Promoting youth mental health during the COVID-19 pandemic: A longitudinal study

Maya L. Rosen, Alexandra M. Rodman, Steven W. Kasparek, Makeda Mayes, Malila M. Freeman, Liliana J. Lengua, Andrew N. Meltzoff, Katie A. McLaughlin

1 Department of Psychology, Harvard University, Cambridge, Massachusetts, United States of America, 2 Institute for Learning & Brain Sciences, University of Washington, Seattle, Washington, United States of America, 3 Department of Psychology, University of Washington, Seattle, Washington, United States of America

* mayalrosen@fas.harvard.edu

Abstract

The COVID-19 pandemic has introduced novel stressors into the lives of youth. Identifying factors that protect against the onset of psychopathology in the face of these stressors is critical. We examine a wide range of factors that may protect youth from developing psychopathology during the pandemic. We assessed pandemic-related stressors, internalizing and externalizing psychopathology, and potential protective factors by combining two longitudinal samples of children and adolescents (N = 224, 7–10 and 13–15 years) assessed prior to the pandemic, during the stay-at-home orders, and six months later. We evaluated how family behaviors during the stay-at-home orders were related to changes in psychopathology during the pandemic, identified factors that moderate the association of pandemic-related stressors with psychopathology, and determined whether associations varied by age. Internalizing and externalizing psychopathology increased substantially during the pandemic. Higher exposure to pandemic-related stressors was associated with increases in internalizing and externalizing symptoms early in the pandemic and six months later. Having a structured routine, less passive screen time, lower exposure to news media about the pandemic, and to a lesser extent more time in nature and getting adequate sleep were associated with reduced psychopathology. The association between pandemic-related stressors and psychopathology was reduced for youths with limited passive screen time and was absent for children, but not adolescents, with lower news media consumption related to the pandemic. We provide insight into simple, practical steps families can take to promote resilience against mental health problems in youth during the COVID-19 pandemic and protect against psychopathology following pandemic-related stressors.

Introduction

The COVID-19 pandemic has introduced unprecedented changes in the lives of children and adolescents. These changes brought a sudden loss of structure, routine, and sense of control. Families faced unique stressors ranging from unexpected illness, sudden unemployment and
financial stressors, difficulty accessing basic necessities, and increased caretaking responsibilities paired with the shift to remote work, among others [1, 2]. Social distancing guidelines have limited youth’s contact with friends, extended family, and teachers, which may increase isolation and loneliness. Schools traditionally provide resources that may buffer youth against the negative consequences of stressors—including supportive social interactions, physical exercise, consistent meals, and a structured routine—that were unavailable to many U.S. youth for a prolonged period of time during the pandemic. These disruptions and pandemic-related stressors are likely to increase risk for depression, anxiety, and behavior problems in youth. Here, we identify factors that may protect against increases in mental health problems during the COVID-19 pandemic in a longitudinal sample assessed both prior to the pandemic and during the stay-at-home order period. We focus on simple and practical strategies that families can take in an effort to promote positive mental health outcomes in children and adolescents during the pandemic.

Exposure to stressors is strongly related to the onset of internalizing and externalizing psychopathology in children and adolescents [3–8]. The powerful association between stress and psychopathology has been replicated in longitudinal studies [7, 9, 10], including following community stressors, such as natural disasters [11, 12] and terrorist attacks [13–15]. Numerous pandemic-related experiences reflect novel stressors for youth and families, including unpredictability and daily routine disruptions [16, 17], unexpected loss of family members, friends, and loved ones [18], chronic exposure to information about threats to well-being and survival in situations that were previously safe [19], and social isolation [20]. Thus, exposure to pandemic-related stressors is likely to be associated with increases in anxiety, depression, and behavior problems in children and adolescents [1, 21, 22]. Indeed, emerging data demonstrates that youth psychopathology has increased during the COVID-19 pandemic [23].

Identifying factors that may promote youth well-being during the pandemic is a critical priority and has clear benefits for parents, pediatricians, and medical professionals. Leading theoretical models of resilience posit that factors that promote resilience exist across multiple levels including the individual, family, school, community, and broader cultural systems [24–26]. Critically, during the early period of the COVID-19 pandemic when schools were closed, stay-at-home orders were in place, and many community resources were shuttered, children were cut off from many common sources of resilience, particularly those occurring at the school and community levels. As such, home and family-level factors may have been of even greater importance than in normal circumstances. Furthermore, given the constraints faced by many families with children, we focus on a set of simple and practical strategies that are easily accessible, inexpensive, and require no specialized resources or services outside the home. We selected factors that have previously been associated with reduced child psychopathology or buffer against mental health problems following exposure to stressors, including: higher levels of physical activity [27–29]; access to nature and the outdoors [30–33]; a consistent daily routine providing structure and predictability [16, 34]; getting a sufficient amount of sleep, which is often disrupted following stressors [35–37]; and lower levels of passive screen time and news media consumption, given that higher use has been associated with elevations in child psychopathology [38], particularly following community-level stressors, like terrorist attacks [39–42]. We also assessed the degree to which youth engaged in adaptive coping strategies during times of distress (e.g., exercising, seeking support from loved ones, or practicing mindfulness or meditation) [43–45]. Finally, providing help for others in need is associated with reduced anxiety and depression [46, 47]. Here, we evaluated whether these nine simple and inexpensive strategies are (a) associated with reduced psychopathology symptoms during the pandemic and (b) buffer against the negative mental health consequences of pandemic-related stressors in children and adolescents.
We examined these questions by combining two longitudinal samples of children and adolescents whose mental health was assessed prior to the COVID-19 pandemic in Seattle, Washington. This aspect of this study is critical because one of the strongest predictors of psychopathology during the pandemic is likely to be psychopathology prior to the pandemic. By controlling for pre-pandemic psychopathology, we are able to investigate changes in psychopathology that occurred during the pandemic. We then assessed pandemic-related stressors, internalizing and externalizing symptoms, and potential protective factors during six weeks between April and May of 2020—a period when the Seattle area was particularly hard-hit by the pandemic and stay-at-home orders were in place. We also followed up with participants six months later, between late November of 2020 and early January of 2021, to assess mental health. During this second follow-up, schools in the Seattle area were still operating virtually, social distancing guidelines were still in place, and new COVID-19 cases had reached a second peak. We examined whether exposure to pandemic-related stressors were associated with increases in internalizing and externalizing psychopathology, both concurrently and prospectively, controlling for pre-pandemic symptoms. We explored whether the potential protective factors were associated with changes in psychopathology during the pandemic or moderated the association of pandemic-related stressors with changes in psychopathology both during the stay-at-home orders and six months later. Finally, we tested whether these associations varied as a function of age, to determine whether the associations of potentially protective factors with psychopathology were similar for children and adolescents both concurrently and prospectively. Given the unique context of the COVID-19 pandemic, we did not have strong hypotheses about which particular protective factors would be more beneficial to children or adolescents. However, we did hypothesize that adolescents would show a stronger association between pandemic-related stress and psychopathology given previous work that shows that adolescence is a period of particular vulnerability to mental health problems following stressful life events [6, 7, 48–50].

Methods
Participants
Participants were recruited from two ongoing longitudinal studies of children and adolescents in the greater Seattle area. A sample of 224 youth aged 7–15 (\(M_{age} = 12.65, SD = 2.59\), range: 7.64–15.24, 47.8% female) and a caregiver completed a battery of questionnaires to assess social behaviors and experiences and pandemic-related stressors. Participants also completed assessments of symptoms of internalizing and externalizing psychopathology. Two participants did not complete these mental health assessments and therefore were excluded from analyses. Six months later, 184 of these youth (82% of the initial pandemic sample) and a caregiver again completed an assessment of internalizing and externalizing symptoms. Ten participants did not complete these mental health assessments and therefore were excluded from analyses at T2. The racial and ethnic background of participants reflected the Seattle area, with 66% of participants identifying as White, 11% as Black, 11% as Asian, 8% as Hispanic or Latino, and 3% as another race or ethnicity.

Children from the first sample were recruited from a study of younger children \(N = 99\) originally recruited between January 2016 and September 2017 [51, 52]. Between March 2018 and November 2018, a subset of the original sample \(N = 90\) participated in a follow-up assessment of mental health. All participants who participated at baseline were contacted for the current study during the period of stay-at-home orders of the pandemic. From this sample, 68 youths (68.9% of the original sample; \(M_{age} = 8.88\), range: 7.64–10.21, 53% female) and a caregiver participated in the first time point of current study (during the stay-at-home orders) and
53 completed the six-month follow-up. Mental health assessments obtained at age 6–8 years were used to control for pre-pandemic psychopathology. Three participants did not complete the most recent assessment, and mental health assessments at age 5–6 were used to control for pre-pandemic psychopathology.

Adolescent participants were drawn from a longitudinal study of children followed from early childhood to adolescence and their mothers [53]. Participants completed the most recent assessment at age 11–12 years (N = 227) between June 2017 and October 2018. These participants were re-contacted for assessment for the current study. From this sample, 154 youths (M_{age} = 14.3, range: 13.12–15.24, 46% female) and their caregiver completed the current study (67.8% of the most recently assessed sample) and 121 completed the six-month follow-up. Mental health assessments at age 11–12 were used to control for pre-pandemic psychopathology.

These two samples came from the same general population (youth in the Seattle area from a wide range of socioeconomic backgrounds). Critically, these two samples did not differ with regards to socioeconomic status, as measured by the income-to-needs ratio, sex distribution (ps > .8), or in exposure to pandemic-related stressors (p = .907).

Participants were excluded from the parent studies based on the following criteria: IQ < 80, active substance dependence, psychosis, presence of pervasive developmental disorders (e.g., autism), and psychotropic medication use. Across both samples, legal guardians provided informed consent and youths provided assent via electronic signature obtained using Qualtrics (Provo, UT). All study procedures were approved by the Institutional Review Board at Harvard University. Youth and their caregivers were each paid $50 for participating in the first wave of the study and $35 for the second wave.

Procedure

Parents and youth separately completed electronic surveys. Families contacted an experimenter if youth had trouble completing the surveys on their own, and an experimenter then called via phone or video chat and read the questions aloud and recorded their responses (this experimenter was blind to all data from the previous assessments). Data were collected during a six-week period between mid-April, 2020 and May 31st, 2020 (T1), during which schools were closed and stay-at-home orders were in place. A follow-up (T2) was conducted between late November 2020 and early January 2021 in which youth mental health was assessed again.

Pandemic-related stressors

We developed a set of questions to assess pandemic-related stressors (https://osf.io/drqku/; see S1 File). The assessment included health, financial, social, school, and physical environment stressors that occurred within the preceding month, based on both caregiver and child report (See Table 1). Given that the COVID-19 pandemic presented a wide range of unique stressors that have not occurred in prior community-wide disruptions, it was necessary to create a novel measure to assess these types of experiences. It is standard practice in the field to do so when novel events occur for which existing stress measures do not adequately capture the full extent of specific types of stressful experiences (e.g., to understand the unique hurricane-related stressors that occurred during Hurricane Katrina or experiences specific to the terrorist attacks on September 11th or the Oklahoma City bombing [12, 41, 54, 55].

We created a composite of pandemic-related stressors using a cumulative risk approach, [56] by determining the presence of each potential stressors (exposed versus not exposed), and creating a risk score reflecting a count of these stressors (18 maximum). Importantly, many previous studies demonstrate the utility and convergent validity of cumulative stress measures
Table 1. COVID-19 pandemic-related stressors and potential protective factors.

| Stressor Domain     | Description                                                                 | Number of Items |
|---------------------|-----------------------------------------------------------------------------|-----------------|
| Health Stressors    | Participant contracted COVID-19; a parent, sibling or another relative contracted COVID-19; a partner or close friend contracted COVID-19; the participant knew someone who died of the virus; had a parent who was an essential worker (e.g. healthcare worker, grocery store worker) who was still working during the initial months of the pandemic. | 7               |
| Social              | having a difficult relationship with a parent or other member of the household that had gotten worse during the last month; experiencing loneliness a few times per week or more; and experiencing racism, prejudice or discrimination related to the pandemic. | 4               |
| Financial           | a parent was laid off or had other significant loss of employment; the family experienced food insecurity, assessed using previously-validated items [81, 82]; the family was evicted or otherwise were forced to leave their home because of financial reasons; the family experienced significant financial loss (e.g. due do loss of business, job loss, stock market losses, etc.). | 4               |
| School              | experiencing difficulty getting schoolwork done at home; the environment where the child does schoolwork is noisy. | 2               |
| Physical Environment| crowding in the home based on the total number of people in the home divided by the approximate square footage reported by the parent [32] | 1               |

| Potential Protective Factor | Description of Measurement |
|-----------------------------|-----------------------------|
| Physical Activity           | Total minutes of physical activity per week |
| Time in Nature              | Days per week they spent time in natural green spaces including parks, canals, nature areas, beaches, countryside, and farmland. |
| Time Outdoors               | Days per week participants spend time outside of their home (e.g. backyard or neighborhood street) for at least 30 minutes |
| News Consumption            | Time spent watching news coverage about the pandemic on a TV, computer, iPad or other electronic device per day. Scored as a binary variable with less than 2 hours per day being scored as 0, and 2 or more hours per day being scored as 1. |
| Passive Screen Time         | Hours per day, on average spent watching video on an electronic device, passively scrolling through social media, looking at websites and online news, watching movies and TV. Summed for total passive screen time |

(Continued)
in relation to health outcomes, with a greater number of stressors predicting higher levels of mental and physical health problems [56]. Here, we provide additional evidence for convergent validity by showing that the number of stressors is moderately associated with a measure of perceived stress as measured by the Perceived Stress Scale in this sample ($r = 0.399$). This value is similar to the correlation between stressful life events and perceived stress observed in the original validity studies used to create the Perceived Stress Scale ($r = 0.24-.35$) [57].

We also assessed pandemic-related stressors at T2. Importantly we only asked about stressors occurring between T1 and T2. If, for example, a participant had family member who became ill with COVID-19 in April 2020, this would be counted in the pandemic-related stressors at T1, but not at T2. We used pandemic-related stressors at T1 in all analyses (including prospective analyses) but report on pandemic-related stressors at T2 to illustrate the ongoing nature of the pandemic during the second wave of data collection.

### Potential protective factors

We assessed nine potentially protective aspects of youth and family behavior during the prior month: (a) physical activity, (b) time spent in nature, (c) time spent outdoors, (d) screen time, (e) news consumption, (f) sleep quantity, (g) family routines, (h) coping strategies, and (i) helping others (https://osf.io/drqku/, Table 1).

### Internalizing and externalizing psychopathology

Psychopathology was assessed prior to the pandemic by parent and child report on the Youth Self Report (YSR) and Child Behavior Checklist (CBCL) [58, 59]. The CBCL scales are widely used measures of youth emotional and behavioral problems and use normative data to generate age-standardized estimates of internalizing and externalizing psychopathology. We used the highest T-scores from the caregiver or child on the Internalizing and Externalizing symptoms subscales as measures of pre-pandemic symptoms. The children who were 6–8 years old at the pre-pandemic time point did not complete the YSR; only the CBCL was used to compute their pre-pandemic symptoms at that time point. The use of the higher caregiver or child report for psychopathology is an implementation of the standard “or” rule used in combining

| Table 1. (Continued) |
|---------------------|
| Stressor Domain     | Description                                                                 |
| Sleep Quantity      | Binary measure computed using CDC recommended guidelines for children in this age range (9–12 hours per night for children aged 8–10; 8–9 hours per night for adolescents [83].) |
| Daily Routine       | Participant report on a 4-point Likert scale about the extent to which their days had a fairly consistent routine. |
| Adaptive Coping Strategies | Binary measure. Participants were given a 1 if they endorsed any of the following ways of dealing with distress related to the coronavirus: talked to family or friends, exercised, meditated, or engaged in self-care activities. |
| Helping in Community | Binary measure. Participants were given a 1 if they endorsed having participated in any of the following activities: volunteering time at hospitals, donating or preparing food, donating money or supplies, giving shelter to displaced people, praying for others, writing letters or contacting isolated people, cheering on health care workers, or other ways of helping. |

https://doi.org/10.1371/journal.pone.0255294.t001
caregiver and child reports of psychopathology. In this approach, if either a parent or child endorses a particular symptom it is counted with the assumption that if a symptom is reported, it is likely present. This is a standard approach in the literature on child psychopathology—for example it is how mental disorders are diagnosed in population-based studies of psychopathology in children and adolescents [60, 61].

To assess psychopathology at T1 and T2, parents and youths completed the Strengths and Difficulties Questionnaire, a widely-used assessment of youth mental health [62]. The SDQ has good reliability and validity [63, 64] and correlates strongly with the CBCL/YSR [65]. We chose to use the SDQ to reduce participant burden, as it has substantially fewer items than the CBCL/YSR. We used the highest reported value on the Internalizing and Externalizing symptoms subscales from the caregiver or child.

**Family income**

At T1, we asked caregivers to report their total combined family income for the 12 months prior to the onset of the pandemic in 14 bins. The median of the income bins was used except for the lowest and highest bins which were assigned $14,570 and $150,000, respectively. We then calculated the income-to-needs ratio by dividing the family’s income by the federal poverty line for a family of that size in 2020, with values less than one indicating income below the poverty line. Nine caregivers did not provide information on family income and were thus excluded from analyses. Median income-to-needs ratio was 4.19 (min = 0.35, max = 8.41).

**Statistical analysis**

We used linear regression to investigate the questions of interest. Continuous predictors were standardized using a z-score. Analyses were performed in R using the lme4 package and standardized coefficients are presented. Continuous age, sex, income-to-needs ratio, and pre-pandemic symptoms measured using the CBCL/YSR prior to the pandemic were included as covariates in all analyses. First, we examined the association of pandemic-related stressors with internalizing and externalizing symptoms, both concurrently and prospectively. Next, we examined the association of potential protective factors with internalizing and externalizing problems, both concurrently and prospectively. Then, we tested whether these factors moderated the association of pandemic-related stressors with psychopathology, both concurrently and prospectively. Finally, we computed interactions of each protective factor with age predicting psychopathology and the interaction of pandemic-related stressors, each potential protective factor, and age predicting psychopathology, both concurrently and prospectively. Simple slopes analysis was used to follow-up on significant interactions using the R pequod package. Stratification for simple slope analyses in analyses that used continuous moderators were conducted using a median split. In the case of age analyses, because there was a gap in age between the oldest children (10 years) and the youngest adolescents (13 years), stratifying by sample for these purposes was equivalent to stratifying by a median split. False discovery rate (FDR) correction was applied at the level of hypothesis such that we corrected for comparisons at T1 and T2 (e.g., association between physical activity and internalizing psychopathology at T1 and T2). Listwise deletion was used to handle missing data at T2, excluding participants from analysis who did not complete the second follow-up during the pandemic.

**Results**

Prior to the pandemic, 71 participants (31.7% of the sample) were in the subclinical or clinical range for internalizing problems and 39 participants (17.4% of the sample) were in the subclinical or clinical range for externalizing problems. Internalizing and externalizing symptoms
increased substantially during the early phase of the pandemic. Specifically, 127 (56.7%) were in the subclinical or clinical range for internalizing problems and 126 (56.2%) were in the subclinical or clinical range for externalizing problems at the beginning of the pandemic.

See S1 File for the frequency of different domains of stressors at T1 and T2 (S1 Table in S1 File), the distribution of potential protective factors and psychopathology symptoms before and after the pandemic (S2 Table in S1 File), bivariate correlations between all study variables (S3 Table in S1 File) and associations between individual stressors and psychopathology at T1 and T2 (S4 Table in S1 File).

As expected, one of the strongest predictors of psychopathology during the pandemic was pre-pandemic psychopathology (see S3 Table in S1 File). Therefore, it is important to highlight that all analyses controlled for pre-pandemic psychopathology to assess changes in psychopathology specific to the pandemic period.

**Pandemic-related stressors and psychopathology**

The number of pandemic-related stressors was strongly associated with increases in both internalizing ($\beta = 0.345, p < .001$), and externalizing symptoms ($\beta = 0.297, p < .001$) symptoms during the pandemic, controlling for pre-pandemic symptoms (Fig 1). As expected, pre-pandemic symptoms were also strongly associated psychopathology during the pandemic in this model ($\beta = 0.279, p < .001$ and $\beta = 0.296, p < .001$ for internalizing and externalizing psychopathology, respectively).

Similarly, the number of pandemic-related stressors early in the pandemic was positively associated with internalizing ($\beta = 0.243, p = .001$) and externalizing ($\beta = 0.288, p < .001$) symptoms later in the pandemic, controlling for pre-pandemic symptoms (Fig 1). Again, pre-pandemic symptoms were strongly associated with internalizing and externalizing problems at T2 ($\beta = 0.260, p = .001$ and $\beta = 0.278, p < .001$, respectively).

The association of pandemic-related stressors with internalizing symptoms varied by age ($\beta = 0.602, p = .043$), such that the association was stronger among adolescents (simple slope: $b = 0.437, p < .001$) than children (simple slope: $b = 0.220, p = .004$) concurrently. There were interactions between age and pandemic-related stressors in predicting externalizing symptoms concurrently or prospectively.

**Potential protective factors**

Associations of potential protective factors with concurrent psychopathology and interactions with stress and age are summarized in Table 2. Associations of potential protective factors with prospective psychopathology and interactions with stress and age are summarized in Table 3.

**Physical activity.** Physical activity was unrelated to psychopathology concurrently or prospectively.

**Time spent in nature and outdoors.** Greater time spent in nature was marginally associated with lower internalizing problems both concurrently and prospectively (Fig 2A and 2B), controlling for pre-pandemic symptoms. Time spent outdoors was unrelated to psychopathology. Age did not moderate any of these associations.

**News consumption and passive screen time.** Early in the pandemic, youths who spent less time on digital devices each day had lower externalizing symptoms (Fig 2C and 2D), controlling for pre-pandemic symptoms. Consuming <2 hours of news per day was also associated with reduced externalizing symptoms early in the pandemic (Fig 2G).

The longitudinal association between screen time and internalizing symptoms varied by age (S1 Fig in S1 File), such that children showed a positive association between screen time...
and internalizing psychopathology six months later ($b = 0.572, p = 0.008$), but adolescents did not ($b = -0.074, p = 0.512$).

Age moderated the association between news consumption and internalizing psychopathology prospectively. Specifically, while children showed a positive association between news consumption and internalizing psychopathology at T2 ($b = 0.438, p = 0.015$), adolescents showed a negative association between news consumption and internalizing psychopathology at T2 ($b = -0.299, p = 0.015$).

Fig 1. Main effects of pandemic-related stressors and psychopathology. All analyses control for age, sex, income-to-needs and pre-pandemic psychopathology symptoms.

https://doi.org/10.1371/journal.pone.0255294.g001
Table 2. Associations of potential protective factors with psychopathology and interactions with stress and age at T1. Significant associations are presented in BOLD and marginal associations are presented in italics.

| Protective Factors       | Internalizing |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                         | β             | p     | β     | p     | β     | p     | β     | p     | β     | p     | β     | p     |
| Physical Activity       | -0.120        | 0.132 | -0.016| 0.900 | 0.075 | 0.826 | 0.391 | 0.243 | -0.153 | 0.191 | -0.146| 0.448 |
| Time in Nature          | -0.124        | 0.074 | 0.029 | 0.777 | 0.045 | 0.885 | 0.139 | 0.658 | -0.067 | 0.602 | 0.013 | 0.913 |
| Time Outdoors           | 0.000         | 0.999 | 0.018 | 0.779 | -0.455| 0.144 | -0.215| 0.484 | -0.088 | 0.846 | -0.238| 0.112 |
| Passive Screen Time     | 0.059         | 0.431 | 0.272 | 0.0004| -1.084| 0.074 | -0.979| 0.087 | 0.561  | 0.002 | 0.329| 0.050 |
| News Consumption        | 0.093         | 0.374 | 0.193 | 0.010 | -0.741| 0.083 | -0.312| 0.453 | 0.273  | 0.074 | 0.197 | 0.136 |
| Sleep Quantity          | -0.018        | 0.995 | -0.061| 0.370 | 0.674 | 0.130 | 0.551 | 0.126 | -0.171 | 0.326 | 0.094 | 0.762 |
| Daily Routine           | -0.022        | 0.736 | -0.122| 0.058 | -0.062| 0.854 | -0.011| 0.974 | -0.197 | 0.211 | -0.131| 0.535 |
| Adaptive Coping         | 0.061         | 0.688 | 0.124 | 0.102 | -0.436| 0.377 | -0.040| 0.906 | 0.177  | 0.276 | -0.083| 0.488 |
| Helping                 | 0.002         | 0.978 | 0.012 | 0.848 | 0.401 | 0.231 | 0.186 | 0.575 | -0.059 | 0.623 | -0.081| 0.968 |

https://doi.org/10.1371/journal.pone.0255294.t002

Table 3. Associations of potential protective factors with psychopathology and interactions with stress and age at T2. Significant associations are presented in BOLD and marginal associations are presented in italics.

| Protective Factors       | Internalizing |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                         | β             | p     | β     | p     | β     | p     | β     | p     | β     | p     | β     | p     |
| Physical Activity       | -0.049        | 0.515 | 0.009 | 0.900 | -0.126| 0.826 | 0.534 | 0.243 | -0.241 | 0.179 | 0.028 | 0.816 |
| Time in Nature          | -0.136        | 0.074 | -0.021| 0.777 | -0.264| 0.885 | 0.371 | 0.516 | 0.077  | 0.602 | 0.069 | 0.913 |
| Time Outdoors           | -0.048        | 0.999 | 0.066 | 0.750 | -0.566| 0.144 | -0.351| 0.484 | 0.029  | 0.846 | -0.163| 0.254 |
| Passive Screen Time     | 0.097         | 0.431 | 0.157 | 0.076 | -1.953| 0.030 | -1.264| 0.087 | 0.401  | 0.049 | 0.606| 0.003 |
| News Consumption        | -0.040        | 0.627 | 0.114 | 0.152 | -1.743| 0.004 | -0.932| 0.170 | 0.034  | 0.829 | 0.223| 0.136 |
| Sleep Quantity          | 0.000         | 0.995 | -0.158| 0.080 | 0.299 | 0.479 | 0.682 | 0.126 | 0.045  | 0.761 | 0.043| 0.762 |
| Daily Routine           | 0.034         | 0.736 | -0.164| 0.049 | -0.129| 0.854 | 0.589 | 0.238 | -0.191 | 0.221 | 0.092| 0.535 |
| Adaptive Coping         | -0.015        | 0.845 | 0.103 | 0.156 | -0.353| 0.377 | -0.152| 0.906 | 0.099  | 0.506 | 0.153| 0.488 |
| Helping                 | 0.036         | 0.978 | 0.026 | 0.848 | 0.835 | 0.064 | -0.237| 0.575 | -0.088 | 0.623 | -0.005| 0.968 |

https://doi.org/10.1371/journal.pone.0255294.t003
Screen time moderated the association of pandemic-related stressors with internalizing and externalizing psychopathology concurrently and prospectively (Fig 3). Specifically, youths who spent more time on screens showed a strong positive association of pandemic-related stressors with concurrent ($b = 0.513, p < .001$) and prospective ($b = .335, p < .001$) internalizing symptoms as well as both concurrent ($b = 0.285, p < .001$) and prospective ($b = .383, p < .001$) externalizing problems that was absent for youths who spent less time on screens at both time points ($b = 0.020–0.061, p = .445-.935$).

A three-way interaction was observed between news consumption, age, and pandemic-related stressors in predicting internalizing symptoms both concurrently and prospectively (Fig 4). Pandemic-related stressors were unrelated to internalizing problems concurrently ($b = -.087, p = .502$) or prospectively ($b = -.036, p = .808$) among children who consumed <2 hours of news media per day, but were strongly associated with internalizing psychopathology both concurrently ($b = 0.39 2, p < .001$) and prospectively ($b = 0.383, p < .001$) among children with >2 hours daily news consumption. Among adolescents, pandemic-related stressors were strongly associated with internalizing problems concurrently ($b = 0.409–0.452, p < .001$), regardless of news consumption. Adolescents who consumed low levels of news during the stay-at-home orders showed a positive association between pandemic-related stressors and internalizing psychopathology six months later ($b = 0.509, p = .002$), while adolescents who consumed more news did not ($b = 0.113, p = .346$).
Sleep quantity. Getting the recommended number of hours of sleep was unrelated to psychopathology concurrently. However, getting the recommended amount of sleep during the stay-at-home orders was marginally associated with lower levels of externalizing psychopathology six months later, controlling for pre-pandemic symptoms (Fig 2H). These associations did not vary by age.

Routine. Youths with a more structured daily routine had lower externalizing (Fig 2E and 2F) six months later. No associations of a structured routine were found with internalizing symptoms, and no interactions with age or stress emerged.
Coping strategies. There was no significant association between engaging in adaptive coping strategies with psychopathology concurrently or prospectively.

Fig 4. Age x stress x news interaction. Low news consumption buffers children, but not adolescents, against pandemic-related increases in internalizing psychopathology concurrently (A) and prospectively (B). All analyses control for age, sex, income-to-needs ratio, and pre-pandemic psychopathology symptoms.

https://doi.org/10.1371/journal.pone.0255294.g004
Helping others. Helping in one’s community was unrelated to psychopathology concurrently or prospectively.

Discussion
The present study identifies simple and practical behaviors that are associated with well-being among children and adolescents during the COVID-19 pandemic. Critically, this study involved a longitudinal sample of children and adolescents for which mental health had been assessed prior to the pandemic, during the stay-at-home orders, and six months later allowing us to investigate psychopathology during the pandemic while controlling for pre-pandemic symptoms. As expected, we found that youths who experienced greater pandemic-related stressors had higher levels of internalizing and externalizing psychopathology. Importantly, greater pandemic-related stressors during the stay-at-home orders were also prospectively associated with higher levels of both internalizing and externalizing psychopathology six months later. Critically, we identified several factors—including a structured daily routine, low passive screen time use, low news media consumption about the pandemic, and to a lesser extent spending more time spent in nature and getting the recommended amount of sleep—that are associated with better mental health outcomes in youth during the pandemic. We additionally demonstrate that the strong association between pandemic-related stressors and psychopathology is absent among children with lower amounts of screen time and news media consumption.

Youth who had a structured and predictable daily routine were less likely to experience increases in externalizing problems during the pandemic than youth with less structured routines. A sudden loss of routine has occurred for many families during the pandemic related to school closures, changes in parental work arrangements, and loss of access to activities outside the home for youth and adolescents. These disruptions in daily routine are associated with increased risk for behavior problems in youth during the pandemic, consistent with prior work suggesting that lack of predictability is strongly linked to youth psychopathology [16, 34, 66, 67]. Moreover, a recent paper during the pandemic showed that preschoolers in families that maintained a structured routine during the pandemic showed lower rates of depression and externalizing problems, over and above the effect of food insecurity, socioeconomic status, dual-parent status, maternal depression, and stress [68]. Our current findings extend this work by demonstrating that a structured routine may also be important for older children and adolescents. Although maintaining routine and structure is challenging as school closures continue and many aspects of daily life remain unpredictable, creating a structured daily routine for children and adolescents may promote better mental health during the pandemic.

Greater passive screen time use was associated with higher levels of externalizing psychopathology early in the pandemic, and greater passive screen time use was associated with higher internalizing psychopathology later in the pandemic for children but not adolescents. Additionally, the strong association of pandemic-related stressors with internalizing and externalizing psychopathology both concurrently and prospectively was reduced in children and adolescents with low passive screen time use. Previous studies have argued that the increases in screen time use over the last decade may be responsible for rising levels of anxiety and depression among children and adolescents [38]. However, others have suggested that greater screen time use may not have negative impacts [69, 70] and that psychopathology and digital device use have a reciprocal association with one another [71]. During the pandemic, youths were encouraged to use digital devices more than ever for school and social connection, which are likely to be beneficial for their development. Here, we measured passive use of digital devices, including watching videos on an electronic device, passively scrolling through social
media, looking at websites and online news, and watching movies and TV—excluding more active uses of digital devices for schooling and social communication. Greater research is needed to determine whether the amount of passive screen time itself has negative effects on youth mental health or whether this association simply reflects that greater time on digital devices takes time away from other important behaviors such as exercise, sleep, or connecting with friends or family. Indeed, in the present study, screen time was inversely related with sleep quantity (S3 Table in S1 File). Therefore, one reason that youths with lower screen time use may be buffered against pandemic-related increases in psychopathology is because they are engaging in other behaviors that promote well-being such as getting sufficient sleep, among others. Together, these findings suggest some potential benefits associated with limiting passive screen time among youth during the pandemic.

Our findings also suggest that limiting news consumption about the pandemic may be beneficial, particularly for younger children. Greater news media consumption about the pandemic was associated with higher levels of externalizing problem early in the pandemic. Moreover, the strong association between pandemic-related stressors and internalizing psychopathology was absent in children who consumed lower levels of news media, although pandemic-related stressors were positively associated with internalizing symptoms in adolescents regardless of news consumption concurrently. This finding is broadly consistent with previous studies observing strong associations between media exposure about community-level stressors, including terrorist attacks and natural disasters, and higher rates of psychopathology in children and adolescents [41, 42, 72–74]. Interestingly, the same pattern persisted for children six months into the pandemic, while for adolescents who consumed more news during the stay-at-home orders showed a weaker association between stress and internalizing psychopathology six months later than those who consumed less news. Therefore, it is possible that for adolescents, having more knowledge about the pandemic early on may have been beneficial over time. Together these findings suggest that limiting certain types of news media exposure may protect against pandemic-related increases in internalizing problems, especially among young children. Importantly, this does not imply that parents should refrain from discussing the pandemic or hide the realities from their children. In fact, previous studies have found that honest conversations between parents and children provide an important protection against the development of psychopathology in the wake of natural disasters [75]. Therefore, we suggest limiting sensational news media consumption, in favor of talking to children about what is happening, listening to their concerns, and answering their questions in an age-appropriate manner.

Additionally, we found weaker and only marginally significant associations between time spent in nature and getting the recommended amount of sleep with youth psychopathology during the pandemic. We briefly discuss these findings here, as they highlight additional strategies that could be beneficial to families when considering how to support the mental health of their children during the pandemic. Greater time spent in nature was marginally associated with lower increases in internalizing symptoms relative to pre-pandemic symptoms both concurrently and prospectively. These findings are broadly consistent with prior evidence that spending at least two hours in nature per week is associated with greater well-being in adults [31] and better mental health in children [76]. Additionally, the association of stressors with well-being is reduced among children with greater access to nature [77]. Encouraging youths to spend time in nature may also be beneficial for mental health during the pandemic. In addition, children and adolescents who got the recommended amount of sleep at the beginning of the pandemic showed marginally lower levels of externalizing psychopathology six months later. These findings highlight the importance of encouraging youths to get an adequate amount sleep. Given the negative association between screen time and sleep duration both
here and in prior work [78], reducing access to digital devices prior to bedtime may be one simple strategy parents can use to make it easier for their children to get an adequate amount of sleep.

Limitations

The present study has several limitations which should be acknowledged. First, we relied on self-report measures of behavior, which can be inaccurate due to recall bias. Future studies may benefit from using actigraphy to assess physical activity and sleep, geolocation to measure time spent in nature and outdoors, and direct reports of screen time use and news media consumption from digital devices for more accurate measures of potential protective factors. Second, while the longitudinal nature of the present study is a strength, it only included two snapshots of youth behavior and mental health during the pandemic. It will be important to continue to follow youths throughout the pandemic to determine factors that promote long-term risk and resilience. Third, we used a different measure of psychopathology prior to the pandemic (CBCL/YSR) than after the onset of the pandemic (SDQ). While it would have been ideal to have the same measure at all time points, the CBCL/YSR is much longer than the SDQ and we were focused on minimizing participant burden during a period of time when families were facing numerous stressors and loss of access to typical childcare options. Thus, we chose to use a shorter questionnaire that is strongly correlated with the CBCL/YSR [62, 65, 79, 80]. Relatedly, we asked questions about potential protective factors in our COVID Experiences Survey, rather than using longer validated scales for each of the factors (e.g. Pittsburgh Sleep Quality Index, Physical Activity Questionnaire for Children, Media Parenting Practices, Family Routines Inventory, German Coping Questionnaire for Children and Adolescents, etc.). This choice was made to maximize the information gained about each family, while minimizing participant burden and thus maximizing our sample size. Fourth, we combined data from two separate samples of children (aged 7–10 and 13–15 at T1). Both samples were recruited using similar methods from the same target population, and we had identical measures of prepandemic psychopathology on both samples. Moreover, the samples did not differ in demographics, SES, or exposure to pandemic-related stressors. However, using two samples with a gap in age limited our ability to understand age effects across the entire spectrum of childhood and adolescence. Fifth, we demonstrate the predictive validity of the pandemic-related stress measure via moderate associations with psychopathology at both waves as well as a measure of perceived stress. However, this cumulative risk approach is limited in that it weights stressors equally that could have variable impacts. Future work should investigate whether specific stressors have been more strongly linked to changes in mental health during the pandemic (see S4 Table in S1 File for associations of specific stressors and psychopathology at T1 and T2). Finally, the present study is correlational and we are therefore limited in our ability to make causal inferences about the factors that promote well-being during the pandemic. However, given the extensive literature about the links between these factors and youth mental health, there is little reason to expect downsides to encouraging families to engage in these types of protective behaviors with their children and adolescents during the pandemic.

Conclusions and practical implications

We identify practical and easily accessible strategies that may promote greater well-being for children and adolescents during the COVID-19 pandemic. Based on these findings, we suggest that parents encourage youth to develop a structured daily routine, limit passive screen time use, limit exposure to news media—particularly for young children, and to a lesser extent spend more time in nature, and encourage youth to get the recommended amount of sleep.
Supporting information

S1 File. Please see the S1 File for frequencies of exposures to pandemic-related stressors by domain (S1 Table), distribution of potential protective factors and psychopathology symptoms (S2 Table), bivariate correlation table of all study variables (S3 Table), associations between individual stressors and psychopathology symptoms (S4 Table), age by screen time interaction predicting internalizing symptoms (S1 Fig), and the full COVID experiences surveys (caregiver and child).

Acknowledgments

The authors would also like to acknowledge Reshma Sreekala for help with data collection and Frances Li for help with compiling surveys.

Author Contributions

Conceptualization: Maya L. Rosen, Alexandra M. Rodman, Steven W. Kasparek, Andrew N. Meltzoff, Katie A. McLaughlin.

Data curation: Steven W. Kasparek.

Formal analysis: Maya L. Rosen.

Funding acquisition: Andrew N. Meltzoff, Katie A. McLaughlin.

Methodology: Maya L. Rosen, Alexandra M. Rodman, Steven W. Kasparek, Malila M. Freeman, Andrew N. Meltzoff, Katie A. McLaughlin.

Project administration: Maya L. Rosen, Alexandra M. Rodman, Steven W. Kasparek, Makeda Mayes.

Supervision: Maya L. Rosen, Alexandra M. Rodman, Steven W. Kasparek.

Writing – original draft: Maya L. Rosen.

Writing – review & editing: Maya L. Rosen, Alexandra M. Rodman, Makeda Mayes, Malila M. Freeman, Liliana J. Lengua, Andrew N. Meltzoff, Katie A. McLaughlin.

References

1. Gruber J, Prinstein MJ, Clark LA, Rottenberg J, Abramowitz JS, Albano AM, et al. Mental health and clinical psychological science in the time of COVID-19: Challenges, opportunities, and a call to action. Am Psychol. 2020. http://doi.org/10.1037/amp0000707

2. Brown SM, Doom JR, Lechuga-Pería S, Watamura SE, Koppels T. Stress and parenting during the global COVID-19 pandemic. Child Abuse Negl. 2020; 110(Pt 2):104699. https://doi.org/10.1016/j.chiabu.2020.104699 PMID: 32859394

3. Kessler RC, Davis CG, Kendler KS. Childhood adversity and adult psychiatric disorder in the US National Comorbidity Survey. Psychol Med. 1997; 27(5):1101–19. https://doi.org/10.1017/s0033291797005988 PMID: 9300515

4. McLaughlin KA, Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. Arch Gen Psychiatry. 2012; 69(11):1151–60. https://doi.org/10.1001/archgenpsychiatry.2011.2277 PMID: 23117636

5. Hankin BL, Abela JRZ. Development of psychopathology: A vulnerability-stress perspective. Thousand Oaks: Sage; 2005.

6. Grant KE, Compas BE, Stuhlmacher AF, Thurm AE, McMahon SD, Halpert JA. Stressors and child and adolescent psychopathology: Moving from markers to mechanisms of risk. Psychol Bull. 2003; 129(3):447–66. https://doi.org/10.1037/0033-2909.129.3.447 PMID: 12784938
7. Grant KE, Compas BE, Thurm AE, McMahon SD, Gipson PY. Stressors and child and adolescent psychopathology: Measurement issues and prospective effects. J Clin Child Adolesc Psychol. 2004; 33 (2):412–25. https://doi.org/10.1207/s15374424jcp3302_23 PMID: 15136206

8. McLaughlin KA. Future directions in childhood adversity and youth psychopathology. J Clin Child Adolesc Psychol. 2010; 39(4):652–63. https://doi.org/10.1080/15374426.2010.507946 PMID: 22022629

9. Jenness JL, Peverill M, King KM, Hankin BL, McLaughlin KA. Dynamic associations between stressful life events and adolescent internalizing psychopathology in a multivariate longitudinal study. J Abnorm Psychol. 2019; 128(6):596–609. https://doi.org/10.1037/abn0000450 PMID: 31368736

10. McLaughlin KA, Hatzenbuehler ML. Mechanisms linking stressful life events and mental health problems in a prospective, community-based sample of adolescents. J Adolesc Health. 2009; 44(2):153–60. https://doi.org/10.1016/j.jadohealth.2008.06.019 PMID: 19167664

11. La Greca AM, Silverman WK, Vernberg EM, Prinstein MJ. Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. J Consult Clin Psychol. 1996; 64(4):712–23. https://doi.org/10.1037/0022-006x.64.4.712 PMID: 8803361

12. McLaughlin KA, Fairbank JA, Gruber MJ, Jones RT, Lakoma MD, Pfefferbaum B, et al. Serious emotional disturbance among youths exposed to Hurricane Katrina 2 years postdisaster. J Am Acad Child Adolesc Psychiatry. 2009; 48(11):1069–78. https://doi.org/10.1097/CHI.0b013e3181b76697 PMID: 19797983

13. Hoven CW, Duarte CS, Lucas CP, Wu P, Mandell DJ, Goodwin RD, et al. Psychopathology among New York City public school children 6 months after September 11. Arch Gen Psychiatry. 2005; 62 (5):545–52. https://doi.org/10.1001/archpsyc.62.5.545 PMID: 15687108

14. Mullett-Hume E, Anshel D, Guevara V, Cloitre M. Cumulative trauma and posttraumatic stress disorder among children exposed to the 9/11 World Trade Center attack. Am J Orthopsychiatry. 2008; 78 (1):103–8. https://doi.org/10.1037/0002-9437.78.1.103 PMID: 18444732

15. Lengua LJ, Long AC, Smith KI, Meltzoff AN. Pre-attack symptomatology and temperament as predictors of children’s responses to the September 11 terrorist attacks. J Child Psychol Psychiatry. 2005; 46 (6):631–45. https://doi.org/10.1111/j.1469-7610.2004.00378.x PMID: 15877768

16. Glynn LM, Stern HS, Howland MA, Risbrough VB, Baker DG, Nievergelt CM, et al. Measuring novel antecedents of mental illness: The Questionnaire of Unpredictability in Childhood. Neuropsychopharmacology. 2019; 44(5):876–82. https://doi.org/10.1038/s41386-018-0280-9 PMID: 30470840

17. Chorpita BF, Barlow DH. The development of anxiety: The role of control in the early environment. Psych Bull. 1998; 124(1):3–21. https://doi.org/10.1037/0033-2909.124.1.3 PMID: 9670819

18. Keyes KM, Pratt C, Galea S, McLaughlin KA, Koenen KC, Shear MK. The burden of loss: Unexpected death of a loved one and psychiatric disorders across the life course in a national study. Am J Psychiatry. 2014; 171(8):864–71. https://doi.org/10.1176/appi.ajp.2014.13081132 PMID: 24832609

19. Kendler KS, Hettema JM, Butera F, Gardner CO, Prescott CA. Life event dimensions of loss, entrapment, and danger in the prediction of onsets of major depression and generalized anxiety. Arch Gen Psychiatry. 2003; 60(8):789–96. https://doi.org/10.1001/archpsyc.60.8.789 PMID: 12912762

20. Matthews T, Danese A, Wertz J, Ambler A, Kelly M, Diver A, et al. Social isolation and mental health at primary and secondary school entry: A longitudinal cohort study. J Am Acad Child Adolesc Psychiatry. 2015; 54(3):225–32. https://doi.org/10.1016/j.jaac.2014.12.008 PMID: 25721188

21. Pfefferbaum B, North CS. Mental health and the Covid-19 pandemic. N Engl J Med. 2020; 383(6):510–2. https://doi.org/10.1056/NEJMp2008017 PMID: 32283003

22. Fegerl JM, Vitiello B, Plener PL, Clemens V. Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: A narrative review to highlight clinical and research needs in the acute phase and the long return to normality. Child Adolesc Psychiatry Ment Health. 2020; 14:20. https://doi.org/10.1186/s13034-020-00329-3 PMID: 32419840

23. Chahal R, Kirshenbaum JS, Miller JG, Ho TC, Gotlib IH. Higher executive control network coherence buffers against puberty-related increases in internalizing symptoms during the COVID-19 pandemic. Biol Psychiatry Cogn Neuroimaging. 2021; 8(1):79–88. https://doi.org/10.1016/j.bpsc.2020.08.010 PMID: 33097469

24. Masten AS. Resilience theory and research on children and families: Past, present, and promise. Journal of Family Theory and Review. 2018; 10(1):12–31.

25. Masten AS, Motti-Stefanidi F. Multisystem resilience for children and youth in disaster: Reflections in the context of COVID-19. Advers Resil Sci. 2020; 1:95–106. https://doi.org/10.1007/s42844-020-00010-w PMID: 32838305

26. Masten AS. Resilience of children in disasters: A multisystem perspective. Int J Psychol. 2021; 56(1):1–11. https://doi.org/10.1002/jip.12737 PMID: 33325580
27. Bernstein EE, McNally RJ. Acute aerobic exercise helps overcome emotion regulation deficits. Cogn Emot. 2017; 31(4):834–43. https://doi.org/10.1080/02699931.2016.1168284 PMID: 27043051

28. Bernstein EE, McNally RJ. Exercise as a buffer against difficulties with emotion regulation: A pathway to emotional wellbeing. Behav Res Ther. 2018; 109:29–36. https://doi.org/10.1016/j.brat.2018.07.010 PMID: 30081242

29. Schuch FB, Vancampfort D, Rosenbaum S, Richards J, Ward PB, Stubbs B. Exercise improves physical and psychological quality of life in people with depression: A meta-analysis including the evaluation of control group response. Psychiatry Res. 2016; 241:47–54. https://doi.org/10.1016/j.psychres.2016.04.054 PMID: 27155287

30. Maas J, Verheij RA, de Vries S, Spreeuwenberg P, Schellevis FG, Groenewegen PP. Morbidity is related to a green living environment. J Epidemiol Community Health. 2009; 63(12):967–73. https://doi.org/10.1136/jech.2008.079038 PMID: 19833605

31. White MP, Alcock I, Grellicier J, Wheeler BW, Hartig T, Warber SL, et al. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. Sci Rep. 2019; 9:7730. https://doi.org/10.1038/s41598-019-44097-3 PMID: 31197192

32. Evans GW. Child development and the physical environment. Annu Rev Psychol. 2006; 57:423–51. https://doi.org/10.1146/annurev.psych.57.102904.190057 PMID: 16318602

33. Cox DTC, Shanahan DF, Hudson HL, Fuller RA, Anderson K, Hancock S, et al. Doses of nearby nature simultaneously associated with multiple health benefits. Int J Environ Res Public Health. 2017; 14(2):172. https://doi.org/10.3390/ijerph14020172 PMID: 28208789

34. Fiese BH, Tomcho TJ, Douglas M, Josephs K, Poltrock S, Baker T. A review of 50 years of research on naturally occurring family routines and rituals: Cause for celebration? J Fam Psychol. 2002; 16(4):381–90. https://doi.org/10.1037/0893-3200.16.4.381 PMID: 12561283

35. Kim EJ, Dimsdale JE. The effect of psychosocial stress on sleep: A review of polysomnographic evidence. Behav Sleep Med. 2007; 5(4):256–78. https://doi.org/10.1080/15402000701557383 PMID: 17937582

36. Sadeh A, Gruber R. Stress and sleep in adolescence: A clinical-developmental perspective. In: Carskadon MA, editor. Adolescent sleep patterns: Biological, social, and psychological influences. Cambridge: Cambridge University Press; 2009. pp. 236–253.

37. Vidal Bustamante CM, Rodman AM, Dennison MJ, Flournoy JC, Mair P, McLaughlin KA. Within-person fluctuations in stressful life events, sleep, and anxiety and depression symptoms during adolescence: A multivariate prospective study. J Child Psychol Psychiatry. 2020; 61(10):1116–25. https://doi.org/10.1111/jcpp.13234 PMID: 32185808

38. Twenge JM, Campbell WK. Associations between screen time and lower psychological well-being among children and adolescents: Evidence from a population-based study. Prev Med Reports. 2018; 12:271–83. https://doi.org/10.1016/j.pmedr.2018.10.003 PMID: 30406005

39. Gold AL, Sheridan MA, Peverill M, Busso DS, Lamberth HK, Alves S, et al. Childhood abuse and reduced cortical thickness in brain regions involved in emotional processing. J Child Psychol Psychiatry. 2016; 57(10):1154–64. https://doi.org/10.1111/jcpp.12630 PMID: 27647051

40. Busso DS, McLaughlin KA, Sheridan MA. Media exposure and sympathetic nervous system reactivity predict PTSD symptoms after the Boston Marathon bombings. Depress Anxiety. 2014; 31(7):551–8. https://doi.org/10.1002/da.22282 PMID: 24995832

41. Bernstein EE, McNally RJ. Acute aerobic exercise helps overcome emotion regulation deficits. Cogn Emot. 2017; 31(4):834–43. https://doi.org/10.1080/02699931.2016.1168284 PMID: 27043051

42. Fairbrother G, Stuber J, Galea S, Fleischman AR, Pfefferbaum B. Posttraumatic stress reactions in New York City children after the September 11, 2001, terrorist attacks. Am J Public Health. 2003; 93(6):304–11. https://doi.org/10.1136/1537-1597-2003-003400 PMID: 14616045

43. Kallapiran K, Koo S, Kirubakaran R, Hancock K. Review: Effectiveness of mindfulness in improving mental health symptoms of children and adolescents: A meta-analysis. Child Adolesc Ment Health. 2015; 20(4):182–94. https://doi.org/10.1111/camh.12113 PMID: 32680348

44. Wegner M, Amatriain-Fernandez S, Kaulitzky A, Murillo-Rodriguez E, Machado S, Budde H. Systematic review of meta-analyses: Exercise effects on depression in children and adolescents. Front Psychiatry. 2020; 11:81. https://doi.org/10.3389/fpsyt.2020.00081 PMID: 32210847

45. Cohen S. Social relationships and health. Am Psychol. 2004; 59(8):676–84. https://doi.org/10.1037/0003-066X.59.8.676 PMID: 15554821

46. Liang J, Krause NM, Bennett JM. Social exchange and well-being: Is giving better than receiving? Psychol Aging. 2001; 16(3):511–23. https://doi.org/10.1037/0882-7974.16.3.511 PMID: 11554527
47. Doré BP, Morris RR, Burr DA, Picard RW, Ochsner KN. Helping others regulate emotion predicts increased regulation of one’s own emotions and decreased symptoms of depression. Pers Soc Psychol Bull. 2017; 43(5):729–39. https://doi.org/10.1177/0146167217695558 PMID: 28903637

48. Espejo EP, Hammen CL, Connolly NP, Brennan PA, Najman JM, Bor W. Stress sensitization and adolescent depressive severity as a function of childhood adversity: A link to anxiety disorders. J Abnorm Child Psychol. 2007; 35(2):287–299. https://doi.org/10.1007/s10802-006-9090-3 PMID: 17195949

49. Larson R, Ham M. Stress and “storm and stress” in early adolescence: The relationship of negative events with dysphoric affect. Dev Psychol. 1993; 29(1):130–140.

50. Monroe SM, Rohde P, Seeley JR, Lewinsohn PM. Life events and depression in adolescence: Relationship loss as a prospective risk factor for first onset of major depressive disorder. J Abnorm Psychol. 1999; 108(4):606–614. https://doi.org/10.1037//0021-843x.108.4.606 PMID: 10609425

51. Rosen ML, Hagen MP, Lurie LA, Miles ZE, Sheridan MA, Meltzoff AN, et al. Cognitive stimulation as a mechanism linking socioeconomic status with executive function: A longitudinal investigation. Child Dev. 2020; 91(4):e762–79. https://doi.org/10.1111/cdev.1315 PMID: 31591711

52. Rosen ML, Meltzoff AN, McLaughlin KA. Distinct aspects of the early environment contribute to associative memory, cued attention, and memory-guided attention: Implications for academic achievement. Dev Cogn Neurosci. 2019; 40:100731. https://doi.org/10.1016/j.dcn.2019.100731 PMID: 31766007

53. Lengua LJ, Moran L, Zalewski M, Ruberry E, Kiff C, Thompson S. Relations of growth in effortful control to family income, cumulative risk, and adjustment in preschool-age children. J Abnorm Child Psychol. 2015; 43(4):705–20. https://doi.org/10.1007/s10802-014-9941-2 PMID: 25253079

54. Galea S, Brewin CR, Gruber M, Jones RT, King DW, King LA, et al. Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. Arch Gen Psychiatry. 2007; 64(12):1427–1434. https://doi.org/10.1001/archpsyc.64.12.1427 PMID: 18056551

55. Evans GW, Li D, Whipple SS. Cumulative risk and child development. Psychol Bull. 2013; 139(6):1342–96. https://doi.org/10.1037/a0031808 PMID: 23566018

56. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983; 24(4):385–396. PMID: 6668417

57. Kessler RC, Avenevoli S, Costello EJ, Georgiades K, Green JG, Gruber MJ, et al. Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the National Comorbidity Survey Replication Adolescent Supplement. Arch Gen Psychiatry. 2012; 69(4):372–380. https://doi.org/10.1001/archgenpsychiatry.2011.160 PMID: 22147808

58. Menkangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, et al. Lifetime prevalence of mental disorders in U.S. adolescents: Results from the national comorbidity survey replication-adolescent supplement (NCS-A). J Am Acad Child Adolesc Psychiatry. 2010; 49(10):980–989. https://doi.org/10.1016/j.jaac.2010.05.017 PMID: 20855043

59. Goodman R. Psychometric properties of the Strengths and Difficulties Questionnaire. J Am Acad Child Adolesc Psychiatry. 2001; 40(11):1337–45. https://doi.org/10.1097/00004583-200111000-00015 PMID: 11699809

60. Dickey WC, Blumberg SJ. Revisiting the factor structure of the Strengths and Difficulties Questionnaire: United States, 2001. J Am Acad Child Adolesc Psychiatry. 2004; 43(9):1159–67. https://doi.org/10.1097/01.chi.0000132808.36708.a9 PMID: 15322420

61. Goodman A, Lamping DL, Ploubidis GB. When to use broader internalising and externalising subscales instead of the hypothesised five subscales on the Strengths and Difficulties Questionnaire (SDQ): Data from British parents, teachers and children. J Abnorm Child Psychol. 2010; 38(8):1179–91. https://doi.org/10.1007/s10802-010-9434-x PMID: 20623175

62. Goodman R. Scoring and using the Strengths and Difficulties Questionnaire and the Child Behavior Checklist: Is small beautiful? J Abnorm Child Psychol. 1999; 27(1):17–24. https://doi.org/10.1023/A:1022658222914 PMID: 10197403
66. Davis EP, Stout SA, Molet J, Vegetabile B, Glynn LM, Sandman CA, et al. Exposure to unpredictable maternal sensory signals influences cognitive development across species. Proc Natl Acad Sci. 2017; 114(39):10390–10395. https://doi.org/10.1073/pnas.1703444114 PMID: 28893979

67. Glynn LM, Baram TZ. The influence of unpredictable, fragmented parental signals on the developing brain. Frontiers in Neuroendocrinology. 2019; 53:100736. https://doi.org/10.1016/j.yfne.2019.01.002 PMID: 30711600

68. Glynn LM, Davis EP, Luby JL, Baram TZ, Sandman CA. A predictable home environment may protect child mental health during the COVID-19 pandemic. Neurobiol Stress. 2021; 14:100291. https://doi.org/10.1016/j.nystr.2020.100291 PMID: 33532520

69. Orben A. Teenagers, screens and social media: A narrative review of reviews and key studies. Soc Psychiatry Psychiatr Epidemiol. 2020; 55(4):407–14. https://doi.org/10.1007/s00127-019-01825-4 PMID: 31925481

70. Jensen M, George MJ, Russell MR, Odgers CL. Young adolescents’ digital technology use and mental health symptoms: Little evidence of longitudinal or daily linkages. Clin Psychol Sci. 2019; 7(6):1416–33. https://doi.org/10.1177/2167702619859336 PMID: 31929951

71. George MJ, Russell MA, Piontak JR, Odgers CL. Concurrent and subsequent associations between daily digital technology use and high-risk adolescents’ mental health symptoms. Child Dev. 2018; 89(1):78–88. https://doi.org/10.1177/0009928918801777 PMID: 28466466

72. Weems CF, Scott BG, Banks DM, Graham RA. Is TV traumatic for all youths? The role of preexisting posttraumatic-stress symptoms in the link between disaster coverage and stress. Psychol Sci. 2012; 23(11):1293–7. https://doi.org/10.1177/0956797612446952 PMID: 23070308

73. Ijefra laum B, Nixon SJ, Tivis RD, Doughty DE, Pynoos RS, Gurwitch RH, et al. Television exposure in children after a terrorist incident. Psychiatry. 2001; 64(3):202–11. https://doi.org/10.1521/ppsych.64.3.202.18462 PMID: 11708044

74. Comer JS, Kendall PC. Terrorism: The psychological impact on youth. Clin Psychol Sci Pract. 2007; 14(3):179–212.

75. Cobham VE, McDermott B, Haslam D, Sanders MR. The role of parents, parenting and the family environment in children’s post-disaster mental health. Curr Psychiatry Rep. 2016; 18(6):53. https://doi.org/10.1007/s11920-016-0691-4 PMID: 27086314

76. McCormick R. Does access to green space impact the mental well-being of children: A systematic review. J Pediatr Nurs. 2017; 37:3–7. https://doi.org/10.1016/j.pedn.2017.08.027 PMID: 28882650

77. Wells NM, Evans GW. Nearby nature: A buffer of life stress among rural children. Environ Behav. 2003; 35(3):311–30.

78. Twenge JM, Hiler GC, Krizan Z. Associations between screen time and sleep duration are primarily driven by portable electronic devices: evidence from a population-based study of U.S. children ages 0–17. Sleep Med. 2019; 56:211–218. https://doi.org/10.1016/j.sleep.2018.11.009 PMID: 30639033

79. Van Roy B, Veenstra M, Clerch-Aas J. Construct validity of the five-factor Strengths and Difficulties Questionnaire (SDQ) in pre-, early, and late adolescence. J Child Psychol Psychiatry. 2008;

80. Klasen H, Woerner W, Wolke D, Meyer R, Overmeyer S, Kaschnitz W, et al. Comparing the German versions of the Strengths and Difficulties Questionnaire (SDQ-Deu) and the Child Behavior Checklist. Eur Child Adolesc Psychiatry. 2000; 49(12):1304–1312.

81. McCaughlin KA, Green JG, Alegria M, Jane Costello EJ, Gruber MJ, Sampson NA, et al. Food insecurity and mental disorders in a national sample of U.S. adolescents. J Am Acad Child Adolesc Psychiatry. 2012; 51(12):1293–1303. https://doi.org/10.1097/jaac.2012.09.009 PMID: 23200286

82. Blumberg SJ, Bialostosky K, Hamilton WL, Briefel RR. The effectiveness of a short form of the Household Food Security Scale. Am J Public Health. 1999; 89(8):1231–4. https://doi.org/10.1001/ajph.89.8.1231 PMID: 10432912

83. Paruthi S, Brooks Ll, D’Ambrosio C, Hall WA, Kotagal S, Lloyd RM, et al. Recommended amount of sleep for pediatric populations: A consensus statement of the American Academy of Sleep Medicine. J Clin Sleep Med. 2016; 12(6):785–6. https://doi.org/10.5664/jcsm.5866 PMID: 27250809
## S1 Table. Frequency of exposure to pandemic-related stressors (by domain).

| Stressor Domain | Number of Stressors | Frequency (%) at T1 | Frequency (%) at T2 |
|-----------------|---------------------|---------------------|---------------------|
| Health          | 0                   | 107 (48.2%)         | 74 (40.2%)          |
|                 | 1                   | 71 (32.0%)          | 57 (31.0%)          |
|                 | 2                   | 33 (14.9%)          | 36 (19.6%)          |
|                 | 3                   | 8 (3.6%)            | 12 (6.5%)           |
|                 | 4                   | 6 (2.7%)            | 4 (2.2%)            |
|                 | 5                   | 0 (0%)              | 1 (0.5%)            |
|                 | 6                   | 0 (0%)              | 0 (0%)              |
|                 | 7                   | 0 (0%)              | 0 (0%)              |
| Financial       | 0                   | 145 (65.3%)         | 133 (72.3%)         |
|                 | 1                   | 55 (24.8%)          | 35 (19.0%)          |
|                 | 2                   | 19 (8.6%)           | 15 (8.2%)           |
|                 | 3                   | 6 (2.7%)            | 1 (0.5%)            |
|                 | 4                   | 0 (0%)              | 0 (0%)              |
| Social          | 0                   | 165 (74.3%)         | 162 (88.0%)         |
|                 | 1                   | 46 (20.7%)          | 15 (8.2%)           |
|                 | 2                   | 12 (5.4%)           | 7 (3.8%)            |
|                 | 3                   | 2 (0.9%)            | 0 (0%)              |
|                 | 4                   | 0 (0%)              | 0 (0%)              |
| School          | 0                   | 130 (58.6%)         | 126 (68.5%)         |
|                 | 1                   | 84 (37.8%)          | 58 (31.5%)          |
|                 | 2                   | 11 (5.0%)           | 0 (0%)              |
| Physical Environment | 0     | 202 (91.0%)         | 159 (86.4%)         |
|                 | 1                   | 23 (10.4%)          | 25 (13.6%)          |

A composite of pandemic-related stressors at T1 was used in all analyses. We include the number of pandemic-related stressors at T2 to illustrate the ongoing nature of the pandemic at T2.
S2 Table. Distribution of potential protective factors and psychopathology symptoms.

| Potential Protective Factor (continuous variables) | Mean (Standard Deviation) |
|---------------------------------------------------|---------------------------|
| Physical Activity (mins / week)                   | $M = 195.34$ (159.09)     |
| Time in Nature (days / week)                      | $M = 2.02$ (2.12)         |
| Days Outdoors (days / week)                       | $M = 2.97$ (2.29)         |
| Screen Time (hours)                               | $M = 7.288$ (4.95)        |
| Routine (continuous scale 1-4)                    | $M = 1.59$ (0.87)         |

| Potential Protective Factor (binary variables)     | Percentage of Participants |
|---------------------------------------------------|----------------------------|
| Consuming Less than 2 hours of News per Day       | 66.67%                     |
| Getting Recommended Amount of Sleep per Night     | 50.9%                      |
| Adaptive Coping Strategies                        | 52.2%                      |
| Helping                                           | 56.2%                      |

| Psychopathology                                   | Mean (Standard Deviation) |
|---------------------------------------------------|---------------------------|
| Baseline Internalizing (CBCL)                     | $M = 54.49$ (9.89)        |
| Baseline Externalizing (CBCL)                     | $M = 52.05$ (8.60)        |
| Internalizing T1 (SDQ)                            | $M = 5.35$ (3.51)         |
| Externalizing T1 (SDQ)                            | $M = 6.95$ (3.49)         |
| Internalizing T2 (SDQ)                            | $M = 5.51$ (3.60)         |
| Externalizing T2 (SDQ)                            | $M = 7.20$ (3.61)         |
S3 Table. Bivariate correlations between all study variables.

|            | Stress | AGE    | SES     | INT Base | EXT Base | INT T1 | EXT T1 | INT T2 | EXT T2 | Phys | Nature | Outdoor | Screen | News | Sleep | Routine | Coping |
|------------|--------|--------|---------|----------|----------|--------|--------|--------|--------|------|--------|---------|--------|------|-------|---------|--------|
| Stress     | 0.003  |        |         |          |          |        |        |        |        |      |        |         |        |      |       |         |        |
| AGE        |        | -0.161* | 0.037   |          |          |        |        |        |        |      |        |         |        |      |       |         |        |
| SES        | -0.161* | 0.037  |         |          |          |        |        |        |        |      |        |         |        |      |       |         |        |
| INT Base   | 0.165* | 0.341** |         | 0.184*   | 0.197*   |        |        |        |        |      |        |         |        |      |       |         |        |
| EXT Base   | 0.156* | 0.095  | 0.298** | 0.466**  |          |        |        |        |        |      |        |         |        |      |       |         |        |
| INT T1     | 0.413** | 0.039  | -0.126  | 0.281**  | 0.197*   |        |        |        |        |      |        |         |        |      |       |         |        |
| EXT T1     | 0.329** | -0.162* | -0.139* | 0.146*   | 0.321**  | 0.39** |        |        |        |      |        |         |        |      |       |         |        |
| INT T2     | 0.308** | 0.104  | 0.031   | 0.261**  | 0.139    | 0.615**| 0.282**|        |        |      |        |         |        |      |       |         |        |
| EXT T2     | 0.322** | -0.169* | -0.092  | 0.179*   | 0.303**  | 0.284**| 0.659**| 0.43** |        |      |        |         |        |      |       |         |        |
| Phys       | -0.103 | -0.06  | 0.121   | -0.041   | -0.163*  | 0.019  | -0.077 | 0.001  |        |      |        |         |        |      |       |         |        |
| Nature     | 0.047  | -0.156* | 0.053   | -0.055   | -0.141*  | 0.059  | -0.149 | 0.002  | 0.364**|      |        |         |        |      |       |         |        |
| Outdoor    | -0.03  | 0.248** | 0.044   | -0.111   | -0.018   | -0.062 | 0.081  | -0.085 | 0.101  | 0.392**| 0.161* |        |        |      |       |         |        |
| Screen     | 0.049  | 0.375** | -0.062  | 0.073    | 0.143*   | 0.093  | 0.18   | 0.125  | 0.032  | -0.03  | -0.024 | -0.058 |        |      |       |         |        |
| News       | 0.156* | 0.234** | -0.028  | -0.002   | -0.039   | 0.091* | 0.092  | -0.008 | 0.024  | 0.011 | 0.083  | 0.01   | 0.55** |      |       |         |        |
| Sleep      | -0.06  | 0.338** | 0.102   | -0.153*  | -0.12    | -0.023 | -0.044 | -0.02  | -0.13  | 0.081 | 0.099  | 0.075  | 0.252**| -0.15* |      |       |         |        |
| Routine    | -0.102 | -0.037 | 0.024   | -0.009   | 0.027    | -0.072 | -0.085 | -0.006 | -0.123 | 0.104 | 0.034  | -0.046 | -0.049 | -0.136 | 0.119 |      |         |        |
| Coping     | 0.057  | 0.074  | 0.063   | -0.105   | -0.14*   | 0.023  | 0.067  | -0.031 | 0.042  | 0.247**| 0.044  | 0.182* | 0.073  | 0.203* | 0.021 | -0.109 |         |        |
| Helping    | -0.098 | 0.07   | 0.101   | -0.015   | -0.008   | 0.017  | -0.026 | 0.081  | 0.014  | 0.051 | -0.006 | 0.1    | 0.035  | 0.05  | 0.126 | 0.001   | 0.2*   |

* denotes p < .05, ** denotes p < .01
S4 Table: Associations between individual stressors and psychopathology at T1 and T2, correcting for continuous age, sex, income-to-needs ratio, and psychopathology prior to the pandemic.

| Stressor                                      | Internalizing T1 | Internalizing T2 | Externalizing T1 | Externalizing T2 |
|-----------------------------------------------|------------------|------------------|------------------|------------------|
|                                               | β                | p                | β                | p                |
| Got sick with COVID-19                       | 0.279            | <.001            | 0.194            | .008             |
|                                               |                  |                  |                  |                  |
| Had a parent or sibling get sick with COVID-19| 0.160            | .013             |                  |                  |
|                                               |                  | -0.026           | 0.727            | .003             |
|                                               |                  |                  |                  | -0.014           |
| Had another relative get sick with COVID-19   |                  |                  |                  |                  |
|                                               | -0.014           | .833             | 0.516            | .032             |
|                                               |                  |                  |                  | .613             |
|                                               |                  |                  |                  | 0.064            |
|                                               |                  |                  |                  | .382             |
| Had a partner or close friend get sick with COVID-19 | 0.030            | .634             | -0.073           | 0.326            |
|                                               |                  |                  |                  | 0.027            |
|                                               |                  |                  |                  | .670             |
|                                               |                  |                  |                  | -0.001           |
|                                               |                  |                  |                  | .988             |
| Knew someone who died as a result of COVID-19| 0.024            | .708             | -0.073           | 0.328            |
|                                               |                  |                  |                  | 0.192            |
|                                               |                  |                  |                  | .002             |
|                                               |                  |                  |                  | 0.180            |
|                                               |                  |                  |                  | .012             |
| Parent is a frontline worker (healthcare)     | 0.048            | .456             | -0.038           | 0.611            |
|                                               |                  |                  |                  | -0.007           |
|                                               |                  |                  |                  | .918             |
|                                               |                  |                  |                  | -0.065           |
|                                               |                  |                  |                  | .373             |
| Parent is frontline worker (e.g. grocery)    | 0.025            | .700             | 0.089            | 0.229            |
|                                               |                  |                  |                  | 0.067            |
|                                               |                  |                  |                  | .288             |
|                                               |                  |                  |                  | 0.039            |
|                                               |                  |                  |                  | .593             |
| Felt lonely often                             | 0.357            | <.001            | 0.297            | <.001            |
|                                               |                  |                  |                  | 0.263            |
|                                               |                  |                  |                  | <.001            |
|                                               |                  |                  |                  | 0.220            |
|                                               |                  |                  |                  | .003             |
| Experienced discrimination related to the pandemic | 0.103            | .104             | 0.136            | .068             |
|                                               |                  |                  |                  | 0.034            |
|                                               |                  |                  |                  | .593             |
|                                               |                  |                  |                  | 0.068            |
|                                               |                  |                  |                  | .346             |
| Difficult relationship with a parent that has gotten worse during the pandemic | 0.199            | .002             | 0.184            | .015             |
|                                               |                  |                  |                  | 0.167            |
|                                               |                  |                  |                  | .009             |
|                                               |                  |                  |                  | 0.098            |
|                                               |                  |                  |                  | .179             |
| Difficult relationship with someone else in the | 0.160            | .012             | 0.086            | .251             |
|                                               |                  |                  |                  | 0.165            |
|                                               |                  |                  |                  | .009             |
|                                               |                  |                  |                  | 0.037            |
|                                               |                  |                  |                  | .603             |
| Experience                                      | Literature | 0.019 | .783 | 0.073 | .381 | -0.087 | .206 | 0.113 | .161 |
|------------------------------------------------|------------|-------|------|-------|------|---------|------|-------|------|
| Experienced food insecurity during the pandemic|            | 0.075 | .258 | 0.014 | .862 | 0.043   | .502 | 0.066 | .372 |
| Parent lost a job during the pandemic           |            | 0.068 | .302 | 0.067 | .381 | 0.052   | .423 | 0.077 | 0.014 |
| Significant financial losses due to the pandemic|            | 0.274 | <.001| 0.158 | .033 | 0.383   | <.001| 0.269 | 0.001 |
| Difficulty doing school work remotely           |            | -0.005| .935 | 0.116 | .125 | 0.038   | .560 | -0.001| .992 |
| Noisy school work environment                    |            | 0.014 | .838 | 0.100 | .194 | -0.018  | .788 | 0.124 | 0.098 |

Significant associations are in bold and marginal associations are in italics.
S1 Fig. Age x Screen time interaction predicting internalizing symptoms.

A binary variable for children (7-10 years) and adolescents (13-15 years) was used for the simple slopes analysis and for visualization purposes. All analyses control for age, sex, and pre-pandemic psychopathology symptoms.
The COVID-19 Experience Survey

Thank you for agreeing to participate in this research. This survey asks about your experiences related to the COVID-19 outbreak during the period of March 2020 and the resulting shelter-in-place orders that may have occurred in your community. Questions ask about how you and those close to you have been impacted in the areas of health, finances, and social and emotional functioning.

YOUR ANSWERS WILL BE KEPT STRICTLY CONFIDENTIAL.

The survey takes about 60 minutes. You may skip any questions you prefer not to answer. To thank you for your time, you will receive $50 via your choice of Venmo, Paypal or Gift Card when you are finished.

We are conducting this research to better understand how stressful experiences impact families. There are no direct benefits to you from participating in this research and there are few foreseeable risks associated with completing the survey. Your participation in this survey is completely voluntary. You do not need to complete the survey if you do not want to. Your choice whether or not to participate will not affect your current or future dealings with University of Washington or Harvard University. If you choose to complete the survey, you are free to stop the survey at any time.

First, we’re going to ask you some questions about how things were **before** the coronavirus:

1. Before the outbreak, were you employed?
   a. Yes
   b. No
2. [If 1a]: What was your occupation?
   a. [Fill]
3. Before the outbreak, did you live with a partner?
   a. Yes
   b. No
4. [If 3a]: Was your partner employed?
   a. Yes
   b. No
5. [If 4a]: What was their occupation?
   a. [Fill]
6. Which of these categories best describes your total combined family income for the 12 months **before** the outbreak? This should include income (before taxes) from all sources, wages, rents from properties, social security, disability and/or veteran's
benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.

a. $14,570 or less
b. $14,571 – $18,310
c. $18,311 – $22,050
d. $22,051 – $25,790
e. $25,791 – $29,530
f. $29,531 – $33,270
g. $33,271 – $37,010
h. $37,011 – $39,200
i. $39,201 – $48,200
j. $48,201 – $58,400
k. $58,401 – $75,000
l. $75,001 – $100,000
m. $100,001 – $150,000
n. $150,001 – $100,000

7. Before the outbreak, were you ever hungry but did not eat because you could not afford to buy food?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

8. Did you ever eat less than you felt you should because you didn't have money to buy food?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

9. How often did you not have enough money to buy food?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

10. How often could you not afford to eat balanced meals?
    a. Never
    b. Rarely
    c. Sometimes
    d. Often

11. How often could you not afford to pay your rent or mortgage?
12. How often could you not afford to pay for your utilities?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

13. Before the outbreak, how many individuals were living with you in your home?
   a. Number of adults: [Fill]
   b. Number of children: [Fill]

14. Before the outbreak, how many hours a day did you typically spend passively scrolling through social media?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

15. How many hours a day did you typically spend passively browsing other non-news websites?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

16. How many hours a day did you typically spend watching movies or shows for leisure?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

17. How many hours a day did you typically spend reading books or magazines for leisure?
   a. None
   b. 1 hour or less
c. 1-2 hours  
d. 2-4 hours  
e. 4-6 hours  
f. 6 or more hours  

18. Before the coronavirus outbreak, how many hours a day did you typically spend actively socializing with people not in your household?  
   a. None  
   b. 1 hour or less  
   c. 1-2 hours  
   d. 2-4 hours  
   e. 4-6 hours  
   f. 6 or more hours  

19. [If 18b-f]: Rank most commonly used methods of communication:  
   a. Social media apps  
   b. Texting  
   c. Phone calls  
   d. Video-chatting  
   e. In-person  

20. How many hours a day did you typically spend socializing with people who were in your household?  
   a. None  
   b. 1 hour or less  
   c. 1-2 hours  
   d. 2-4 hours  
   e. 4-6 hours  
   f. 6 or more hours  

21. [If 20b-f]: Rank most commonly used methods of communication:  
   a. Social media apps  
   b. Texting  
   c. Phone calls  
   d. Video-chatting  
   e. In-person  

22. Before the coronavirus outbreak, were you a primary caretaker of individuals in your home?  
   a. Yes  
   b. No  

23. [If 22a]: What is their relationship to you?  
   a. Parent  
   b. Child(ren)  
   c. Partner
24. Before the coronavirus outbreak, what did you typically do for physical exercise?
   a. Biking
   b. Running
   c. Dance
   d. Organized sport
   e. Swimming
   f. Yoga or pilates
   g. Aerobics or other cardio
   h. Other: [Fill in]
   i. I did not engage in physical exercise

25. [If selected 24a-h]: On average, how often did you exercise?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

26. [If selected 24a-h]: On average, how long did you typically exercise for?
   a. Less than 30 minutes
   b. 30-60 minutes
   c. 60-90 minutes
   d. 90+ minutes

27. Before the coronavirus outbreak, how often did you spend time in outdoors green spaces (e.g., open spaces including parks, canals, nature areas, coastal or beach front, countryside, farmland)?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

28. How often did you spend time outside your home for at least 30 minutes not including outdoor green spaces listed above (e.g., back yard, neighborhood street)?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

29. On an average night, how well did you sleep before the coronavirus outbreak? My sleep quality was:
   a. Not good
b. Somewhat good
c. Mostly good
d. Very good

30. On an average night, how many hours did you sleep?
a. [fill] hours

31. If you experienced trouble sleeping, was it because of: (check all that apply or leave blank if no trouble sleeping):
a. Trouble falling asleep
b. Waking up during the night
c. Waking up earlier than you wanted to

32. Before the coronavirus outbreak, did your days have a fairly consistent routine?
a. Not at all, every day was different
b. Somewhat, I did some things at the same time every day
c. Mostly, I did most things at the same time every day
d. Very much, I did everything at the same time every day

33. Did family members really help and support each other?
a. Not at all
b. Somewhat
c. Mostly
d. Very much

34. Was there was a feeling of togetherness in your family?
a. Not at all
b. Somewhat
c. Mostly
d. Very much

35. Did family members rarely criticize each other?
a. Not at all
b. Somewhat
c. Mostly
d. Very much

Now we’re going to ask you some questions about how things have been since the coronavirus pandemic started. **Specifically, we are interested in how things have been going in the past month.**

36. Do you believe you got sick with the coronavirus?
a. No
b. Possibly
c. Yes

37. [If 36 b-c]: Did you get tested for the coronavirus?
a. Did not want to get tested
b. Wanted to get tested, but was unable
c. Took a test and was positive
d. Took a test and was negative

38. [If 36 b-c]: Did you experience symptoms?
   a. Yes
   b. No

39. [If 38 a]: For how long did you experience symptoms?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

40. [If 36b-c]: Were you quarantined as a result?
   a. Yes
   b. No

41. [If 40 a]: For how long were you quarantined?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

42. [If 36b-c]: Were you hospitalized? If so, for how long?
   a. Yes
   b. No

43. [If 42a]: For how long were you hospitalized?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

44. Do you know anybody who has gotten sick with the coronavirus? If so, who? (Check all that apply)
   a. No one I know has gotten the coronavirus
   b. Child
   c. Parent
   d. Sibling
   e. Other relative (describe)
   f. Boyfriend/girlfriend/partner
   g. Close friend
   h. Coworker
i. Acquaintance
j. Other (describe)

45. [If 44b]: How serious was it for your child?
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

46. [If 44c]: How serious was it for your parent?
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

47. [If 44d]: How serious was it for your sibling? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

48. [If 44e]: How serious was it for your other relative? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

49. [If 44f]: How serious was it for your boyfriend/girlfriend/partner?
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

50. [If 44g]: How serious was it for your close friend? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

51. [If 44h]: How serious was it for your coworker? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
d. Severe symptoms (required hospitalization)

52. [If 44i]: How serious was it for your acquaintance? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

53. [If 44j]: How serious was it for your [other fill in]? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

54. [If 44b-j]: Do you know anybody who has died as a result of the coronavirus? If so, what is this person’s relationship to you? (Check all that apply)
   a. No
   b. Child
   c. Parent
   d. Sibling
   e. Other relative (describe)
   f. Boyfriend/girlfriend/partner
   g. Close friend
   h. Coworker
   i. Acquaintance
   j. Other (describe)

55. Has your employment status changed?
   a. Yes
   b. No

56. [If 55 a]: How has your employment status changed?
   a. Gained employment
   b. Laid off
   c. Reduced hours
   d. Remote work
   e. Went out of business
   f. Other: [FILL IN]

57. [If 55 a] How long have you been experiencing any of the above changes in employment? [For each 56a-f selected above]:
   a. Less than 1 week
   b. 1-2 weeks
   c. 2-3 weeks
d. 3-4 weeks  
  e. 1-2 months  
  f. 2-3 months  
  g. 3 or more months  

58. Are you able to work from home?  
   a. Yes  
   b. No  

59. Are you currently living with a partner?  
   a. Yes  
   b. No  

60. Did their employment status change?  
   a. Yes  
   b. No  

61. [If 60a]: How has their employment status changed?  
   a. Gained employment  
   b. Laid off  
   c. Reduced hours  
   d. Remote work  
   e. Went out of business  
   f. Other: [FILL IN]  

62. [If 60a] How long have you been experiencing any of the above changes in employment? [For each 61a-f selected above]:  
   a. Less than 1 week  
   b. 1-2 weeks  
   c. 2-3 weeks  
   d. 3-4 weeks  
   e. 1-2 months  
   f. 2-3 months  
   g. 3 or more months  

63. Is your partner able to work from home?  
   a. Yes  
   b. No  

64. Did you and/or your partner experience significant financial losses as a result of the outbreak and surrounding events?  
   a. Yes  
   b. No  

65. [If 64 a]: How extensive were these losses?  
   a. Minimal (will not require any adjustment in lifestyle or future planning and goals)
b. Moderate (will require major lifestyle changes and some minor adjustments in future planning and goals)

  c. Severe (will require major lifestyle changes, future planning and goals are at risk)

  d. Devastating (complete loss of financial assets, will require continued or soliciting dependence on others or government)

66. [If 64 a]: What were these financial losses due to (check all that apply)?

  a. Stock market losses

  b. Loss of business

  c. Work hours reduced

  d. Loss of employment

  e. Other: [fill in]

67. Have you had to terminate an employee either at work or in your home (e.g., nanny, housekeeper) as a result of financial losses due to the coronavirus?

  a. Yes

  b. No

68. In the last month, have you been evicted or otherwise forced to leave your home because of financial reasons?

  a. Yes

  b. No

69. Please provide the following information about your current home:

  a. Number of bedrooms [FILL IN]

  b. Number of bathrooms [FILL IN]

  c. Square-footage (approximate) [FILL IN]

70. In the last month, how many individuals were living with you in your home?

  a. Number of adults: [Fill]

  b. Number of children: [Fill]

71. In the past month, have you been a primary caretaker of individuals in your home?

  a. Yes

  b. No

72. [If 71a]: What is their relationship to you?

  a. Parent

  b. Child(ren)

  c. Partner

  d. Other [Fill]

73. Do you have a serious physical or mental illness?

  a. Physical

  b. Mental

  c. No

74. [If 74a-b]: Have there been disruptions in needed medical care due to the outbreak?
75. Does someone else in the household have a serious physical or mental illness?
   a. Physical
   b. Mental
   c. No

76. [If 75a-b]: Have there been disruptions in needed medical care for that person due to the outbreak?
   a. Yes
   b. No

77. Do you have reliable internet access?
   a. Not at all
   b. A little
   c. Somewhat
   d. Very

78. Which of these categories best describes your anticipated total combined family income for the 12 months after the outbreak? This should include income (before taxes) from all sources, wages, rents from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.
   a. $14,570 or less
   b. $14,571 – $18,310
   c. $18,311 – $22,050
   d. $22,051 – $25,790
   e. $25,791 – $29,530
   f. $29,531 – $33,270
   g. $33,271 – $37,010
   h. $37,011 – $39,200
   i. $39,201 – $48,200
   j. $48,201 – $58,400
   k. $58,401 – $75,000
   l. $75,001 – $100,000
   m. $100,001 – $150,000
   n. $150,000 or greater
   o. N/A or Prefer Not to Answer

79. In the last month, were you ever hungry but did not eat because you could not afford to buy food?
   a. Never
   b. Rarely
   c. Sometimes
80. Did you ever eat less than you felt you should because you didn't have money to buy food?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

81. How often did you not have enough money to buy food?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

82. How often could you not afford to eat balanced meals?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

83. How often could you not afford to pay your rent or mortgage?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

84. How often could you not afford to pay for your utilities?
   a. Never
   b. Rarely
   c. Sometimes
   d. Often

85. Are you or your partner a healthcare provider?
   a. Yes
   b. No, neither myself nor my partner are healthcare providers.

86. [If 85 a]: Have you or your partner continued to go to work since the beginning of the outbreak?
   a. Work has continued and I have continued to go to work.
   b. Work has continued and I have *not* continued to go to work.
   c. Work has not continued.

87. Do you or your partner work in a grocery store, pharmacy, or other retail establishment?
   a. Yes
   b. No
88. [If 87 a]: Have you or your partner continued to go to work since the beginning of the outbreak?
   a. Work has continued and I have continued to go to work.
   b. Work has continued and I have not continued to go to work.
   c. Work has not continued.
89. Is anyone in your household immunocompromised (e.g., weakened immune system due to other medical conditions)?
   a. Yes
   b. No
90. [If 89 a]: What is your relationship to that person?
   a. Me
   b. My partner
   c. My child(ren)
   d. My parent(s)
   e. Other: [fill in].
91. Have you been social distancing (e.g., putting at least 6 feet of physical distance between yourself and other people who do not live in your household)?
   a. Yes
   b. No
92. [If 91 a]: For how long have you been social distancing?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks
93. On average, how much have you and your family followed social distancing recommendations?
   a. We have made no changes to our behavior.
   b. We have made minor changes to reduce social contact (e.g., going out less, seeing fewer friends)
   c. We have made major changes to reduce physical social contact (e.g., not going to school / work, limiting contact with people outside our home)
   d. Completely changed (e.g., staying inside almost all the time, only going out for necessities, and keeping my physical distance from other people when we do)
94. On average, how much have members of your community followed social distancing recommendations?
   a. They have made no changes to their behavior.
   b. They have made minor changes to reduce social contact (e.g., going out less, seeing fewer friends)
c. They have made major changes to reduce physical social contact (e.g., not going to school / work, limiting contact with people outside their home)
d. Completely changed (e.g., staying inside almost all the time, only going out for necessities, and keeping their physical distance from other people when they do)

95. Is your child staying home from school?
a. Yes: school closed
b. Yes: school remained open, but I’m keeping my child home
c. No

96. When did your children begin staying home from school?
a. [DATE]

97. Do you assist your child on academic activities? May vary based on age-appropriateness.
a. Yes
b. No

98. [If 97a]: How many hours a day do you typically spend on academic activities with your child?
a. Hours [FILL]

99. [If 97a] Where did you obtain sources for academic instruction or guidance?
a. I made the materials myself
b. Child’s school
c. Family or friends
d. Organization: [Fill]

100. Does your child need to use the internet to do their school work?
a. Yes
b. No

101. Does your child have their own computer or tablet to do their schoolwork on? If so, how did they get this device?
a. Yes, they had it before the outbreak
b. Yes, we bought it after the outbreak
c. Yes, the school provided it after the outbreak
d. Yes, someone donated it after the outbreak
e. No

102. In the last month, approximately how much of the day do you typically spend watching or reading the news coverage about the outbreak through formal news sources (e.g., news channel on TV, news source webpage)?
a. None
b. 1 hour or less
c. 1-2 hours
d. 2-4 hours
e. 4-6 hours  
f. 6 or more hours

103. In the last month, approximately how much of the day do you typically spend watching or reading the news coverage about the outbreak through informal news sources (e.g., social media posts, blogs, talk shows; does not include links from social media to actual news source articles)?  
   a. None  
   b. 1 hour or less  
   c. 1-2 hours  
   d. 2-4 hours  
   e. 4-6 hours  
   f. 6 or more hours

104. In the last month, how many hours a day do you typically spend passively scrolling through social media?  
   a. None  
   b. 1 hour or less  
   c. 1-2 hours  
   d. 2-4 hours  
   e. 4-6 hours  
   f. 6 or more hours

105. How many hours a day do you typically spend passively browsing other non-news websites?  
   a. None  
   b. 1 hour or less  
   c. 1-2 hours  
   d. 2-4 hours  
   e. 4-6 hours  
   f. 6 or more hours

106. How many hours a day do you typically spend watching movies or shows for leisure?  
   a. None  
   b. 1 hour or less  
   c. 1-2 hours  
   d. 2-4 hours  
   e. 4-6 hours  
   f. 6 or more hours

107. How many hours a day do you typically spend reading books or magazines for leisure?  
   a. None  
   b. 1 hour or less
108. In the last month, how many hours a day have you been spending actively socializing either in person or digitally with people **not** in your household?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours
109. [If 104b-f:] Rank most commonly used methods of communication:
   a. Social media apps
   b. Texting
   c. Phone calls
   d. Video-chatting
   e. In-person
110. In the last month, how many hours a day have you been spending actively socializing either in person or digitally with people **who are** in your household?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours
111. [If 106b-f]: Rank most commonly used methods of communication:
   a. Social media apps
   b. Texting
   c. Phone calls
   d. Video-chatting
   e. In-person
112. In the last month, do you feel more or less connected to the following people:
   a. Close Friends
      i. Much less connected
      ii. A little less connected
      iii. The same
      iv. A little more connected
      v. Much more connected
   b. Other friends
i. Much less connected  
ii. A little less connected  
iii. The same  
iv. A little more connected  
v. Much more connected  

c. Family in household  
i. Much less connected  
ii. A little less connected  
iii. The same  
iv. A little more connected  
v. Much more connected  

d. Family not in household  
i. Much less connected  
ii. A little less connected  
iii. The same  
iv. A little more connected  
v. Much more connected  

e. Your community  
i. Much less connected  
ii. A little less connected  
iii. The same  
iv. A little more connected  
v. Much more connected  

113. In the last month, how much have you missed being with people *who do not live with you:*  

a. Close Friends  
i. Not at all  
ii. A little  
iii. Somewhat  
iv. Very  

b. Other friends  
i. Not at all  
ii. A little  
iii. Somewhat  
iv. Very  

c. Family  
i. Not at all  
ii. A little  
iii. Somewhat  
iv. Very
d. Coworkers
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

e. Community
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

114. In the last month, how often have you felt lonely?
   a. Never
   b. Once
   c. Several Times
   d. A few times a week
   e. Nearly every day

115. In the last month, what have you typically been doing for physical exercise?
   a. Biking
   b. Running
   c. Dance
   d. Organized sport
   e. Swimming
   f. Yoga or pilates
   g. Aerobics or other cardio
   h. Other: [Fill in]
   i. I have not engaged in physical exercise

116. [If selected 115a-h]: On average, how often have you exercised?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

117. [If selected 115a-h]: On average, how long have you typically exercised for?
   a. Less than 30 minutes
   b. 30-60 minutes
   c. 60-90 minutes
   d. 90+ minutes

118. In the last month, how often have you spent time in outdoors green spaces (e.g., open spaces including parks, canals, nature areas, coastal or beach front, countryside, farmland)?
119. How often have you spent time outside your home for at least 30 minutes not including outdoor green spaces listed above (e.g., back yard, neighborhood street)?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

120. In the past month, how well have you been sleeping? My sleep quality was:
   a. Not good
   b. Somewhat good
   c. Mostly good
   d. Very good

121. On an average night, how many hours do you sleep?
   a. [fill] hours

122. If you experienced trouble sleeping, was it because of (check all that apply or leave blank if no trouble sleeping):
   a. Trouble falling asleep
   b. Waking up during the night
   c. Waking up earlier than you wanted to

123. In the last month, have your days had a fairly consistent routine?
   a. Not at all, every day was different
   b. Somewhat, I did some things at the same time every day
   c. Mostly, I did most things at the same time every day
   d. Very much, I did everything at the same time every day

124. Have family members really helped and supported each other?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

125. Has there been a feeling of togetherness in your family?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

126. Have family members rarely criticized each other?
127. Have you had a discussion about the coronavirus with your child?
   a. Yes
   b. No

128. [If 127a]: How difficult did you find this conversation?
   a. Not at all difficult
   b. A little difficult
   c. Somewhat difficult
   d. Very difficult

129. Do you have a difficult relationship with someone who lives in your home? If so, who? Check all that apply.
   a. Yes- Partner
   b. Yes- Child
   c. Yes- Other [fill in]
   d. No

130. [If 129a-c]: Has being at home with this person more changed things in your relationship? [logic, appears for each relationship selected]
   a. Yes gotten worse
   b. Yes gotten better
   c. No stayed about the same

131. [If 129a-c]: How upsetting is it to be at home more often with this person?
   a. Not at all upsetting
   b. A little upsetting
   c. Somewhat upsetting
   d. Very upsetting

132. Have you or anyone in your household experienced any racism, prejudice, or discrimination (i.e., being treated unfairly because of some aspect of your identity) related to the coronavirus outbreak?
   a. No
   b. Yes
      i. [if b selected] Racial slur
      ii. [if b selected] Avoided because of my/their race or ethnicity
      iii. [if b selected] Attacked because of my/their race or ethnicity
      iv. [if b selected] Explain [Fill in]

133. How have your community leaders been discussing the coronavirus outbreak (government, religious, or otherwise)?
   a. Not at all seriously, they say it’s not a big deal
b. A little seriously, they say we just have to be a little more careful  
c. Somewhat seriously, they say we we should change a lot of our behavior  
d. Very seriously, they say that it’s very dangerous and it’s important to  
change our behavior

134. Do you trust the government or leaders of your community to take the appropriate  
steps to manage your safety?  
a. Not at all  
b. A little  
c. Somewhat  
d. Very

135. How well do you feel like you understand the current pandemic and the reasoning  
behind social distancing?  
a. Not at all  
b. A little  
c. Somewhat  
d. Very

136. For each item below, indicate **the most worried you have felt in the last month**  
using the sliding scale from ‘not at all worried’ to ‘extremely worried.’

| You would become seriously ill or die | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------------------|---|---|---|---|---|---|---|---|---|----|
| One of your children would become seriously ill or die |   |   |   |   |   |   |   |   |   |    |
| Someone else you care about would be become seriously ill or die |   |   |   |   |   |   |   |   |   |    |
| You would be unable to access care if you were sick |   |   |   |   |   |   |   |   |   |    |
| Someone you care about would be unable to access care if they got sick |
|---------------------------------------------------------------------|
| Infected items would be brought into your home                      |
| Need to disinfect items brought into your home                      |
| Your family wouldn’t be able to pay bills                          |
| Your family wouldn’t have enough money for basic needs like food and shelter |
| Your family would lose their housing                               |
| You would lose your job                                             |
| Your partner would lose their job                                   |
| Your family wouldn’t be able to get enough food                     |
| Your family wouldn’t be able to get other necessities like          |
| toilet paper and cleaning supplies | Your family wouldn’t be able to get medicine |
|-----------------------------------|--------------------------------------------|
| Someone else that you care about wouldn’t be able to pay bills |
| Someone else that you care about wouldn’t have enough money for basic needs like food and shelter |
| Someone else that you care about would lose their housing |
| Someone else that you care about would lose their job(s) |
| Someone else that you care about wouldn’t be able to get enough food |
| Someone else that you care about wouldn’t be able to get other necessities like toilet paper and cleaning |
supplies

Someone else that you care about wouldn’t be able to get medicine

Something bad would happen if you went outside

That you wouldn’t be able to perform well at work

That you made someone else sick with the coronavirus

That you or someone you know would be the victim of racism or discrimination

137. In the last month, how have you dealt with any stress or anxiety related to the coronavirus (check all that apply)?
   a. Watched/read news
   b. Tried to distract yourself
   c. Thought about all the details of the problem
   d. Talked to family or friends
   e. Exercised
   f. Meditated
g. Sought counseling from a therapist or religious leader
h. Self-care activities
   i. Explain [Fill in]
i. Other
   i. Explain [Fill in]

138. Have you done any of the following since the outbreak?
   a. Volunteered time at hospitals
   b. Donated/prepared food
   c. Donated money/supplies
   d. Gave shelter to displaced people
   e. Prayed/prayer group/prayer vigil
   f. Wrote letters or contacted isolated older people?
   g. Cheered on health care workers
   h. Other way of helping (specify _____________________)

139. Taking everything into consideration, what was the most stressful part of the coronavirus outbreak and subsequent social distancing/quarantine for you personally?
   a. [Fill in]

140. Is there anything we should know about the psychological effects of the outbreak that was not covered in this survey? If no, leave blank.
   a. [Fill in]
The COVID-19 Experience Survey

Thank you for agreeing to participate in this research. This survey asks about your experiences related to the COVID-19 outbreak during the period of March 2020 and the resulting shelter-in-place orders that may have occurred in your community. Questions ask about how you and those close to you have been impacted in the areas of health and finances, as well as social, and emotional functioning.

YOUR ANSWERS WILL BE KEPT STRICTLY CONFIDENTIAL.

The survey takes about 60 minutes. You may skip any questions you prefer not to answer. To thank you for your time, you will receive $50 via your choice of Venmo, Paypal or Gift Card when you are finished.

We are conducting this research to better understand how stressful experiences impact families. There are no direct benefits to you from participating in this research and there are few foreseeable risks associated with completing the survey. Your participation in this survey is completely voluntary. You do not need to complete the survey if you do not want to. Your choice whether or not to participate will not affect your current or future dealings with University of Washington or Harvard University. If you choose to complete the survey, you are free to stop the survey at any time.

First, we’re going to ask you some questions about how things were before the coronavirus:

1. What types of regular, organized group activities did you participate in during or outside of school? (Check all that apply)
   a. School clubs
   b. Sports / athletic activity (e.g., soccer, dance, running)
   c. Musical or artistic activities
   d. Other: [Fill]
   e. I did not participate in any

2. [If 1a]: How many days a week did you participate in school clubs?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

3. [If 1b]: How many days a week did you participate in sports / athletic activity?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

4. [If 1c]: How many days a week did you participate in musical or artistic activities?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
5. [If 1d]: How many days a week did you participate in [other filled]?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

6. Before the coronavirus outbreak, how often did you typically see your friends (aside from in class)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

7. How often did you typically talk to friends on the phone?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

8. How often did you typically text with friends?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

9. How often did you typically talk to your friends on other messaging apps (WhatsApp, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

10. How often did you typically talk to your friends on social media (SnapChat, Instagram, Facebook, etc.)?
    a. Never
    b. Less than once a week
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

11. Before the coronavirus outbreak, how often did you typically see your parents?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

12. How often did you typically talk to your parents on the phone?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

13. How often did you typically text with your parents?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

14. How often did you typically talk to your parents on other messaging apps (WhatsApp, etc.)?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

15. How often did you typically talk to your parents on social media (SnapChat, Instagram, Facebook, etc.)?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day
16. Before the coronavirus outbreak, how often did your peers leave you out of an online group activity or conversation that you really wanted to be included in (group chat, group photo, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

17. How often did a peer threaten to hurt you or beat you up using an online medium (texting, social media app, photo caption, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

18. How often did a peer tease you in a mean way saying rude things or calling you bad names using an online medium (texting, social media app, photo caption, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

19. How often did a peer try to damage your social reputation using an online medium (texting, social media app, photo caption, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

20. How often did a peer stop responding to you on an online medium (texting, social media app, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
21. How often did a peer block you using an online medium (texting, social media app, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

22. Before the coronavirus outbreak, how many hours a day did you typically spend passively scrolling through social media?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

23. How many hours a day did you typically spend passively browsing other non-news websites?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

24. How many hours a day did you typically spend watching movies or shows for leisure?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

25. How many hours a day did you typically spend reading books or magazines for leisure?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

26. Before the coronavirus outbreak, did you have an adult in your life you could turn to for emotional support?
   a. Yes
b. No

27. [If 26a]: What’s their relationship to you? (Check all that apply)
   a. Parent
   b. Other family member
   c. Family friend
   d. Neighbor
   e. Coach
   f. Teacher
   g. Other mentor: [Fill]

28. [If 26a]: Think about the person you’d turn to the most for emotional support, how often did you talk to them?
   a. Every few months
   b. Every few weeks
   c. At least once a week
   d. Multiple times a week

29. Before the coronavirus outbreak, how many hours a day did you typically spend actively socializing either in person or digitally with people not in your household?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

30. [If 29b-f]: Rank most commonly used methods of communication:
   a. Social media apps
   b. Texting
   c. Phone calls
   d. Video-chatting
   e. In-person

31. How many hours a day did you typically spend actively socializing either in person or digitally with people who are in your household?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

32. [If 31b-f]: Rank most commonly used methods of communication:
   a. Social media apps
   b. Texting
c. Phone calls
d. Video-chatting
e. In-person

33. Before the coronavirus, what did you typically do for physical exercise?
   a. Biking
   b. Running
c. Dance
d. Organized sport
e. Swimming
f. Yoga or pilates
g. Aerobics or other cardio
h. Other: [Fill in]
i. I did not engage in physical exercise

34. [If selected 33a-h]: On average, how often did you exercise?
   a. Less than 1 day a week
   b. At least 1 day a week
c. 2-3 days a week
d. 4-5 days a week
e. Every day or nearly every day

35. [If selected 33a-h]: On average, how long did you typically exercise for?
   a. Less than 30 minutes
   b. 30-60 minutes
c. 60-90 minutes
d. 90+ minutes

36. Before the coronavirus outbreak, how often did you spend time in outdoors green spaces (e.g., open spaces including parks, canals, nature areas, coastal or beach front, countryside, farmland)?
   a. Less than 1 day a week
   b. At least 1 day a week
c. 2-3 days a week
d. 4-5 days a week
e. Every day or nearly every day

37. How often did you spend time outside your home for at least 30 minutes not including outdoor green spaces listed above (e.g., back yard, neighborhood street)?
   a. Less than 1 day a week
   b. At least 1 day a week
c. 2-3 days a week
d. 4-5 days a week
e. Every day or nearly every day
38. On an average night, how well did you sleep before the coronavirus outbreak? My sleep quality was:
   a. Not good
   b. Somewhat good
   c. Mostly good
   d. Very good

39. On an average night, how many hours did you sleep?
   a. [fill] hours

40. If you experienced trouble sleeping, was it because of (check all that apply):
   a. Trouble falling asleep
   b. Waking up during the night
   c. Waking up earlier than you wanted to
   d. I have no trouble sleeping

41. Before the coronavirus outbreak, did your days have a fairly consistent routine?
   a. No at all, every day was different
   b. Somewhat, I did some things at the same time every day
   c. Mostly, I did most things at the same time every day
   d. Very much, I did everything at the same time every day

42. Did family members really help and support each other?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

43. Was there a feeling of togetherness in your family?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

44. Did family members rarely criticize each other?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

Now we’re going to ask you some questions about how things have been since the coronavirus pandemic started. **Specifically, we are interested in how things have been going over the past month.**

45. Do you believe you got sick with the coronavirus?
   a. No
b. Possibly

c. Yes

46. [If 45 b-c]: Did you get tested for the coronavirus?
   i. Did not want to get tested
   ii. Wanted to get tested, but was unable
   iii. Took a test and was positive
   iv. Took a test and was negative

47. [If 45 b-c]: Did you experience symptoms?
   a. Yes
   b. No

48. [If 47 a]: For how long did you experience symptoms?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

49. [If 45b-c]: Were you quarantined as a result?
   a. Yes
   b. No

50. [If 49 a]: For how long were you quarantined?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

51. [If 45b-c]: Were you hospitalized?
   a. Yes
   b. No

52. [If 51a]: For how long were you hospitalized?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

53. Do you know anybody who has gotten sick with the coronavirus? If so, who? (Check all that apply)
   a. No one I know has gotten the coronavirus
   b. Parent
   c. Sibling
   d. Other relative (describe)
e. Boyfriend/girlfriend/partner
f. Close friend
g. Classmate
h. Acquaintance
i. Teacher
j. Other (describe)

54. [If 53b]: How serious was it for your parent?
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

55. [If 53c]: How serious was it for your sibling? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

56. [If 53d]: How serious was it for your other relative? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

57. [If 53e]: How serious was it for your boyfriend/girlfriend/partner?
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

58. [If 53f]: How serious was it for your close friend? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

59. [If 53g]: How serious was it for your classmate? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

60. [If 53h]: How serious was it for your acquaintance? If more than one, describe the most serious.
a. Not serious (almost no symptoms)
b. Mild symptoms (low fever, mild cough)
c. Moderate symptoms (high fever, difficulty breathing)
d. Severe symptoms (required hospitalization)

61. [If 53i]: How serious was it for your teacher? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

62. [If 53j]: How serious was it for your [other fill in]? If more than one, describe the most serious.
   a. Not serious (almost no symptoms)
   b. Mild symptoms (low fever, mild cough)
   c. Moderate symptoms (high fever, difficulty breathing)
   d. Severe symptoms (required hospitalization)

63. [If 53b-j]: Do you know anybody who has died as a result of the coronavirus? If so, what is this person’s relationship to you? (Check all that apply)
   a. No
   b. Parent
   c. Sibling
   d. Other relative (describe)
   e. Boyfriend/girlfriend/partner
   f. Close friend
   g. Classmate
   h. Acquaintance
   i. Teacher
   j. Other (describe)

64. In the last month, approximately how much of the day do you typically spend watching or reading the news coverage about the outbreak through formal news sources (e.g., news channel on TV, news source webpage)?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

65. In the last month, approximately how much of the day do you typically spend watching or reading the news coverage about the outbreak through informal news sources (e.g., social media posts, blogs, talk shows; does not include links from social media to actual news source articles)?
66. Was your school closed as a result of the coronavirus?
   a. Yes
   b. No

67. [If 66a]: Approximate date:

68. [If 66a]: Are you continuing with your school work while you're at home?
   a. Yes
   b. No

69. [If 68a]: How are you continuing to do your school work?
   a. My parent is homeschooling me
   b. My teachers sent homework
   c. I’m doing my classes online

70. [If 68a]: What is the environment like when you are doing your school work?
   a. Very quiet
   b. Somewhat quiet
   c. Somewhat noisy
   d. Very noisy

71. [If 68a]: How difficult is it to get school work done?
   a. Not at all difficult
   b. A little difficult
   c. Somewhat difficulty
   d. Very difficult

72. Have you been social distancing (e.g., putting at least 6 feet of physical distance between yourself and other people who do not live in your household)?
   a. Yes
   b. No

73. [If 72a]: For how long have you been social distancing?
   a. 1-2 days
   b. 2-4 days
   c. 4-7 days
   d. 1-2 weeks
   e. More than 2 weeks

74. On average, how much have you and your family followed social distancing recommendations?
   a. We have made no changes to our behavior.
b. We have made minor changes to reduce physical social contact (e.g., going out less, seeing fewer friends)
c. We have made major changes to reduce physical social contact (e.g., not going to school / work, limiting contact with people outside our home)
d. Completely changed (e.g., staying inside almost all the time, only going out for necessities, and keeping my physical distance from other people when we do)

75. On average, how much have your peers followed social distancing recommendations?
   a. They have made no changes to their behavior.
   b. They have made minor changes to reduce physical social contact (e.g., going out less, seeing fewer friends)
   c. They have made major changes to reduce physical social contact (e.g., not going to school / work, limiting contact with people outside our home)
   d. Completely changed (e.g., staying inside almost all the time, only going out for necessities, and keeping their physical distance from other people when they do)

76. In the last month, what types of regular, organized group activities have you been participating in during or outside of school, even if remotely? (Check all that apply)
   a. School clubs
   b. Sports / athletic activity (e.g., soccer, dance, running)
   c. Musical or artistic activities
   d. Other: [Fill]
   e. I do not participate in any

77. [If 76a]: How many days a week have you been participating in school clubs?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

78. [If 76b]: How many days a week have you been participating in sports / athletic activity?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

79. [If 76c]: How many days a week have you been participating in musical or artistic activities?
   a. Less than 1 day a week
   b. At least 1 day a week
   c. 2-3 days a week
   d. 4-5 days a week
   e. Every day or nearly every day

80. [If 76d]: How many days a week have you been participating in [other filled]?
a. Less than 1 day a week  
b. At least 1 day a week  
c. 2-3 days a week  
d. 4-5 days a week  
e. Every day or nearly every day  

81. How much do you miss participating in your normal activities?  
a. Not at all  
b. A little  
c. Somewhat  
d. Very  

82. In the last month, how often have you seen your friends?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

83. How often have you been talking to friends on the phone?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

84. How often have you been texting friends?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

85. How often have you been talking to friends on other messaging apps (WhatsApp, etc.)?  
a. Never  
b. Less than once a week  
c. Once a week  
d. 2-3 times a week  
e. Once a day  
f. Multiple times a day  

86. How often have you been talking to friends on social media (SnapChat, Instagram, Facebook, etc.)?
87. In the last month, how often have you been seeing your parents?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

88. How often have you been talking to your parents on the phone?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

89. How often have you been texting with your parents?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

90. How often have you been talking to your parents on other messaging apps (WhatsApp, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

91. How often have you been talking to your parents on social media (SnapChat, Instagram, Facebook, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
e. Once a day
f. Multiple times a day

92. In the last month, how often did a peer leave you out of an online/digital group activity or conversation that you really wanted to be included in (e.g., group chat, group photo, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

93. How often did a peer threaten to hurt you or beat you up using an online/digital platform (texting, social media app, photo caption, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

94. How often did a peer tease you in a mean way saying rude things or calling you bad names using an online/digital platform (texting, social media app, photo caption, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

95. How often did a peer try to damage your social reputation using an online/digital platform (texting, social media app, photo caption, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

96. How often did a peer stop talking to you through an online/digital platform (texting, social media app, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
97. How often did a peer block you using online/digital platform (texting, social media app, etc.)?
   a. Never
   b. Less than once a week
   c. Once a week
   d. 2-3 times a week
   e. Once a day
   f. Multiple times a day

98. How many hours a day do you typically spend passively scrolling through social media?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

99. How many hours a day do you typically spend passively browsing other non-news websites?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

100. How many hours a day do you typically spend watching leisure movies or shows?
    a. None
    b. 1 hour or less
    c. 1-2 hours
    d. 2-4 hours
    e. 4-6 hours
    f. 6 or more hours

101. How many hours a day do you typically spend reading books or magazines for leisure?
     a. None
     b. 1 hour or less
     c. 1-2 hours
     d. 2-4 hours
     e. 4-6 hours
     f. 6 or more hours

102. In the last month, have you felt that you have an adult in your life you could turn to for emotional support?
103. [If 102a]: What’s their relationship to you (check all that apply)?
   a. Parent
   b. Other family member
   c. Family friend
   d. Neighbor
   e. Coach
   f. Teacher
   g. Other mentor: [Fill]

104. [If 102a]: Think about the person you’d turn to the most for emotional support, how often have you talked to them in the last month?
   a. Not at all
   b. Every few weeks
   c. At least once a week
   d. Multiple times a week

105. In the last month, how many hours a day have you been spending actively socializing either in person or digitally with people not in your household?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

106. [If 105b-f]: Rank most commonly used methods of communication:
   a. Social media apps
   b. Texting
   c. Phone calls
   d. Video-chatting
   e. In-person

107. In the last month, how many hours a day have you been spending actively socializing either in person or digitally with people who are in your household?
   a. None
   b. 1 hour or less
   c. 1-2 hours
   d. 2-4 hours
   e. 4-6 hours
   f. 6 or more hours

108. [If 107b-f]: Rank most commonly used methods of communication:
   a. Social media apps
b. Texting
c. Phone calls
d. Video-chatting
e. In-person

109. In the last month, do you feel more or less connected to the following people:

a. Close Friends
   i. Much less connected
   ii. A little less connected
   iii. The same
   iv. A little more connected
   v. Much more connected

b. Other friends
   i. Much less connected
   ii. A little less connected
   iii. The same
   iv. A little more connected
   v. Much more connected

c. Family in household
   i. Much less connected
   ii. A little less connected
   iii. The same
   iv. A little more connected
   v. Much more connected

d. Family not in household
   i. Much less connected
   ii. A little less connected
   iii. The same
   iv. A little more connected
   v. Much more connected

e. Other adult mentors
   i. Much less connected
   ii. A little less connected
   iii. The same
   iv. A little more connected
   v. Much more connected
   vi. 

f. Your community
   i. Much less connected
   ii. A little less connected
   iii. The same
iv. A little more connected
v. Much more connected

110. In the last month, how much have you missed being with people who do not live with you:

a. Close Friends
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

b. Other friends
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

c. Family
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

d. Teachers
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

e. Community
   i. Not at all
   ii. A little
   iii. Somewhat
   iv. Very

111. In the last month, how often have you felt lonely?

a. Never
b. Once
c. Several Times
d. A few times a week
e. Nearly every day

112. In the last month, what have you typically been doing for physical exercise?

a. Biking
b. Running
c. Dance
d. Organized sport
e. Swimming
f. Yoga or pilates
g. Aerobics or other cardio
h. Other: [Fill in]
  i. I have not engaged in physical exercise

113. [If selected 112a-h]: On average, how often have you exercised?
    a. Less than 1 day a week
    b. At least 1 day a week
    c. 2-3 days a week
    d. 4-5 days a week
    e. Every day or nearly every day

114. [If selected 112a-h]: On average, how long have you typically exercised for?
    a. Less than 30 minutes
    b. 30-60 minutes
    c. 60-90 minutes
    d. 90+ minutes

115. In the last month, how often have you spent time in outdoors green spaces (e.g., open spaces including parks, canals, nature areas, coastal or beach front, countryside, farmland)?
    a. Less than 1 day a week
    b. At least 1 day a week
    c. 2-3 days a week
    d. 4-5 days a week
    e. Every day or nearly every day

116. How often have you spent time outside your home for at least 30 minutes not including outdoor green spaces listed above (e.g., back yard, neighborhood street)?
    a. Less than 1 day a week
    b. At least 1 day a week
    c. 2-3 days a week
    d. 4-5 days a week
    e. Every day or nearly every day

117. In the last month, how well have you been sleeping? My sleep quality has been:
    a. Not good
    b. Somewhat good
    c. Mostly good
    d. Very good

118. On an average night, how many hours did you sleep?
    a. [fill] hours

119. If you experienced trouble sleeping, was it because of (check all that apply or leave blank if no trouble sleeping):
    a. Trouble falling asleep
b. Waking up during the night 
c. Waking up earlier than you wanted to

120. In the last month, have your days had a fairly consistent routine?
   a. Not at all, every day was different
   b. Somewhat, I did some things at the same time every day
   c. Mostly, I did most things at the same time every day
   d. Very much, I did everything at the same time every day

121. Have family members really helped and supported each other?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

122. Has there been a feeling of togetherness in your family?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

123. Have family members rarely criticized each other?
   a. Not at all
   b. Somewhat
   c. Mostly
   d. Very much

124. How have your parents been discussing the coronavirus outbreak?
   a. Not at all seriously (e.g., they say it’s not a big deal)
   b. A little seriously (e.g., they say we just have to be a little more careful)
   c. Somewhat seriously (e.g., they say we should change a lot of our behavior)
   d. Very seriously (e.g., they say that it’s very dangerous and it’s important to change our behavior)

125. Do you have a difficult relationship with someone who lives in your home? If so, who?
   Check all that apply.
   a. Yes- Parent
   b. Yes- Sibling
   c. Yes- Other [fill in]
   d. No

126. [If 125a-c]: Has being at home with this person more changed things in your relationship? [logic, appears for each relationship selected]
   a. Yes, gotten worse
   b. Yes, gotten better
   c. No, stayed about the same

127. [If 125a-c]: How upsetting is it to be at home more often with this person?
a. Not at all upsetting
b. A little upsetting
c. Somewhat upsetting
d. Very upsetting

128. Have you or anyone in your household experienced any racism, prejudice, or discrimination (i.e., being treated unfairly because of some aspect of your identity) related to the coronavirus outbreak?
   a. No
   b. Yes
      i. [if b selected] Racial slur
      ii. [if b selected] Avoided because of my/their race or ethnicity
      iii. [if b selected] Attacked because of my/their race or ethnicity
      iv. [if b selected] Explain [Fill in]

129. Do you trust the government or leaders of your community to take the appropriate steps to manage your safety?
   a. Not at all
   b. A little
   c. Somewhat
   d. Very

130. How well do you feel like you understand the current pandemic and the reasoning behind social distancing?
   a. Not at all
   b. A little
   c. Somewhat
   d. Very

131. For each item below, indicate the most worried you have felt in the last month using the sliding scale from ‘not at all worried’ to ‘extremely worried.’

|                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------------|---|---|---|---|---|---|---|---|---|----|
| You would become    |   |   |   |   |   |   |   |   |   |    |
| seriously ill or    |   |   |   |   |   |   |   |   |   |    |
| die                 |   |   |   |   |   |   |   |   |   |    |
| One or both of your |   |   |   |   |   |   |   |   |   |    |
| parents would become|   |   |   |   |   |   |   |   |   |    |
| seriously ill or    |   |   |   |   |   |   |   |   |   |    |
| die                 |   |   |   |   |   |   |   |   |   |    |
| Risk Description                                                                 | Impact                                                                 |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Someone else you care about would become seriously ill or die                   | You would be unable to access care if you were sick                    |
| Someone you care about would be unable to access care if they got sick         | Infected items would be brought into your home                         |
| Need to disinfect items brought into your home                                  | Your family wouldn’t be able to pay bills                              |
| Your family wouldn’t have enough money for basic needs like food and shelter   | Your family wouldn’t have enough money for basic needs like food and shelter |
| Your family would lose their housing                                            | Your parent(s) would lose their job(s)                                 |
| Your family wouldn’t be able to get enough food |
|-----------------------------------------------|
| Your family wouldn’t be able to get other necessities like toilet paper and cleaning supplies |
| Your family wouldn’t be able to get medicine |
| Someone else that you care about wouldn’t be able to pay bills |
| Someone else that you care about wouldn’t have enough money for basic needs like food and shelter |
| Someone else that you care about would lose their housing |
| Someone else that you care about would lose their job(s) |
| Someone else that you care about wouldn’t be able to get |
| Event                                                                 | Question                                                                 |
|----------------------------------------------------------------------|--------------------------------------------------------------------------|
| Someone else that you care about wouldn’t be able to get other necessities like toilet paper and cleaning supplies | In the last month, how have you dealt with any stress or anxiety related to the coronavirus? (Check all that apply) |
| Someone else that you care about wouldn’t be able to get medicine    | a. Watched/read news                                                     |
| Something bad would happen if you went outside                        |                                                                          |
| That you wouldn’t do well in school                                   |                                                                          |
| That you made someone else sick with the coronavirus                  |                                                                          |
| That you or someone you know would be the victim of racism or discrimination |                                                                          |

132. In the last month, how have you dealt with any stress or anxiety related to the coronavirus? (Check all that apply)
   a. Watched/read news
b. Tried to distract yourself

c. Thought about all the details of the problem

d. Talked to family or friends

e. Exercised

f. Meditated

g. Sought counseling from a therapist or religious leader

h. Self-care activities
   i. Explain [Fill in]

i. Other
   i. Explain [Fill in]

133. Have you done any of the following since the beginning of the outbreak?
   a. Volunteered time at hospitals
   b. Donated/prepared food
   c. Donated money/supplies
   d. Gave shelter to displaced people
   e. Prayed/prayer group/prayer vigil
   f. Wrote letters or contacted isolated older people
   g. Cheered on health care workers
   h. Other way of helping (specify _____________________)

134. Taking everything into consideration, what was the most stressful part of the coronavirus outbreak and subsequent social distancing/quarantine for you personally?
   a. [Fill in]

135. Is there anything we should know about the psychological effects of the outbreak that was not covered in this survey? If no, leave blank.
   a. [Fill in]