

The roles of life stress and preventive health behaviors on parent mental health during the COVID-19 pandemic

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Abstract

The COVID-19 pandemic has disrupted millions of lives, with life stress and daily hassles having a potential impact on parent mental health. This study examined whether preventive health behaviors (e.g. social distancing, mask wearing) and social support relate to parent mental health. In a cross-sectional analysis of parents ($N = 176$, May–September 2020), life events and daily hassles were positively associated with depressive and anxiety symptoms. Preventive health behaviors moderated the association between daily hassles and depressive symptoms. Preventive health behaviors may protect those with high levels of daily hassles from moderate levels of depression.

Keywords

anxiety, behavioral medicine, coping, depression, health behavior

Implications

Practice: The promotion of preventive health behaviors may be a useful means for helping parents cope with daily hassles, beyond addressing viral contagion.

Policy: Advocacy around preventive behaviors such as social distancing and handwashing may not only mitigate the spread of COVID-19, but may reduce the effects of daily stress on parent mental health.

Research: Future research should examine the mechanisms involved in how preventive health behaviors might reduce the effects of routine stress on mental health.

Introduction

Considering the enormous direct and indirect effects on physical and mental health due to the COVID-19 pandemic (Arora et al., 2020) is critical, as the pandemic is arguably the most significant public health crisis of the current

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generation. More specifically, the pandemic has disrupted the lives of millions of U.S. parents (Patrick et al., 2020), severely impacting their mental health (American Psychological Association, 2020; Davidson et al., 2021; Lee et al., 2021; Patrick et al., 2020). Major life stressors ranging from job loss to the transition to remote work and school have significantly increased (Liu and Doan, 2020); thus, parents are confronted with financial stress, parenting and childcare burdens, and, for many, home-schooling demands (Davidson et al., 2021). Patrick et al. (2020) found that nearly a quarter of their parent sample experienced the disruption or loss of regular childcare. Such disruptions and readjustments to new routines are a major source of stress for 74% of parents (American Psychological Association, 2020). Furthermore, vigilance regarding the transmission of the coronavirus is commonplace as part of a “new normal.” Many people have modified their health behaviors, including mask wearing, social distancing, and frequent hand-washing, and parents are expected to model and teach their children these behaviors as part of their caregiving responsibilities. In sum, the scope of life events and behavior changes is considerable (Arora and Grey, 2020); here we examine the extent to which such burdens and possible protective factors contribute to parent mental health.

The link between major life events (e.g. job loss, the death of a loved one) and mental health is well-established. Stressful life events are consistently associated with anxiety and depression in community samples (Zou et al., 2018) and have been found to precede major depressive episodes (Tennant, 2002), as well as the onset of anxiety disorders (Miloyan et al., 2018). Notably, life events following major disasters (e.g. earthquakes, terrorist attacks) appear to be associated with depressive and anxiety symptoms and other mental health problems (Jin et al., 2018; Maes et al., 2001; Xu et al., 2018; Zvolensky et al., 2015), in terms of both their severity and chronicity (Zvolensky et al., 2015). Together, these findings demonstrate the

importance of assessing major life events and their impact, as in the case of a pandemic.

Studies examining life stress during the course of the COVID-19 pandemic are now emerging. For example, Chinese college students’ COVID-19 related stressors, such as worry about economic impacts or academic delays, were significantly associated with increased anxiety symptoms (Li et al., 2020). Among young adults from Zurich, Germany, COVID-19 disruptions to lifestyle and economic situations were associated with emotional distress, including perceived stress, internalizing symptoms, and anger (Shanahan et al., 2020). Among U.S. adults 18 years and older, those who endorsed a higher number of COVID-19 life stressors were more likely to report depressive symptoms (Ettman et al., 2020). Life events appear to be associated with mental health based on data collected from adults around the world during the pandemic, mirroring the associations observed under non-pandemic conditions.

Distinct from major life events are daily hassles, which refer to “irritating, frustrating, and distressing demands of everyday life” (Chen, 2020). Chronic or repetitive in nature, daily hassles uniquely predict adult physical (DeLongis et al., 1982; Fernandez and Sheffield, 1996; Weinberger et al., 1987) and psychological (DeLongis et al., 1982; Kanner et al., 1981; Serido et al., 2004) outcomes. Indeed, Kanner et al. (1981) discovered that hassles and psychological symptoms remained significantly correlated after removing effects due to life events. This finding was also found by Serido et al. (2004): after controlling for ongoing chronic stressors, higher levels of psychological distress were reported when individuals experienced high levels of daily hassles. Daily hassles stem from multiple adjustments to home life within families during the pandemic, but research on hassles and their effect on parents’ mental health during the COVID-19 pandemic is limited. To our knowledge, there is only one study involving U.S. parents which showed the stress related to the new demands pertaining to

work or parenting and other daily hassles from the pandemic to be associated with increased depressive symptoms (Daks et al., 2020).

