Impact of COVID-19 Pandemic on the Mental Health of Students From 2 Semi-Rural High Schools in Georgia*

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ABSTRACT

BACKGROUND: Concerns have been raised about the consequences of the COVID-19 pandemic on the mental health of adolescents during an important developmental and social period in their lives. This study examines the mental health impact of the pandemic on high school students shortly after closure of public schools in spring 2020, and whether this impact varies by sex, race/ethnicity, socioeconomic status (SES), and grade level.

METHODS: A cross-sectional, one-time online survey was completed by racial/ethnically and socioeconomically diverse students in 9th through 12th grade at 2 semi-rural Georgia public high schools (N = 761).

RESULTS: Overall, almost one-fourth of high school students were extremely or very worried about the pandemic, with higher rates of worry among students who are racial/ethnic minorities, lower SES, female and in older grades. Results indicated a concerning impact on the stress, anxiety, depression, and loneliness that students are feeling, particularly among girls and those in older grades. Students of color and low SES, who are already disproportionately impacted by COVID-19, are also more likely to experience mental health challenges.

CONCLUSIONS: Findings highlight important demographic differences of the impact of COVID-19 on the mental health of high school students and have implications for schools with addressing these needs.

Keywords: adolescents; mental health; health disparities; stress; COVID-19; coronavirus.

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Among the innumerable societal upheavals instigated by the coronavirus (COVID-19) outbreak, the pandemic has caused an unprecedented disruption in our nation’s education system and the well-being of students. The US Centers for Disease Control and Prevention (CDC) suggests that children and teenagers may respond more strongly to the stress of a crisis, such as the current COVID-19 pandemic, compared to adults.1 As the COVID-19 pandemic continues, Americans have become increasingly concerned about family members contracting the virus. In March 2020, a nationally representative survey found that 31% of adults were very or extremely worried about becoming infected with COVID-19, representing a 45% increase from polls conducted only a month earlier.2 Compared to older adults, young adults aged 18-29 years were more concerned about someone in their family contracting the coronavirus.2 However, similar assessments have not been conducted among high school-aged adolescents.
Moreover, the abrupt move to online learning in mid-March 2020 introduced mitigation strategies of social distancing and stay-at-home orders to reduce viral spread, which likely have consequences on students’ mental health, including increased loneliness, anxiety, or depression. Preliminary cross-sectional findings in a study of high school-aged adolescents in China indicated an increase in depressive and anxiety symptoms during the COVID-19 pandemic. A longitudinal study of children in China in grades 4 through 8 indicated a significant increase in depressive symptoms, suicidal ideation, plans, and attempts between pre- and during-COVID-19 time periods. Other early studies in the United Kingdom suggest that since social distancing measures began, over one-third of adolescents reported high levels of loneliness and poorer positive well-being than their parents. Almost half of young adults aged 18-24 report feeling lonely during the pandemic, compared to 1 in 6 feeling lonely before stay-at-home measures. Research is needed to improve understanding of the mental health implications of the pandemic among adolescents, particularly with many schools operating in a virtual learning environment in fall 2020.

COVID-19 disproportionately impacts vulnerable populations, including racial and ethnic minority groups and individuals of lower socioeconomic status (SES). Higher rates of COVID-19 morbidity and mortality among minority and low SES populations could magnify stress and mental health risks in these groups. Many families are facing economic insecurity as unemployment rates increase, and groups already experiencing financial stress may be further impacted by the economic downturn. These stressors could affect adolescent mental health, particularly among disadvantaged populations. The potential mental health disparities resulting from the COVID-19 pandemic should be explored to support public health efforts among those who are particularly vulnerable. Moreover, the wide range of academic- and nonacademic-related stressors arising from the pandemic, such as pronounced economic insecurity, loss of social networks, and fear of illness, may exacerbate the current gaps in educational achievement.

The goal of this analysis was to assess the impact of the COVID-19 pandemic on the stress and mental health of high school students and explore variation by student characteristics, including race and ethnicity, SES, sex, and grade level. Specifically, this study explore if students were generally concerned about the pandemic, and whether they were experiencing pandemic-related stressors, such as financial concerns or family issues, as well as if the pandemic affected students’ depression, anxiety, and other mental health outcomes. We hypothesized that high school students would report symptoms of poor mental health and stress during the pandemic. Additionally, we hypothesized that these symptoms would be more prevalent among racial and ethnic minority students and students of lower SES. These research questions were examined in the context of 2 high schools in semi-rural Georgia, a state noted for its early and aggressive reopening plans.

METHODS

Study Design
A cross-sectional online survey was conducted at 2 Georgia public high schools to assess students’ reactions to the COVID-19 pandemic following the arrival of COVID-19 in the United States and the subsequent closure of local public schools on March 16, 2020.

Study Setting and Participants
This study was conducted using a convenience sample of students in grades 9 through 12 attending high school in a semi-rural area in northcentral Georgia. All students attending the 2 racially and economically diverse public high schools (referred to as High School A and B) were eligible to participate (N = 3946). Parents were provided with the opportunity to opt their children out of participating in the study and all youth indicated assent prior to completing the survey. Among eligible students, 19.3% (N = 761) participated in the study, including 22.4% (N = 431) of students at High School A and 16.3% (N = 330) of students at High School B. All students were eligible to participate in a raffle to receive 1 of 50 Amazon gift cards worth $25 each. A subset of participants (87.5%, N = 666) assented to having their survey data linked to demographic, educational, and fitness data provided by the school district.

Instruments
We used 2 data sources for this study: (1) online high school student COVID-19 survey; and (2) school district demographic data. The survey was developed by researchers at Emory University with input from a local high school student throughout the development process and was reviewed by additional faculty not involved in study implementation. Where possible, established survey instruments were used or adapted to measure desired constructs. The survey was organized by content area, including stress and mental health, academic success and confidence, COVID-19 knowledge and pandemic behaviors, and sleep habits. Researchers pilot-tested the survey with 4 local high school students to gain input on survey measures, length, and flow. School administrators were also provided with the opportunity to review and provide feedback.
Demographic data were collected and provided for the subset of assenting participants by the school district’s Office of Student and Data Services and deidentified data were provided for the remaining eligible students. Demographic data included sex, race, ethnicity, free or reduced lunch eligibility, and grade level. Race/ethnicity was coded as white, black, Hispanic, and other (includes American Indian, Asian, and multiracial). These data were examined as potential covariates related to the impact of COVID-19 on high school students.

This analysis focused on responses to 9 stress and mental health-related questions: (1) Generally, how worried are you about the coronavirus pandemic? (5-point Likert scale from not at all worried to extremely worried); (2) How worried are you about you or someone in your family being infected with the coronavirus? (5-point Likert scale from not at all worried to extremely worried); (3) Have you, or any of your family members or close friends, been infected with the coronavirus? (yes, no, not sure); (4) If you got the coronavirus, how serious do you think it would be? (5-point Likert scale from not at all serious to extremely serious); (5) How safe do you feel from the coronavirus when you are in each of the following places—home, outdoor public spaces (eg, park/neighborhood), indoor public spaces (eg, grocery store)? (5-point Likert scale from very unsafe to very safe); (6) In the past 7 days, how often have you felt—nervous/anxious/on edge, down/depressed/hopeless, lonely/isolated, stressed? (not at all or less than 1 day, 1-2 days, 3-4 days, 5-7 days); (7) How worried are you about the financial impact of the coronavirus pandemic on you and your family? (5-point Likert scale from not at all worried to extremely worried); (8) How difficult has it been for you to adjust to the lockdown/isolation with all members of your family? (5-point Likert scale from extremely easy to extremely difficult); and (9) What strategies are you using to cope with stress, fear, or anxiety during the coronavirus pandemic? (select all that apply from a list of 12 options, as well as an “other” category, none, and not experiencing anxiety or stress). Survey data were initially examined using all Likert response options for each question. Several of the Likert response options were combined (eg, extremely serious/very serious; not too serious/not at all serious) for ease of interpretation and to address small sample sizes in some response categories.

Race/ethnicity was coded as non-Hispanic white (white), non-Hispanic black (black), Hispanic, and other. The “other” category was created due to small sample sizes for several of the race/ethnicity options and included multiracial, Asian, Native Hawaiian/Other Pacific Islander, and American Indian/Alaska Native individuals. As has been done in other studies, free and reduced-price lunch eligibility, coded as yes/no, was included as a proxy measure for SES.

**Procedure**

The survey was conducted online via Qualtrics software (version March 2020) in English, and contained 54 questions, the majority of which were multiple-choice. Participants took approximately 10 minutes to complete the survey. All survey questions were optional. The survey link was emailed to eligible students’ school email addresses by school administrators on March 30, 2020. School administrators continued to promote the survey throughout April 2020 by resharing the link with students via email and advertising the survey on the school social media pages. The survey link was active until May 8, 2020.

**Data Analysis**

Initial analysis compared demographic characteristics of survey respondents with nonrespondents to determine the representativeness of the participants included in the analysis. Overall frequencies for each stress and mental health question were then examined. Bivariate analysis by demographic characteristics was conducted to examine participant responses to each stress and mental health question. Chi-square tests were conducted to determine whether responses differed by sex, race/ethnicity, free and reduced lunch eligibility, and grade level. Exploratory analysis assessed the relationships among loneliness, depression, anxiety, and stress using Cochran Mantel Haenszel tests, controlling for increase in social media usage.

**RESULTS**

Almost 20% of the high school students completed the survey (761/3946), with more respondents from School A (57%) than School B (43%) (Table 1). Significantly more girls responded than boys (62% vs 38%, $\chi^2 = 59.14, p < .0001$) and response rates decreased with higher grade levels (32% of 9th graders, 27% of 10th graders, 24% of 11th graders, and 17% of 12th graders, $\chi^2 = 8.32, p = .0399$). Students with disabilities and English learners had significantly lower response rates ($\chi^2 = 10.72, p = .0011$ and $\chi^2 = 13.99, p = .002$, respectively). There were no statistically significant differences in those who chose to complete the survey by race/ethnicity and free and reduced-price lunch eligibility.

Overall, almost one-fourth of respondents were extremely or very worried about the pandemic (Table 2). Although 47% were worried about either themselves or someone in their family becoming infected, 16% had a family member or close friend who had been infected. Over half of students felt that if they got COVID-19 it would be extremely or
very serious. The vast majority (93%) felt very or somewhat safe from coronavirus inside their home, compared to 57% in outdoor public areas and 24% in indoor public areas. Approximately one-third of students felt either nervous/anxious or depressed, 43% felt lonely/isolated, and 50% felt stressed 3 or more days in the past week. Findings stratified by groups of social media users suggested that social media usage did not strongly modify this relationship (Appendix 1). Almost one-third were very or extremely worried about the financial impact of the pandemic on their family, and 40% expressed that it had been extremely or very difficult to adjust to being at home during lockdown. The most common strategies used to cope with stress, fear, and anxiety included listening to music (69%), watching television or movies (60%), talking to friends/families (57%), sleeping (55%), and using social media (51%).

Compared to white students, black, Hispanic and other minority students were more likely to feel extremely or very worried about the pandemic; more likely to feel extremely or very worried about themself or someone in their family becoming infected with COVID-19; and more likely to feel that if they got COVID-19 it would be extremely or very serious ($\chi^2 = 60.11, p < .0001$) (Table 3). Additionally, black, Hispanic, and other minority students were more likely to feel very or somewhat unsafe from COVID-19 outdoors ($\chi^2 = 20.85, p = .0020$) and indoors ($\chi^2 = 18.36, p = .0054$) in public areas compared to white students. Finally, 46% of the students in the “other” category (including multiracial, as well as Asian, Native Hawaiian/Other Pacific Islander, and American Indian/Alaska Native persons) indicated they felt depressed at least 3 days a week, compared to between 26% and 29% of students in other racial/ethnic groups ($\chi^2 = 15.02, p = .0201$). The only coping strategy that differed between race/ethnic groups was sleeping, with more black, multiracial, and white students indicating using sleep compared to Hispanic students ($\chi^2 = 8.14, p = .0433$). There were no other statistically significant differences by race/ethnicity for the remaining questions.

Compared to students not eligible for free and reduced-price eligibility (FRL), FRL-eligible students were significantly more likely to be extremely or very worried about the pandemic (31% vs 19%, $\chi^2 = 14.27, p = .0008$) and about either themselves or a family member becoming infected (58% vs 39%, $\chi^2 = 26.10, p < .0001$); more likely to believe that it would be extremely or very serious if they got coronavirus (61% vs 44%, $\chi^2 = 23.70, p < .0001$); and more likely to be extremely to very worried about the financial impact (36% vs 24%, $\chi^2 = 20.91, p < .0001$) (Table 4). There were no other statistically significant differences by free and reduced-price eligibility for the remaining questions.

With the exception of family/close friends being infected and feeling safe inside their home and outdoors in public spaces, almost all of the responses to
Table 2. COVID Mental Health and Stress Questions for All Responders, N = 761

| Variable                                      | N  | %     |
|-----------------------------------------------|----|-------|
| Generally, how worried are you about the coronavirus pandemic? |    |       |
| Extremely/very worried                        | 181| 24.5  |
| Somewhat worried                              | 307| 41.5  |
| Not too worried/not at all worried            | 251| 34.0  |
| How worried are you about you or someone in your family being infected with the coronavirus? |    |       |
| Extremely/very worried                        | 349| 47.3  |
| Somewhat worried                              | 232| 31.4  |
| Not too worried/not at all worried            | 157| 21.3  |
| Have you, or any of your family members or close friends, been infected with the coronavirus? |    |       |
| Yes                                           | 120| 16.3  |
| No                                            | 522| 70.8  |
| Not sure                                      | 95 | 12.9  |
| If you got the coronavirus, how serious do you think it would be? |    |       |
| Extremely/very serious                        | 381| 51.6  |
| Somewhat serious                              | 200| 27.1  |
| Not too/not at all serious                    | 157| 21.3  |
| How safe do you feel from coronavirus inside your home? |    |       |
| Very/somewhat unsafe                          | 32 | 4.4   |
| Neither safe nor unsafe                        | 17 | 2.3   |
| Very/somewhat safe                            | 686| 93.3  |
| How safe do you feel from coronavirus outdoors in public areas? |    |       |
| Very/somewhat unsafe                          | 182| 24.7  |
| Neither safe nor unsafe                        | 138| 18.7  |
| Very/somewhat safe                            | 417| 56.6  |
| How safe do you feel from coronavirus indoors in public areas? |    |       |
| Very/somewhat unsafe                          | 380| 51.9  |
| Neither safe nor unsafe                        | 175| 23.9  |
| Very/somewhat safe                            | 177| 24.2  |
| In the past 7 days, how often have you felt nervous, anxious, or on edge? |    |       |
| Not at all or less than 1 day                 | 308| 42.1  |
| 1-2 days                                      | 195| 26.7  |
| 3 or more days                                | 228| 31.2  |
| In the past 7 days, how often have you felt down, depressed, or hopeless? |    |       |
| Not at all or less than 1 day                 | 325| 44.5  |
| 1-2 days                                      | 189| 25.9  |
| 3 or more days                                | 216| 29.6  |
| In the past 7 days, how often have you felt lonely or isolated from others? |    |       |
| Not at all or less than 1 day                 | 234| 32.1  |
| 1-2 days                                      | 182| 24.9  |
| 3 or more days                                | 314| 43.0  |
| In the past 7 days, how often have you felt stressed? |    |       |
| Not at all or less than 1 day                 | 182| 24.9  |
| 1-2 days                                      | 180| 24.7  |
| 3 or more days                                | 368| 50.4  |
| How worried are you about the financial impact of the coronavirus pandemic on you and your family? |    |       |
| Extremely/very worried                        | 214| 29.1  |
| Somewhat worried                              | 236| 32.1  |
| Not too/not at all worried                    | 286| 38.9  |
| How difficult has it been for you to adjust to the lockdown/isolation with all members of your family? |    |       |
| Extremely/very easy                           | 247| 33.4  |
| Neither easy nor difficult                    | 156| 21.1  |
| Extremely/very difficult                      | 297| 40.2  |
| N/A (not in lockdown)                         | 39 | 5.3   |

| Variable                                      | N  | %     |
|-----------------------------------------------|----|-------|
| What strategies are you using to cope with stress, fear, or anxiety during the coronavirus pandemic? (select all that apply) |    |       |
| Physical activity                             | 349| 47.4  |
| Eating                                        | 315| 42.8  |
| Sleeping                                      | 401| 54.5  |
| Mindfulness, meditation, deep breathing        | 89 | 12.1  |
| Listening to music                            | 505| 68.6  |
| Reading                                       | 150| 20.4  |
| Talking to family/friends                     | 416| 56.5  |
| Watching TV or movies                         | 443| 60.2  |
| Taking medication                             | 49 | 6.7   |
| Using social media                            | 374| 50.8  |
| Learning a new hobby or skill                 | 272| 37.0  |
| Not experiencing anxiety, stress              | 83 | 11.3  |

*Column sample sizes may not reflect the full sample due to missing responses.*

This study contributes to limited research examining the mental health impact of COVID-19 on high school students, particularly an underexamined population of racially/ethnically and socioeconomically diverse adolescents in a semirural area in Georgia. Findings from our high school student COVID-19 survey, conducted during initial school closures in spring 2020, indicate that almost 25% of students were worried about the COVID-19 pandemic and the resulting financial impact. Results also indicate a concerning effect of the pandemic on the stress, anxiety, depression, and loneliness that students are experiencing, particularly among girls and those in older grades. Students of color and low SES, who are already disproportionately impacted by COVID-19 financially and health wise, are also more likely to worry about the pandemic and to feel mental health consequences, even early on in the pandemic.

**DISCUSSION**

This study contributes to limited research examining the mental health impact of COVID-19 on high school students, particularly an underexamined population of racially/ethnically and socioeconomically diverse adolescents in a semirural area in Georgia. Findings from our high school student COVID-19 survey, conducted during initial school closures in spring 2020, indicate that almost 25% of students were worried about the COVID-19 pandemic and the resulting financial impact. Results also indicate a concerning effect of the pandemic on the stress, anxiety, depression, and loneliness that students are experiencing, particularly among girls and those in older grades. Students of color and low SES, who are already disproportionately impacted by COVID-19 financially and health wise, are also more likely to worry about the pandemic and to feel mental health consequences, even early on in the pandemic.
| Variable                                                                 | White N = 425 (%) | Black N = 103 (%) | Hispanic N = 161 (%) | Other N = 71 (%) | Chi Square Statistic | p-Value | Effect Size‡ |
|-------------------------------------------------------------------------|-------------------|-------------------|----------------------|------------------|----------------------|---------|--------------|
| Generally, how worried are you about the coronavirus pandemic?          |                   |                   |                      |                  |                      |         |              |
| Extremely/very worried                                                  | 17.6              | 42.3              | 32.3                 | 24.3             | 34.26                | <.0001‡ | .1523        |
| Somewhat worried                                                        | 43.8              | 30.9              | 40.7                 | 44.3             |                      |         |              |
| Not too worried/not at all worried                                      | 38.7              | 26.8              | 27.1                 | 31.4             |                      |         |              |
| How worried are you about you or someone in your family being infected with the coronavirus? |                   |                   |                      |                  |                      |         |              |
| Extremely/very worried                                                  | 37.8              | 61.9              | 59.4                 | 55.7             | 37.82                | <.0001‡ | .1602        |
| Somewhat worried                                                        | 38.1              | 18.6              | 26.5                 | 21.4             |                      |         |              |
| Not too worried/not at all worried                                      | 24.1              | 19.6              | 14.2                 | 22.9             |                      |         |              |
| Have you, or any of your family members or close friends, been infected with the coronavirus? |                   |                   |                      |                  |                      |         |              |
| Yes                                                                     | 14.9              | 18.8              | 17.5                 | 18.6             | 3.47                 | .7476   | .0486        |
| No                                                                      | 71.9              | 66.6              | 70.8                 | 72.9             |                      |         |              |
| Not sure                                                                | 13.2              | 15.6              | 11.7                 | 8.6              |                      |         |              |
| If you got the coronavirus, how serious do you think it would be?       |                   |                   |                      |                  |                      |         |              |
| Extremely/very serious                                                  | 39.9              | 76.3              | 64.3                 | 58.6             | 60.11                | <.0001‡ | .2019        |
| Somewhat serious                                                        | 32.9              | 10.3              | 22.1                 | 27.1             |                      |         |              |
| Not too worried/not at serious                                          | 27.2              | 13.4              | 13.6                 | 14.3             |                      |         |              |
| How safe do you feel from coronavirus inside your home?                 |                   |                   |                      |                  |                      |         |              |
| Very/somewhat unsafe                                                    | 4.4               | 2.1               | 5.9                  | 4.3              | 3.84                 | .6981   | .0512        |
| Neither safe nor unsafe                                                 | 1.9               | 3.1               | 2.0                  | 4.3              |                      |         |              |
| Very/somewhat safe                                                      | 93.7              | 94.9              | 92.2                 | 91.4             |                      |         |              |
| How safe do you feel from coronavirus outdoors in public areas?        |                   |                   |                      |                  |                      |         |              |
| Very/somewhat unsafe                                                    | 19.8              | 37.1              | 27.3                 | 30.0             | 20.85                | .0020‡  | .1190        |
| Neither safe nor unsafe                                                 | 17.6              | 18.6              | 18.8                 | 25.7             |                      |         |              |
| Very/somewhat safe                                                      | 62.7              | 44.3              | 53.9                 | 44.3             |                      |         |              |
| How safe do you feel from coronavirus indoors in public areas?         |                   |                   |                      |                  |                      |         |              |
| Very/somewhat unsafe                                                    | 48.1              | 65.3              | 51.6                 | 56.5             | 18.36                | .0054‡  | .1121        |
| Neither safe nor unsafe                                                 | 22.6              | 20.0              | 29.0                 | 26.1             |                      |         |              |
| Very/somewhat safe                                                      | 29.4              | 14.7              | 19.4                 | 17.4             |                      |         |              |
| In the past 7 days, how often have you felt nervous, anxious, or on edge? |                   |                   |                      |                  |                      |         |              |
| Not at all or less than 1 day                                           | 39.6              | 50.5              | 44.7                 | 40.6             | 10.57                | .1027   | .0851        |
| 1-2 days                                                                | 28.0              | 27.4              | 26.3                 | 17.4             |                      |         |              |
| 3 or more days                                                          | 32.4              | 22.1              | 20.0                 | 42.0             |                      |         |              |
| In the past 7 days, how often have you felt down, depressed, or hopeless? |                   |                   |                      |                  |                      |         |              |
| Not at all or less than 1 day                                           | 46.6              | 47.9              | 41.5                 | 33.3             | 15.02                | .0201‡  | .1015        |
| 1-2 days                                                                | 24.2              | 26.6              | 32.9                 | 20.3             |                      |         |              |
| 3 or more days                                                          | 29.2              | 25.5              | 25.7                 | 46.4             |                      |         |              |
| In the past 7 days, how often have you felt lonely or isolated from others? |                   |                   |                      |                  |                      |         |              |
| Not at all or less than 1 day                                           | 31.4              | 39.4              | 32.2                 | 26.1             | 6.74                 | .3456   | .0680        |
| 1-2 days                                                                | 25.1              | 21.3              | 28.3                 | 20.3             |                      |         |              |
| 3 or more days                                                          | 43.5              | 39.4              | 39.5                 | 53.6             |                      |         |              |
| In the past 7 days, how often have you felt stressed?                  |                   |                   |                      |                  |                      |         |              |
| Not at all or less than 1 day                                           | 24.7              | 33.0              | 22.9                 | 20.3             | 6.01                 | .4226   | .0642        |
| 1-2 days                                                                | 24.2              | 22.3              | 28.1                 | 21.7             |                      |         |              |
| 3 or more days                                                          | 51.1              | 44.7              | 49.0                 | 58.0             |                      |         |              |
| How worried are you about the financial impact of the coronavirus pandemic on you and your family? |                   |                   |                      |                  |                      |         |              |
| Extremely/very worried                                                  | 25.6              | 32.3              | 32.3                 | 38.6             | 12.38                | .0540‡  | .0918        |
| Somewhat worried                                                        | 31.2              | 33.3              | 36.8                 | 24.3             |                      |         |              |
| Not too worried/not at all worried                                      | 43.2              | 34.4              | 31.0                 | 37.1             |                      |         |              |
| How difficult has it been for you to adjust to the lockdown/isolation with all members of your family? |                   |                   |                      |                  |                      |         |              |
| Extremely/somewhat easy                                                 | 34.4              | 42.3              | 28.4                 | 25.7             | 16.07                | .0654   | .0852        |
| Neither easy nor difficult                                              | 19.2              | 17.5              | 23.2                 | 32.9             |                      |         |              |
| Extremely/somewhat difficult                                            | 41.4              | 38.1              | 41.9                 | 32.9             |                      |         |              |
| N/A (not in lockdown)                                                   | 5.1               | 2.1               | 6.5                  | 8.6              |                      |         |              |
Table 3. Continued

| Variable                                                                 | White N = 425 (%) | Black N = 103 (%) | Hispanic N = 161 (%) | Other N = 71 (%) | Chi Square Statistic | p-Value | Effect Size‡ |
|-------------------------------------------------------------------------|-------------------|-------------------|----------------------|------------------|----------------------|---------|-------------|
| What strategies are you using to cope with stress, fear, or anxiety during the coronavirus pandemic? (select all that apply) |                   |                   |                      |                  |                      |         |             |
| Physical activity                                                       | 48.8              | 41.5              | 50.3                 | 40.0             | 3.71                 | .2944   | .0711       |
| Eating                                                                  | 40.4              | 47.9              | 45.2                 | 44.3             | 2.40                 | .4946   | .0571       |
| Sleeping                                                                | 54.8              | 60.6              | 45.8                 | 62.9             | 8.14                 | .0433   | 1.052       |
| Mindfulness, meditation, deep breathing                                  | 11.1              | 16.0              | 12.3                 | 12.9             | 1.78                 | .6193   | .0492       |
| Listening to music                                                      | 69.0              | 72.3              | 66.5                 | 67.1             | 1.04                 | .7918   | .0376       |
| Reading                                                                 | 22.1              | 19.2              | 16.1                 | 21.4             | 2.63                 | .4522   | .0598       |
| Talking to family/friends                                               | 56.5              | 52.1              | 56.8                 | 61.4             | 1.43                 | .6992   | .0441       |
| Watching TV or movies                                                   | 59.4              | 62.8              | 60.7                 | 60.0             | 0.39                 | .9425   | .0230       |
| Taking medication                                                       | 8.7               | 3.2               | 4.5                  | 4.3              | 6.25                 | .0999   | .0922       |
| Using social media                                                      | 46.9              | 54.3              | 54.8                 | 60.0             | 6.39                 | .0939   | .0933       |
| Learning a new hobby or skill                                          | 36.3              | 35.1              | 38.1                 | 41.4             | 0.90                 | .8262   | .0349       |

*Significant, p < 0.05.
‡Effect size reported using Cramer’s V or Phi coefficient.
*Race/ethnicity was missing for one respondent, who was excluded from analysis; Missing values for variables range from 3% to 4% and are excluded from percentages in this table. Percentages may not add up to 100 due to rounding.

Table 4. COVID Mental Health and Stress Questions Stratified by Free and Reduced Lunch (FRL) Eligibility, N = 747*

| Variable                                                                 | FRL, N = 322 (%) | No FRL, N = 425 (%) | Chi-Square Statistic | p-Value | Effect Size‡ |
|-------------------------------------------------------------------------|------------------|---------------------|----------------------|---------|-------------|
| Generally, how worried are you about the coronavirus pandemic?          |                   |                     |                      |         |             |
| Extremely/very worried                                                  | 31.2             | 19.1                | 14.27                | .0008*  | .1403       |
| Somewhat worried                                                        | 38.6             | 44.2                |                      | .2857   |             |
| Not too worried/not at all worried                                      | 30.2             | 36.7                |                      | .2857   |             |
| How worried are you about you or someone in your family being infected with the coronavirus? |                   |                     |                      |         |             |
| Extremely/very worried                                                  | 57.9             | 38.7                | 26.10                | <.0001* | .1899       |
| Somewhat worried                                                        | 25.4             | 36.6                |                      | .2857   |             |
| Not too worried/not at all worried                                      | 16.7             | 24.7                |                      | .2857   |             |
| Have you, or any of your family members or close friends, been infected with the coronavirus? |                   |                     |                      |         |             |
| Yes                                                                     | 14.9             | 17.4                | 2.70                 | .2589   | .0611       |
| No                                                                      | 70.2             | 71.5                |                      | .2857   |             |
| Not sure                                                                | 14.9             | 11.1                |                      | .2857   |             |
| If you got the coronavirus, how serious do you think it would be?       |                   |                     |                      |         |             |
| Extremely/very serious                                                  | 61.4             | 44.3                | 23.70                | <.0001* | .1809       |
| Somewhat serious                                                        | 19.0             | 32.9                |                      | .2857   |             |
| Not too worried/not at all serious                                      | 19.6             | 22.8                |                      | .2857   |             |
| How safe do you feel from coronavirus inside your home?                 |                   |                     |                      |         |             |
| Very/somewhat unsafe                                                   | 5.8              | 3.2                 | 5.82                 | .0544*  | .0899       |
| Neither safe nor unsafe                                                 | 3.2              | 1.5                 |                      | .2857   |             |
| Very/somewhat safe                                                      | 90.9             | 95.4                |                      | .2857   |             |
| How safe do you feel from coronavirus outdoors in public areas?        |                   |                     |                      |         |             |
| Very/somewhat unsafe                                                   | 27.7             | 21.8                | 5.14                 | .0767   | .0843       |
| Neither safe nor unsafe                                                 | 19.7             | 17.4                |                      | .2857   |             |
| Very/somewhat safe                                                      | 52.6             | 60.8                |                      | .2857   |             |
| How safe do you feel from coronavirus indoors in public areas?         |                   |                     |                      |         |             |
| Very/somewhat unsafe                                                   | 53.7             | 50.4                | 1.68                 | .4325   | .0483       |
| Neither safe nor unsafe                                                 | 24.3             | 23.5                |                      | .2857   |             |
| Very/somewhat safe                                                      | 22.0             | 26.2                |                      | .2857   |             |
| In the past 7 days, how often have you felt nervous, anxious, or on edge? |                   |                     |                      |         |             |
| Not at all or less than 1 day                                          | 46.4             | 39.4                | 5.72                 | .0573   | .0893       |
| 1-2 days                                                               | 22.2             | 29.7                |                      | .2857   |             |
| 3 or more days                                                         | 31.4             | 30.9                |                      | .2857   |             |
However, 1 study conducted with high school students from China indicating that approximately 20–25% of adolescents were experiencing general mental strife, depression, and anxiety related to the COVID-19 pandemic. Moreover, consistent with our results, girls and students in older grades were at higher risk for depressive and anxiety symptoms. These findings indicate a need for further research, resource allocation, and interventions for vulnerable adolescent groups.

This study has at least 4 notable strengths. First, it was conducted in an underexamined population of racially/ethnically and socioeconomically diverse adolescents in a semirural area. Second, this study fills an understudied gap in the literature examining the impact of COVID-19 with most existing research targeting adult populations. Third, the survey was conducted shortly after school closures to obtain timely information to share with the schools and to assist them with preparation for upcoming semesters. Finally, the survey utilized several existing survey items to examine the impact of COVID-19 with most existing research targeting adult populations.

Despite these strengths, there are several limitations. First, the response rate was lower than anticipated; however, it was similar to other online surveys conducted shortly after school closures to obtain timely information to share with the schools and to assist them with preparation for upcoming semesters. Finally, the survey utilized several existing survey items to examine the impact of COVID-19 with most existing research targeting adult populations.

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| Variable                                                                 | Girls, N = 470 (%) | Boys, N = 288 (%) | Chi-Square Statistic | p-Value | Effect Size‡ |
|--------------------------------------------------------------------------|--------------------|-------------------|----------------------|---------|-------------|
| Generally, how worried are you about the coronavirus pandemic?           |                    |                   |                      |         |             |
| Extremely/very worried                                                   | 29.0 (16.8)        | 16.8              | 27.51                | <.0001* | .1933       |
| Somewhat worried                                                        | 43.6 (38.2)        |                   |                      |         |             |
| Not too worried/not at all worried                                       | 27.4 (45.0)        |                   |                      |         |             |
| How worried are you about you or someone in your family being infected with the coronavirus? |                    |                   |                      |         |             |
| Extremely/very worried                                                   | 51.7 (39.6)        |                   | 13.53                | .0012*  | 1.1357      |
| Somewhat worried                                                        | 30.8 (32.9)        |                   |                      |         |             |
| Not too worried/not at all worried                                       | 17.6 (27.5)        |                   |                      |         |             |
| Have you, or any of your family members or close friends, been infected with the coronavirus? |                    |                   |                      |         |             |
| Yes                                                                     | 17.8 (13.6)        |                   | 3.99                 | .1362   | .0737       |
| No                                                                      | 70.8 (71.0)        |                   |                      |         |             |
| Not sure                                                                | 11.4 (15.4)        |                   |                      |         |             |
| If you got the coronavirus, how serious do you think it would be?        |                    |                   |                      |         |             |
| Extremely/very serious                                                   | 55.4 (45.4)        |                   | 10.49                | .0053*  | .1195       |
| Somewhat serious                                                        | 26.8 (27.5)        |                   |                      |         |             |
| Not too/not at all serious                                               | 17.8 (27.1)        |                   |                      |         |             |
| How safe do you feel from coronavirus inside your home?                  |                    |                   |                      |         |             |
| Very/somewhat unsafe                                                    | 4.6 (3.6)          |                   | 1.03                 | .5981   | .0375       |
| Neither safe nor unsafe                                                  | 2.0 (2.9)          |                   |                      |         |             |
| Very/somewhat safe                                                      | 93.4 (93.6)        |                   |                      |         |             |
| How safe do you feel from coronavirus outdoors in public areas?         |                    |                   |                      |         |             |
| Very/somewhat unsafe                                                    | 24.0 (25.1)        |                   | 0.29                 | .8652   | .0199       |
| Neither safe nor unsafe                                                  | 18.5 (19.4)        |                   |                      |         |             |
| Very/somewhat safe                                                      | 57.6 (55.6)        |                   |                      |         |             |
| How safe do you feel from coronavirus indoors in public areas?          |                    |                   |                      |         |             |
| Very/somewhat unsafe                                                    | 56.4 (44.0)        |                   | 12.93                | .0016*  | .1332       |
| Neither safe nor unsafe                                                  | 23.2 (25.3)        |                   |                      |         |             |
| Very/somewhat safe                                                      | 20.4 (30.7)        |                   |                      |         |             |
| In the past 7 days, how often have you felt nervous, anxious, or on edge?|                    |                   |                      |         |             |
| Not at all or less than 1 day                                            | 33.6 (56.7)        |                   | 38.68                | <.0001* | .2305       |
| 1-2 days                                                                | 29.6 (21.8)        |                   |                      |         |             |
| 3 or more days                                                          | 36.9 (21.5)        |                   |                      |         |             |
| In the past 7 days, how often have you felt down, depressed, or hopeless?|                    |                   |                      |         |             |
| Not at all or less than 1 day                                            | 35.6 (59.6)        |                   | 41.33                | <.0001* | .2384       |
| 1-2 days                                                                | 29.0 (21.1)        |                   |                      |         |             |
| 3 or more days                                                          | 35.4 (19.3)        |                   |                      |         |             |
| In the past 7 days, how often have you felt lonely or isolated from others?|                    |                   |                      |         |             |
| Not at all or less than 1 day                                            | 25.2 (43.3)        |                   | 26.34                | <.0001* | .1903       |
| 1-2 days                                                                | 26.6 (22.6)        |                   |                      |         |             |
| 3 or more days                                                          | 48.2 (34.2)        |                   |                      |         |             |
| In the past 7 days, how often have you felt stressed?                   |                    |                   |                      |         |             |
| Not at all or less than 1 day                                            | 16.0 (39.9)        |                   | 63.71                | <.0001* | .2960       |
| 1-2 days                                                                | 23.7 (26.5)        |                   |                      |         |             |
| 3 or more days                                                          | 60.3 (33.7)        |                   |                      |         |             |
| How worried are you about the financial impact of the coronavirus pandemic on you and your family? |                    |                   |                      |         |             |
| Extremely/very worried                                                  | 32.8 (22.3)        |                   | 9.89                 | .0071*  | .1162       |
| Somewhat worried                                                        | 31.4 (33.5)        |                   |                      |         |             |
| