are evident: partnered caregivers reported significantly higher rates of anxiety (t = 1.99, p< .05) at baseline and significantly lower rates of intrusion distress at 60 days (t = −2.05, p < .05) than their nonpartnered counterparts. A final examination of the levels of clinical psychological distress was warranted, given the literature on elevated PTSS risks for caregivers and their children (Russell et al., 2020; Samuelson et al., 2017; Wickrama & Kaspar, 2007). Post hoc analyses using independent samples t-tests assessed group differences based upon the clinical cutoff for PTSD diagnosis using the psychological distress measure where total scores above 33 indicate probable PTSD (Creamer et al., 2003). Results indicated 35 (19.9%) caregivers scored above the clinical cutoff. Of these, 23 (65.7%) were female caregivers, and 25 (71.4%) were residing in states with

an increasing COVID-19 burden at the time of data collection. Several statistically significant group differences are evident: caregivers who scored above the clinical cutoff for PTSD at 60 days reported significantly higher stress appraisals of all three types of baseline COVID-19-specific stressors (ts ranging -5.54 to -3.36, all $p < .01$). Additionally, they reported significantly increased use of substance use, active, and behavioral disengagement (ts ranging from -2.86 to -4.38, all $p < .01$) coping strategies. Similar group differences are noted in their reports of baseline mental health, such that those above the clinical cut-off report increased emotion dysregulation (ts ranging from -6.66 to -3.14, all $p<.01$), depression ($t = -6.66$, $p < .01$), anxiety ($t = -6.46$, $p < .01$), and stress ($t = -6.21$, $p < .01$). See Table 4 for detailed group differences including effect sizes.

4 | DISCUSSION

4.1 | Elevated posttraumatic stress among caregviers

Over 20% of the caregivers included in this sample reported levels of PTSS above the clinical cutoff score (compared with 12.6% of their noncaregiver peers and to 5%–10% in the general population; Kessler et al., 1995). As in previous studies, female caregivers report greater distress than their male counterparts (Christie et al., 2019; van Ee et al., 2016). Although striking, these findings are in line with previous literature highlighting the high frequency of increased posttraumatic stress, anxiety, and coping difficulties following community-wide disasters and mass crises (Bolt et al., 2018; Jose et al., 2019; Labarda, et al., 2020; Seto et al., 2019).

These results highlight several clear targets for clinical intervention to support caregivers and their care recipients. High rates of PTSS, which can include angry outbursts or recklessness, intrusive thoughts and distressing dreams; difficulties with memory and concentration, internalized shame and guilt, and avoidance of emotionally salient experiences, places, and people, pose tremendous challenges to social relationships. The burden of PTSS among caregivers may lead to withdrawal and isolation from social supports that are sorely needed during the pandemic. Parenting behaviors among those with PTSD tend to be more hostile and less responsive (Christie et al., 2019; Creech & Misca, 2017; Leen-Feldner et al., 2011; Stover et al., 2012) and children's outcomes when raised by parents with PTSD are also concerning (van Ee et al., 2016; Leen-Feldner et al., 2013; Plant et al., 2017). Future research is warranted to discover the malleable features of parents' trauma sequelae useful in disrupting the intergenerational transmission of mental health challenges stemming from trauma (Belsky & Jaffee, 2006; Greene et al., 2020; Lambert et al., 2014).

4.2 | Predictions of posttraumatic stress

The current set of findings echo previous evidence that caregivers experience potent, negative responses to disasters (Russell et al., 2020; Fussell & Lowe, 2014). In particular, in line with previous studies, our results indicate that baseline mental health symptoms—particularly anxiety and impulsivity—are exacerbated among those who face caregiving burdens during disasters (Juth et al., 2015; Kerns et al., 2014; Maeda & Oe, 2017).

Our results echo evidence that emotion regulation difficulties exacerbate trauma symptoms for this population (Kumar et al., 2019; Samuelson et al., 2017), as seen by consistently stronger correlations between coping and difficulties with emotion regulation among caregivers relative to their noncaregiving counterparts. The emotion regulation factor for difficulties with impulsive responses to stress was consistently among the strongest unique associations with all types of posttraumatic stress for both groups, with stronger effects noted among caregivers. This result echoes research that suggests suppressing impulsive responses to stress is a central component of adaptive emotion regulation (Baumeister et al., 2007; Carver et al., 2009), and is indicative of an increased salience of distress management for those caring for children, given parents' roles as a source of coping socialization (Darling &

TABLE 4 Post hoc differences for caregivers on PTSD clinical cutoff at 60 days

Variable	M (SD) Below PTSD (n = 139)	M (SD) Above PTSD (n = 35)	Group Differences (Cohen's d)
Infection stress appraisal	12.01 (6.62)	18.89 (7.51)	Reported more by caregivers above the PTSD cutoff (d = 1.01)
Activity stress appraisal	15.80 (7.90)	23.34 (9.39)	Reported more by caregivers above the PTSD cutoff (d = 1.16)
Financial stress appraisal	6.94 (3.89)	10.15 (5.16)	Reported more by caregivers above the PTSD cutoff (d = 0.77)
Social distance compliance	94.33 (11.42)	88.40 (19.26)	Reported more by caregivers below the PTSD cutoff (d = 0.44)
Healthy hygiene compliance	87.61 (14.92)	83.25 (15.13)	–
COPE substance use	1.26 (0.62)	1.84 (0.95)	Reported more by caregivers above the PTSD cutoff (d = 0.83)
COPE active	2.45 (0.79)	2.87 (0.78)	Reported more by caregivers above the PTSD cutoff (d = 0.53)
COPE behavioral Disengagement	1.24 (0.48)	1.97 (0.96)	Reported more by caregivers above the PTSD cutoff (d = 1.20)
DERS awareness	6.88 (2.78)	6.71 (2.78)	–
DERS clarity	4.22 (2.05)	5.85 (2.90)	Reported more by caregivers above the PTSD cutoff (d = 0.73)
DERS goals	5.56 (2.65)	8.74 (2.75)	Reported more by caregivers above the PTSD cutoff (d = 1.19)
DERS impulse	4.89 (2.36)	8.20 (2.71)	Reported more by caregivers above the PTSD cutoff (d = 1.36)
DERS nonaccept	5.60 (2.51)	8.51 (2.83)	Reported more by caregivers above the PTSD cutoff (d = 1.13)
DERS strategies	5.27 (2.42)	8.29 (2.82)	Reported more by caregivers above the PTSD cutoff (d = 1.21)
Depression symptomology	5.01 (7.07)	16.86 (9.91)	Reported more by caregivers above the PTSD cutoff (d = 1.54)
Anxiety symptomology	2.94 (5.28)	13.71 (9.51)	Reported more by caregivers above the PTSD cutoff (d = 1.70)
Stress symptomology	7.87 (7.85)	18.97 (9.81)	Reported more by caregivers above the PTSD cutoff (d = 1.34)

Note: Two-tailed independent samples *T*-tests were used for categorical group comparisons. Mean response values were calculated for each subscale to facilitate comparison and interpretability. Standardized effect sizes are based upon Cohen's *d* (0.20 = small, 0.50 = medium, 0.80 = large).

Abbreviations: COPE, Coping Orientation to Problems Experienced; DERS, Difficulties with Emotion Regulation Scales; PTSD, posttraumatic stress disorder; *SD*, standard deviation.

Steinberg, 1993; Maccoby, 1992). The lack of significant associations for the awareness subscale across all models is also in line with previous findings which indicate the factor consistently underperforms (Hallion et al., 2018).

Regression results among caregivers in this sample indicate anxiety symptoms are the most consistent predictor of all posttraumatic stress symptoms over the 60-day period, while the impulse control factor of the DERS-SF only predicted hyperarousal and intrusion posttraumatic stress symptoms. This result suggests that interventions to target management of impulsivity and anxiety symptoms may be particularly helpful. Indeed, research on parenting among those with trauma symptoms posits emotion regulation skills are a protective factor that promotes resilience and indicates that the linkages between trauma history and dysfunctional parenting are more prevalent among those with high emotion dysregulation (McCullough et al., 2017). Future longitudinal studies among larger samples are warranted to test the efficacy of interventions that bolster emotion regulation skills (e.g., distress tolerance or mindfulness to reduce anxiety through Mindfulness-Based Stress Reduction; Kabat-Zinn, 2003).

4.3 | Limitations

While our longitudinal data include highly innovative assessments of COVID-19-specific stressors that highlight differential impacts among vulnerable subpopulations, several limitations should be noted. These data provide a snapshot of families' early experiences during the height of the first peak in the US COVID-19 pandemic in early April and again as rates surged nationwide during early July of 2020; stronger inferences concerning enduring impacts will require additional follow-up. MTurk recruitment enables rapid collection of data at the national scale from individuals with access to online technology, however, MTurk participants may differ from caregivers drawn from the general population. These differences may affect response patterns and indicates caution should be exercised in using these data to estimate prevalence. While nearly half of the study participants reported not having adequate financial resources to meet their needs, MTurk workers are resourced with hardware and reliable internet access that may not be true of most families, particularly those from disadvantaged communities. Nevertheless, our explanatory models and correlational relationships between key variables provide a useful approximation. Finally, our baseline survey was designed in March of 2020 for data collection the following month, when it was unclear how long COVID-19 would impact daily routines in the United States and no measure of posttraumatic experiences was included at that time. This was amended within 2 weeks of data collection in May, when epidemiologists indicated society should expect enduring impacts, thus, we were unable to control for posttraumatic stress symptoms in April.

Data from both asessments points represent moments in time that play an important role in the nation's COVID-19 story: The 7-day average for new COVID-19 cases in the United States peaked at 31,000 cases per day April 10, at exactly the mid-point of our baseline data collection window. Rates of new cases were surging far past this point when we launched the 60-day follow-up survey at the end of the public school year. We note the distribution of caregivers varied by geographic region such that the highest proportion of parents were located in the Midwest—where COVID-19 daily reported cases were still relatively low at that time—compared with the low rates of caregiver participation from Northeast where the disease was surging. Better inferences about the impact of disease rates in a region would be possible with equal sized caregiver/noncaregiver cells by geographic state or municipality. Additionally, our measure of caregiving (a binary indicator of caregiving status) was limited. Future work will benefit from additional information on caregiving practice, parenting behavior, or relationship dynamics as the pandemic unfolds.

4.4 | Conclusions and implications for practice

The Centers for Disease Control (2020) emphasizes the need to manage stress and protect mental health during the pandemic, offering specific guidance for families with children. As the COVID-19 pandemic reaches into its second

calendar year, US communities are still modifying and adapting the schedule and provision of educational services and their associated supports (including before and after school care, access to specialist interventions for children's mental health, speech, reading, and occupational or physical therapy, or free and reduced-cost meals), creating ambiguity in on-going and inconsistent service provision system parents must navigate. These are crucial elements of family experience with strong implications for needed emergency supports (Horesh & Brown, 2020). There is recognition among family scientists that nurturing and responsive caregiving acts as a buffering influence against negative child mental health outcomes (Greene et al., 2020; Morris et al., 2017). Family interventions that provide support to parents can be an important mechanism to bolster parents' mental health with potential spill-over effects for parent-child relationships (Russell et al., 2021, in press). These resources may be particularly vital for families facing high risk by dint of cumulative individual, contextual and even institutionalized stressors; we note that nearly 43% of the current sample reported lacking financial resourced adequate to meet their needs.

The mental health community carries responsibility for monitoring the distress among vulnerable families, and for responding in timely ways when families' experience over the weeks and months of the pandemic increase the likelihood of psychiatric difficulties. Practitioners will need to be attentive to the energy caregivers have to sustain high levels of protective socially distant behaviors that create barriers to established support exchanges while modeling active and adaptive coping strategies for those in their care, particularly those with pre-existing vulnerabilities and heightened needs (e.g., families with children who have exceptional learning needs, disability, or chronic health conditions). Services that support relational and emotion regulation outcomes by targetting parent-child interactions and coping skills are promising effective intervention approaches (Bernard et al., 2015; Compas et al., 2010; Eshel et al., 2006).

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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