What remains unknown is how the preventive health behaviors (e.g. avoiding crowds, mask wearing, quarantining) which have taken place during the pandemic and sources of social support are related to parent mental health. It is possible that increased vigilance about viral contraction or transmission, tied to these behaviors, is associated with greater worry (Kapoor and Tagat, 2021), fear (Giordani et al., 2020), and anxiety, especially for parents whose caregiving role involves protecting the health of their children and family members. On the other hand, it is possible that preventive health behaviors constitute a means of active coping that may be optimal for one's mental health (Li and Xu, 2020; Nelson et al., 2014). Similarly, social support typically buffers against the stresses of parenting (Nelson et al., 2014). The impact of adopting preventive health behaviors and feeling supported by others on mental health symptoms remains largely unknown.

To address the current gaps in our understanding of factors that contribute to parent mental health during the COVID-19 pandemic, we examined major life changes and hassles during the pandemic as risk factors for mental health among a U.S. sample of mothers of young children through a cross-sectional analysis. We hypothesized that reported changes in life events and daily hassles would be associated with higher maternal symptoms of depression and generalized anxiety. Furthermore, we hypothesized that engaging in COVID-19 preventive health behaviors, as well as receiving social support, particularly tangible support, would serve as protective factors for these symptoms. To our knowledge, this is the first study that examines whether risk factors, including COVID-19 related life events and hassles, contribute to the mental health of parents, while examining the role of health behaviors and social support on risk abatement.

Methods

Research reporting

We follow the STROBE checklist as a research reporting guideline.

Study design and population. This is a cross-sectional analysis of online survey data completed by a sample of U.S. parents with children under the age of 9 years. The participants for this study were recruited from a database of families who have participated in studies in our lab, a recruitment approach that is commonly used in developmental studies. The families in this database consisted of those who were initially recruited through social media and word-of-mouth in local parenting groups. Families came from regions across the U.S. with a majority from Southern California. The families took part in observational studies focused on parenting, stress, and emotion regulation in preschool and school-aged children, and who expressed interest in continued participation with our lab studies ($N=276$). As such, those in our database have experience with participating in a research study. Mothers from our database who were eligible were invited to participate in an online COVID-19 survey and an observational study with their children. Eligibility for this study was limited to mothers with English-speaking children under the age of 9 years. There was no clinical rationale for enrolling this group given our interest in studying typically developing parents and children and the potential effect of COVID-19-related disruptions on their behavior and experience. Mothers received an invitation by email to participate and those who expressed interest were provided a unique link to an online survey using the Qualtrics platform. Upon signing a written virtual consent form, mothers were directed to a battery of surveys, which took 45 minutes to 1 hour to complete. Given that our study purpose focuses on parent mental health, we rely only on the survey data of the mothers who completed the surveys pertaining to the measures central to this particular analysis ($N=176$, May 12–September

10, 2020), which represents a response rate of 63.7%. All materials and surveys were reviewed and approved by the Pomona College Institutional Review Board under file #04/29/2016JB-MP.

Measures

Predictors

Severity of Hassles. The Hassles and Uplifts Scale (HUS) was used to measure how many hassles, or irritants, mothers dealt with on a daily basis (Kanner et al., 1981). For the purposes of our study, participants were only given the hassles portion of the questionnaire (53 items). Participants rated each hassle on a 4-point scale (from 0 = “None or not applicable” to 3 = “A great deal”) and these ratings were summed to measure the total impact of hassles identified. Examples of hassles include “meeting deadlines or goals on the job,” “enough money for necessities,” and “housework.” Participants reported their experience in response to a prompt that asked about “hassles since the COVID-19 pandemic began on March 13, 2020” (possible scores ranged from 0 to 159). Note that participants also reported hassles at the baseline pre-pandemic time point. As an additional measure, to examine whether *increases* in the severity of hassles were related to the pandemic, we examined the correlation between the difference in severity of hassles before and during the pandemic and the total sum of COVID-19-related stressors (CRS, see below), which showed a positive association ($r=0.210$, $p=0.012$). Cronbach’s alpha for the HUS measure involving this sample was .93.

COVID-19 related stressors (CRS). A set of questions to assess COVID-19 related stressors was developed by including items from questionnaires pertaining to stressful life events, including the Social Readjustment Rating Scale (Holmes and Rahe, 1967) and the Recent Life Events Questionnaire (Brugha et al., 1985). Other stressors specifically related to the COVID-19 pandemic (e.g. fear of disease transmission, self or family member testing positive

for COVID-19, difficulty with remote work) were also included. This resulted in a 30-item questionnaire where mothers indicated whether they experienced a pandemic-related stressor (e.g. lost a job, became sick from COVID-19, etc.) since the beginning of the pandemic. If an event was endorsed, participants were asked the question “What was the impact of this stressful life event?” and to provide a rating using a scale of 1 (“Not really negative”) to 3 (“Very negative”). The sum of the impact of all experienced events was used as the CRS score.

Social support. The RAND Social Support survey is a 19-item survey that is rated on a 5-point Likert scale (1 = “None of the time” to 5 = “All of the time”) that covers various domains of social support (Sherbourne and Stewart, 1991). The 4-item tangible social support subscale (scored on a 1–5 scale) was used for analyses given its salience to the needs of parents. These items included “Someone to help you if you were confined to bed,” “Someone to take you to the doctor if you needed it,” “Someone to prepare your meals if you were unable to do it yourself,” and “Someone to help with daily chores if you were sick.” Mean scores were used in the analysis. Cronbach’s alpha for the measure in this sample was .92.

COVID-19 health behaviors. To gauge adherence to COVID-19 health guidelines, we created a COVID-19 Health Behaviors Scale. This scale consists of 16 items in which nine items were drawn from the survey “Coping with COVID-19 Outbreak Study” developed by DeLongis and Sin (2020) (e.g. “Washed your hands more often than usual”). The other seven items are self-designed and based on government and CDC recommendations at the time (e.g. “Canceled or avoided events that involve more than 10 people”). These items were rated on a scale from 0 (“Not at all”) to 4 (“Always”). An exploratory factor analysis was conducted with the items for this measure prior to analysis. The items were subjected to a principal-axis factor analysis with varimax rotation, with factors that had eigenvalues greater than 1. This yielded

a total of four factors with eigenvalues ranging from 1.05 to 5.38. Each factor was evaluated on the basis of item factor loadings (>0.30) and whether the factors made conceptual sense. For one item, the factor loading was 0.28; however, it was retained given that it was conceptually similar to the other items in that factor. Four factors were retained, comprising 9, 2, 2, and 3 items, accounting for 26.17%, 9.721%, 7.65%, and 3.46% of the total variance, respectively. The four factors represented the following: (a) avoidance of others, (b) cleaning (e.g. washing hands more than usual), (c) avoiding contagion (e.g. careful about not tracking germs into your house), and (d) overall health hygiene (e.g. taken herbal supplements or vitamins). For our analysis, the measure was scored by taking the sum of all 16 items (possible range, from 0 to 64). Higher scores indicated more adherence to the COVID-19 health guidelines. Given that the Cronbach's alpha for all the items was 0.80, we chose to use the whole scale as a construct.

Outcomes

Depression. Depression was measured using the Beck Depression Inventory-II (BDI-II) (Beck et al., 1996). The BDI-II consists of 21 items (e.g. "Sadness," "Guilty Feelings"), and participants rated each item on a scale from 0 (e.g. "I do not feel sad") to 3 (e.g. "I feel guilty all the time"). Due to the virtual nature of the survey and our inability to appropriately address suicidal concerns, we removed the "Suicidal Thoughts or Wishes" item before administering the scale to participants. These items are summed (possible range from 0 to 63), with higher scores indicating higher levels of depression. Cronbach's alpha for the measure was 0.91.

Generalized anxiety. The Generalized Anxiety Disorder Scale (GAD-7) was used to measure maternal anxiety (Spitzer et al., 2006). This 7-item measure (e.g. "Feeling afraid as if something awful might happen") is rated on a 4-point scale that asks how often each symptom occurs for the participant (0="Not at all sure,"

3="Nearly every day"). Ratings were summed to create an overall anxiety score (possible range: 0 to 21) with higher scores indicating increased levels of anxiety. Cronbach's alpha for the measure was 1.0.

Potential confounders. Participants were asked to provide their age, highest level of maternal education, household income, race, ethnicity (Hispanic or non-Hispanic), and child sex (male, female); these demographic variables were included as covariates. In analyses, maternal education was recoded into a three-level scale variable: less than a bachelor's degree, bachelor's degree, and graduate degree. As well, household income was recoded into three levels: less than \$40,000, \$40,000–79,999, and $\geq$ \$80,000. Maternal race as recoded as White and non-White (all other racial categories).

Statistical analyses

A power analysis was conducted using G*Power which determined that a sample size of at least 159 would be required to detect an effect size of 0.10 given an alpha of 0.05 and power at 0.80.

Distributions of variables were examined prior to analysis. Variables were normally distributed with the exception of COVID-19 health behaviors, which showed a positive skew. This variable was log-transformed. The predictors showed acceptable levels of collinearity, with VIF scores less than 5. A series of multiple regression models with blocks of predictors added sequentially were conducted to examine associations between the predictors and depressive and anxiety symptoms. Block 1 included key sociodemographic variables: maternal age, education and race, household income, child age and sex, and the number of individuals in the household. Block 2 included life events, daily hassles, COVID-19 health behaviors, and social support. Block 3 included the interaction terms of interest, which considered COVID-19 preventive health behaviors and social support as effect moderators. These interaction terms included life events $\times$ COVID-19 health

Table 1. Key sample characteristics of parent participants, data collected between May 12 and September 10, 2020.

Predictors	Mean or %
Maternal age (years)	36.3 (Range = 24–50, SD = 5.1)
Maternal education	
High school	5.7%
Some college	18.8%
Community college	6.8%
Bachelor's degree	22.7%
Graduate degree	46.0%
Household income (USD/year)	
<\$20,000	7.4%
\$20,000–\$39,999	10.2%
\$40,000–\$59,999	7.4%
\$60,000–\$79,999	9.1%
\$80,000–\$99,999	4.5%
\$100,000–\$119,999	2.3%
\$120,000–\$149,999	4.5%
\$150,000–\$174,999	2.3%
≥\$175,000	4.5%
Maternal race	
American Indian/Alaskan native	1.1%
Asian/Asian American	9.1%
Black/African American	1.1%
White/Caucasian	67.6%
Other/multiracial	18.8%
Child sex	
Male	51.4%
Female	48.6%
Child age (months)	71.7 (Range 45–107, SD = 11.2)
Number of people in the home	4.4 (Range 2–7, SD = 1.0)

N = 171–176.

behaviors, daily hassles $\times$ COVID-19 health behaviors, life events $\times$ social support, and daily hassles $\times$ social support. There were missing data from six cases for maternal age and one case for depression. Listwise deletion was used to handle missing data. SPSS 26.0 was used for all analyses.

Data sharing. Accessible with the current article is the complete raw dataset collected in the study including the participants' data set, syntax file, and log files for analysis. Data files will be automatically uploaded to the Figshare repository.

Results

Table 1 presents the demographic characteristics of our participants. On average, women were 36.3 years of age. More than 30% had less than a bachelor's degree, 25% had yearly household incomes of less than \$60,000, and two-thirds identified as White. Approximately equal numbers of mothers reported their child as male or female. The average age of children was 71.7 months. On average, there were 4.4 people within the household during the pandemic. Among the mothers, 15.1% worked less than 20 hours outside of the home prior to the pandemic, and 50.6% reported a change in

Table 2. Key variable characteristics of parent participants, data collected between May 12 and September 10, 2020.

Variables	Mean
Predictors	
Life events	20.9 (9.5)
Daily hassles	37.2 (21.2)
COVID-19 preventive health behavior	50.0 (8.2)
Social support	4.1 (1.1)
Outcomes	
Depressive symptoms	11.2 (8.8)
Anxiety symptoms	7.0 (5.1)

N = 175–176.

their employment during the COVID-19 pandemic.

Table 2 displays the mean scores for the primary variables. On average, participants reported being impacted by life events with a score of 20.9 out of a total possible 81 and impacted by daily hassles with a score of 37.2 out of a total possible 159, indicating having “none to somewhat” in their experiences of hassles. With respect to COVID-19 preventive health behaviors, participants scored on average 50.0 out of a possible total of 64, indicating that they were “often to always” engaging in preventive behaviors. The average score for social support was 4.1, indicating social support occurring “most of the time to all the time.” The mean score for depression was 11.2, indicating that participants were on average, showing mild depression (BDI range for mild depression = 10–18; Butcher et al., 1998). The mean score for generalized anxiety was 7.0, indicating that participants were on average experiencing mild anxiety (GAD-7 range for mild anxiety = 5–9; Spitzer et al., 2006).

Table 3 reports the regression models with depression and generalized anxiety scores regressed on demographic variables in Block 1, and life events, daily hassles, COVID-19 health behaviors, and social support in Block 2. Life events and daily hassles showed significant positive associations with depression (life events: $\beta = 0.364$, $p = 0.001$; daily hassles:

$\beta = 0.503$, $p < 0.001$) and generalized anxiety (life events: $\beta = 0.381$, $p = 0.001$; daily hassles: $\beta = 0.468$, $p < 0.001$), with these blocks accounting for 46.3% and 37.0% of the variance for depression and generalized anxiety, respectively. We then examined the potential moderating roles of COVID-19 health behaviors and social support. Predictor variables were first centered at zero to minimize collinearity (Baron and Kenny, 1986). In the final model, we detected a significant moderating effect of COVID-19 health behaviors ($\beta = -0.188$, $p < 0.05$) on the association between daily hassles and depression.

The PROCESS regression macro for IBM SPSS was used to perform a simple slopes test, examining effects at three values of the moderator (−1 SD below the mean, at the mean, +1 SD above the mean). As shown in Figure 1, hassles and depression were positively associated when COVID-19 health behaviors were low ($\beta = 0.314$, $t = 5.195$, $p < 0.001$) and at the mean ($\beta = 0.225$, $t = 5.77$, $p < 0.001$). This positive association between hassles and depression was also observed at a high level of COVID-19 health behaviors, albeit weaker ($\beta = 0.136$, $t = 2.666$, $p = 0.01$).

Discussion

The purpose of this study was to examine how life changes during the COVID-19 pandemic contribute to mental health among U.S. mothers from a community sample. Specifically, we examined two potential risk factors (life events, daily hassles), two potential protective factors (adoption of health behaviors, tangible social support), and their interactions as possible contributors to maternal mental health (depressive, anxiety symptoms). To our knowledge, this is one of the first studies to examine risk and protective factors of maternal mental health during the COVID-19 pandemic in the U.S.

Although levels of depressive and anxiety symptoms were in the mild range on average, higher levels of both life events and daily hassles were positively associated with greater

Table 3. Multiple regression predicting depressive and anxiety symptoms among U.S. parents during the COVID-19 pandemic, based on sociodemographic variables, life events, daily hassles, COVID-19 health behaviors, and social support.

Blocks of variables entered in three steps	Depression (BDI)		Generalized anxiety GAD-7	
	B	R ²	B	ΔR ²
Block 1		0.113		0.125
Maternal age (years)	-0.028		-0.095	
Maternal education (ref ≤ Bachelors)				
Bachelors	-0.138		-0.094	
Graduate	-0.156		-0.240	
Household income (ref ≤ \$41,000)				
\$41,000–\$80,000	0.012		0.123	
>\$80,000	0.025		0.080	
Maternal race (ref = White)				
Non-White	-0.029		0.038	
Child sex (ref = male)	0.051		0.089	
Child age (months)	0.072		-0.112	
Number of people in the home	-0.106		-0.175	
Block 2		0.499		0.495
Life events	0.364**		0.381**	
Daily hassles	0.503***		0.468***	
COVID-19 preventive health behaviors	-0.084		0.067	
Social support	0.002		-0.141	
Block 3		0.503		0.555
Life events × COVID-19 preventive health behaviors	0.034		0.086	
Daily hassles × COVID-19 health preventive behaviors	-0.188*		-0.116	
Life events × Social support	-0.053		-0.053	
Daily hassles × Social support	0.004		0.230†	

Final model retained the one covariate that showed a significant association in the first block. N = 170 (depression), 171 (generalized anxiety). †p < 0.1. *p < 0.05. **p < 0.01. ***p < 0.001.

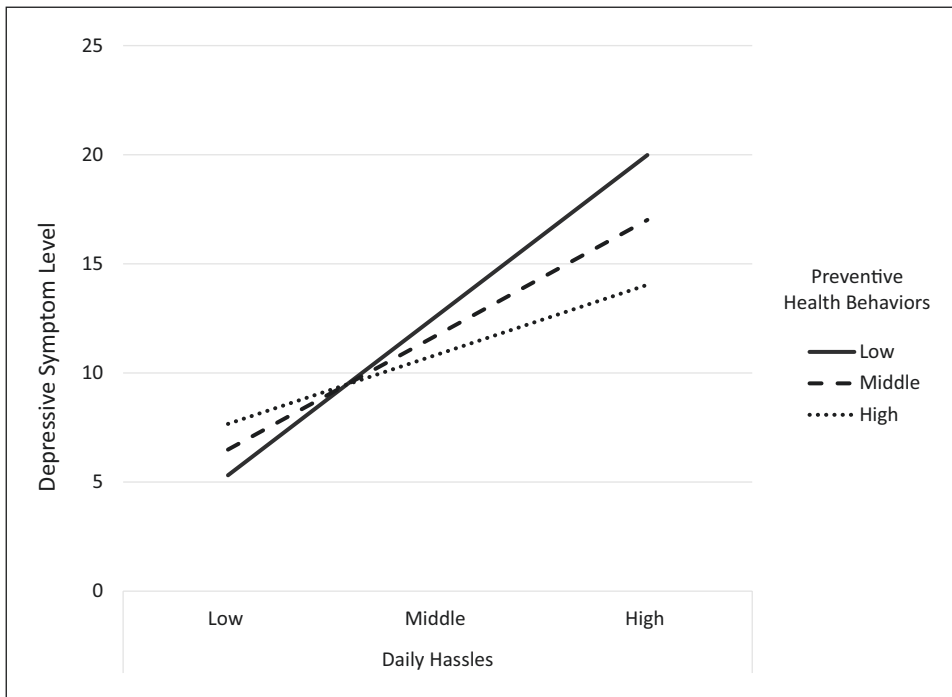


Figure 1. Depressive symptom scores by daily hassles and levels of COVID-19 preventive health behaviors.

depressive and anxious symptomatology. The association between perceived impact of life events during the COVID-19 pandemic, such as job loss, missed events, and interpersonal conflict, is consistent with existing literature showing stressful life events to be prospectively predictive of symptoms of depression and anxiety (Cohen et al., 2019). Such life events such as these can pose a threat to one's social status and well-being and accordingly, one's mental health; thus, they are essential to examine during the pandemic, alongside threats to one's physical health from the COVID-19 disease itself. Further, recent exposures are a robust risk factor for episodes of major depressive disorder (Cohen et al., 2019; Hammen, 2005; Tennant, 2002), with recent stressful life events predicting greater symptom severity, longer illness duration, and increased likelihood of relapse (Tennant, 2002). This body of research, together with our findings, suggests that in some cases, subsequent longer-term mental health concerns will need to be addressed.

The perceived impacts of daily hassles reported by parents, defined as experiences that annoy or bother an individual such as housework, cooking, or meeting deadlines, were also associated with increased depression and generalized anxiety during the pandemic. Daily hassles have been shown to exert a unique effect on mental health outcomes, particularly internalizing symptoms (Bridges-Curry et al., 2021). We note that stressful life events may generate daily hassles. For example, a parent's job loss could have cascading effects that exacerbate everyday burdens of housework or irritation with other family members. In turn, when events or hassles exceed a person's coping abilities, depressive symptoms such as withdrawal, fatigue, and sleep problems (National Institute of Mental Health, 2018b), or anxious symptoms such as bodily upsets, worry, and distractibility (National Institute of Mental Health, 2018a), can ensue.

The scores used to assess both life events and daily hassles reflect their perceived impact, in other words, one's appraisal of the events,

which may play an important role in long-term outcomes (Monroe and Kelley, 1995). While not everyone who experiences a significant level of stressful life events or daily hassles will develop these conditions, our findings indicate that the perceived impact of experiences that have taken place during the pandemic, or those believed to be attributable to the pandemic, may predispose individuals to develop mental health concerns.

COVID-19 preventive health behaviors, such as hand washing and physical distancing, were not directly associated with either depression or generalized anxiety among our participants. However, the association between daily hassles and depressive symptoms for this relatively low-risk sample was moderated by the level of COVID-19 preventive health behaviors. For those who reported high levels of hassles, the magnitude of the difference in depressive symptoms between those engaging in high and low COVID-19 preventive health behaviors is notable. Those with low preventive behaviors showed depressive scores within the moderate depression range (BDI scores of 19–29), whereas those with high preventive behaviors showed scores in the mild range (BDI scores of 10–18). Thus, engagement in preventive health behaviors may protect mothers who experience high levels of daily hassles from moderate levels of depression.

Although COVID-19 preventive health behaviors can be associated with psychological distress and fear (Chang et al., 2020; Giordani et al., 2020; Odriozola-González et al., 2020), our data demonstrate that high levels of preventive health practices within a community sample of mothers are not directly associated with psychological distress. Preventive behaviors might reflect self-efficacy—the extent of one’s perceived ability to cope with stress (Bandura, 2006)—and one’s perceived ability to cope has been related to increased knowledge related to COVID-19 (Yıldırım and Arslan, 2020). If individuals perceive value in engaging in preventive behaviors to reduce disease risk (Lee et al., 2020; Somma et al., 2020), and consciously adopt those habits, this could

explain why health behaviors impact the association between daily hassles and depressive symptoms, especially if daily hassles are perceived as uncontrollable; a sense of loss of control is a central symptom of depression (Mirowsky and Ross, 1990). Similarly, dispositional hope has been implicated in the use of preventive behaviors (Yıldırım and Arslan, 2020), perhaps because those with higher levels of hope are better able to navigate difficult circumstances. Thus, optimism might also buffer the effect of daily hassles on depression. Finally, it is intriguing that tangible or instrumental social support was not associated with either depressive or generalized anxiety symptoms as a main effect or moderator in the associations with life events or hassles. The mothers in our sample reported having tangible support at a relatively high level (i.e. “most of the time”) and high levels of such support have been associated with decreased mental health problems (Leahy-Warren et al., 2012; Park et al., 2010). Yet, tangible support is not consistently associated with well-being (Morelli et al., 2015; Penninx et al., 1998; Zysberg and Zisberg, 2020), and it is possible that the scale was not sufficiently tailored to mothers’ experiences with the pandemic. For example, the lack of association may be due to limited variation in participant responses. Future research should consider distinctions between types of social support and their relation to outcomes within the context of stressors during a pandemic.

Limitations

These findings should be understood within the context of a number of methodological limitations. Mothers’ self-report of experiences may be prone to bias. As well, selection bias is possible given that participants were drawn from a database of mothers who expressed interest in participating in studies. Those who are willing to volunteer may be less stressed in general. Our sample may not be generalizable to other U.S. parents, as those who live in Southern California may have a different experience with parenting and stress within the context of the

COVID-19 pandemic. Those with depression or anxiety may be more sensitive or reactive to perceived life stress or daily hassles and therefore may report elevated scores on all measures. While we were sufficiently powered to detect main and interaction effects, we were not able to examine additional subgroup analyses within this study (e.g. race). Although our sample is relatively diverse, these potential biases in our sample should be noted as they limit the generalizability of our results. As well, the boundaries between stressful life events and daily hassles are not always easily delineated. Finally, as a cross-sectional study, causal interpretations cannot be made.

Clinical implications

Our study focused on the mental health of parents during the COVID-19 pandemic, particularly given the increased caregiving roles for mothers of young children during this time. We provide evidence that the perceived impact of life events and daily hassles experienced during the pandemic might play a pivotal role in risk for maternal mental health symptoms. Accordingly, the provision of resources should be prioritized for families, to address mental health concerns during and after the pandemic. Our findings suggest that adopting new preventive health behaviors, such as social distancing and handwashing, may modulate the risks of daily hassles on depressive symptoms. While we showed this with our sample, such behaviors should be considered in relation to understanding mental health across a broader population. Preventive health behaviors have been broadly advocated throughout the COVID-19 pandemic, and these behaviors may be a useful means or serve as an added benefit in helping individuals cope with daily hassles beyond addressing viral contagion, as shown in our data. Although further research should be conducted to examine how exactly preventive health behaviors might operate on mental health, for example, via self-efficacy or optimism, promotion of these behaviors should continue during the pandemic, especially given

the dual positive impacts that it may have on health in general.

Author contributions

C.H.L. conceptualization, formal analysis, writing—original draft, writing—review and editing, visualization, supervision. P.A.S. conceptualization, writing—review and editing, supervision. S.N.D. conceptualization, writing—review and editing, supervision. J.M.V. project administration, writing—original draft, review and editing. G.F.W. project administration, review and editing.

Declaration of conflicting interests

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Ethical approval

All procedures were in accordance with the ethical standards of the institution and were approved by the Pomona College institutional review board.

Transparency statement

The study was not formally registered. The analysis was not formally pre-registered. De-identified data from the study are not available in an public archive. De-identified data from this study will be made available (as allowable according to institutional IRB standards) by emailing the corresponding author. There is no analytic code associated with this study. Materials used to conduct the study are not publicly available.

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References

- American Psychological Association (2020) Stress in America™ 2020: a national mental health crisis. October 2020. Available at: <https://www.apa.org/news/press/releases/stress/2020/sia-mental-health-crisis.pdf>
- Arora T and Grey I (2020) Health behaviour changes during COVID-19 and the potential consequences: A mini-review. *Journal of Health Psychology* 25(9): 1155–1163.
- Arora T, Grey I, Östlundh L, et al. (2020) The prevalence of psychological consequences of COVID-19: A systematic review and meta-analysis of observational studies. *Journal of Health Psychology*. Epub ahead of print 29 October 2020. DOI: 10.1177/1359105320966639.
- Bandura A (2006) Guide for constructing self-efficacy scales. *Self-Efficacy Beliefs of Adolescents* 5(1): 307–337.
- Baron RM and Kenny DA (1986) The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 51(6): 1173–1182.
- Beck AT, Steer RA and Brown G (1996) *Beck Depression Inventory–II* [Database record]. APA PsycTests. Psychological Assessment. DOI: 10.1037/t00742-000.
- Bridges-Curry Z, Glenn LE and Felton JW (2021) Are emotions better left unknown? Sex-specific effects of emotional awareness and daily hassles on internalizing symptoms among college students. *Journal of American College Health* 69(1): 113–117.
- Brugha TS, Bebbington PE, Tennant C, et al. (1985) The list of threatening experiences: A subset of 12 life event categories with considerable long-term contextual threat. *Psychological Medicine* 15: 189–194.
- Butcher JN, Taylor J and Cynthia Fekken G (1998) 4.14 – Objective personality assessment with adults. In: Bellack AS and Hersen M (eds) *Comprehensive Clinical Psychology*. Oxford: Pergamon, pp.403–429.
- Chang K-C, Strong C, Pakpour AH, et al. (2020) Factors related to preventive COVID-19 infection behaviors among people with mental illness. *Journal of the Formosan Medical Association* 119(12): 1772–1780.
- Chen F (2020) Effects of daily parenting uplifts on well-being of mothers with young children in Taiwan. *Journal of Family Issues* 41(4): 542–561.
- Cohen S, Murphy MLM and Prather AA (2019) Ten surprising facts about stressful life events and disease risk. *Annual Review of Psychology* 70: 577–597.
- Daks JS, Peltz JS and Rogge RD (2020) Psychological flexibility and inflexibility as sources of resiliency and risk during a pandemic: Modeling the cascade of COVID-19 stress on family systems with a contextual behavioral science lens. *Journal of Contextual Behavioral Science* 18: 16–27.
- Davidson B, Schmidt E, Mallar C, et al. (2021) Risk and resilience of well-being in caregivers of young children in response to the COVID-19 pandemic. *Translational Behavioral Medicine* 11(2): 305–313.
- DeLongis A, Coyne JC, Dakof G, et al. (1982) Relationship of daily hassles, uplifts, and major life events to health status. *Health Psychology* 1(2): 119–136.
- DeLongis A and Sin N (2020) Coping with the COVID-19 outbreak study – University of British Columbia. Available at: <https://blogs.ubc.ca/coronavirus/> (accessed 18 April 2021).
- Ettman CK, Abdalla SM, Cohen GH, et al. (2020) Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Network Open* 3(9): e2019686.
- Fernandez E and Sheffield J (1996) Relative contributions of life events versus daily hassles to the frequency and intensity of headaches. *Headache: The Journal of Head and Face Pain* 36(10): 595–602.
- Giordani RCF, Zanoni da Silva M, Muhl C, et al. (2020) Fear of COVID-19 scale: Assessing fear of the coronavirus pandemic in Brazil. *Journal of Health Psychology*. Epub ahead of print 16 December 2020. DOI: 10.1177/1359105320982035.
- Hammen C (2005) Stress and depression. *Annual Review of Clinical Psychology* 1: 293–319.
- Holmes TH and Rahe RH (1967) The social readjustment rating scale. *Journal of Psychosomatic Research* 11(2): 213–218.
- Jin Y, Sun C, Wang F, et al. (2018) The relationship between PTSD, depression and negative life events: Ya'an earthquake three years later. *Psychiatry Research* 259: 358–363.
- Kanner AD, Coyne JC, Schaefer C, et al. (1981) Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life

- events. *Journal of Behavioral Medicine* 4(1): 1–39.
- Kapoor H and Tagat A (2021) Worry much? Preventive health behaviours related to worry across countries amid COVID-19. *Journal of Health Psychology*. Epub ahead of print 5 March 2020. DOI: 10.1177/1359105321999090.
- Leahy-Warren P, McCarthy G and Corcoran P (2012) First time mothers: Social support, maternal parental self efficacy and postnatal depression. *Journal of Clinical Nursing* 21(3–4): 388–397.
- Lee JJ, Kang K-A, Wang MP, et al. (2020) Associations between COVID-19 misinformation exposure and belief with COVID-19 knowledge and preventive behaviors: Cross-sectional online study. *Journal of Medical Internet Research* 22(11): e22205.
- Lee SJ, Ward KP, Chang OD, et al. (2021) Parenting activities and the transition to home-based education during the COVID-19 pandemic. *Children and Youth Services Review* 122: 105585.
- Li S and Xu Q (2020) Family support as a protective factor for attitudes toward social distancing and in preserving positive mental health during the COVID-19 pandemic. *Journal of Health Psychology*. Epub ahead of print 6 November 2020. DOI: 10.1177/1359105320971697.
- Li Y, Wang Y, Jiang J, et al. (2020) Psychological distress among health professional students during the COVID-19 outbreak. *Psychological Medicine*. Epub ahead of print 11 May 2020. DOI: 10.1017/S0033291720001555.
- Liu CH and Doan SN (2020) Psychosocial stress contagion in children and families during the COVID-19 pandemic. *Clinical Pediatrics* 59(9–10): 853–855.
- Maes M, Mylle J, Delmeire L, et al. (2001) Pre- and post-disaster negative life events in relation to the incidence and severity of post-traumatic stress disorder. *Psychiatry Research* 105(1–2): 1–12.
- Miloyan B, Bienvenu OJ, Brilot B, et al. (2018) Adverse life events and the onset of anxiety disorders. *Psychiatry Research* 259: 488–492.
- Mirowsky J and Ross CE (1990) Control or defense? Depression and the sense of control over good and bad outcomes. *Journal of Health and Social Behavior* 31: 71–86.
- Monroe SM and Kelley JM (1995) Measurement of stress appraisal. In: Cohen S, Kessler RC, and Gordon LU (eds) *Measuring Stress: A Guide for Health and Social Scientists*. New York, NY: Oxford University Press, pp.122–147.
- Morelli SA, Lee IA, Arnn ME, et al. (2015) Emotional and instrumental support provision interact to predict well-being. *Emotion* 15(4): 484–493.
- National Institute of Mental Health (2018a) Anxiety disorders. Available at: <https://www.nimh.nih.gov/health/topics/anxiety-disorders/index.shtml> (accessed 23 December 2020).
- National Institute of Mental Health (2018b) Depression. Available at: <https://www.nimh.nih.gov/health/topics/depression/index.shtml> (accessed 23 December 2020).
- Nelson SK, Kushlev K and Lyubomirsky S (2014) The pains and pleasures of parenting: When, why, and how is parenthood associated with more or less well-being? *Psychological Bulletin* 140(3): 846–895.
- Odrizola-González P, Planchuelo-Gómez Á, Irurtia MJ, et al. (2020) Psychological symptoms of the outbreak of the COVID-19 confinement in Spain. *Journal of Health Psychology*. Epub ahead of print 30 October 2020. DOI: 10.1177/1359105320967086.
- Park S-M, Cho S and Moon S-S (2010) Factors associated with suicidal ideation: Role of emotional and instrumental support. *Journal of Psychosomatic Research* 69(4): 389–397.
- Patrick SW, Henkhaus LE, Zickafoose JS, et al. (2020) Well-being of parents and children during the COVID-19 pandemic: A national survey. *Pediatrics* 146(4): e2020016824.
- Penninx BW, van Tilburg T, Boeke AJ, et al. (1998) Effects of social support and personal coping resources on depressive symptoms: Different for various chronic diseases? *Health Psychology* 17(6): 551–558.
- Serido J, Almeida DM and Wethington E (2004) Chronic stressors and daily hassles: Unique and interactive relationships with psychological distress. *Journal of Health and Social Behavior* 45: 17–33.
- Shanahan L, Steinhoff A, Bechtiger L, et al. (2020) Emotional distress in young adults during the COVID-19 pandemic: Evidence of risk and resilience from a longitudinal cohort study. *Psychological Medicine*. Epub ahead of print 23 June 2020. DOI: 10.1017/S003329172000241X.
- Sherbourne CD and Stewart AL (1991) The MOS social support survey. *Social Science & Medicine* 32(6): 705–714.

- Somma A, Gialdi G, Frau C, et al. (2020) COVID-19 pandemic preventive behaviors and causal beliefs among Italian community dwelling adults. *Journal of Health Psychology*. Epub ahead of print 13 October 2020. DOI: 10.1177/1359105320962243.
- Spitzer RL, Kroenke K, Williams JB, et al. (2006) A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine* 166(10): 1092–1097.
- Tennant C (2002) Life events, stress and depression: A review of recent findings. *Australian & New Zealand Journal of Psychiatry* 36(2): 173–182.
- Weinberger M, Hiner SL and Tierney WM (1987) In support of hassles as a measure of stress in predicting health outcomes. *Journal of Behavioral Medicine* 10(1): 19–30.
- Xu J, Wang Y and Tang W (2018) Posttraumatic stress disorder in Longmenshan adolescents at three years after the 2013 Lushan earthquake. *General Hospital Psychiatry* 54: 45–51.
- Yıldırım M and Arslan G (2020) Exploring the associations between resilience, dispositional hope, preventive behaviours, subjective well-being, and psychological health among adults during early stage of COVID-19. *Current Psychology*. Epub ahead of print 14 November 2020. DOI: 10.1007/s12144-020-01177-2.
- Zou P, Sun L, Yang W, et al. (2018) Associations between negative life events and anxiety, depressive, and stress symptoms: A cross-sectional study among Chinese male senior college students. *Psychiatry Research* 270: 26–33.
- Zvolensky MJ, Kotov R, Schechter CB, et al. (2015) Post-disaster stressful life events and WTC-related posttraumatic stress, depressive symptoms, and overall functioning among responders to the World Trade Center disaster. *Journal Of Psychiatric Research* 61: 97–105.
- Zysberg L and Zisberg A (2020) Days of worry: Emotional intelligence and social support mediate worry in the COVID-19 pandemic. *Journal of Health Psychology*. Epub ahead of print 18 August 2020. DOI: 10.1177/1359105320949935.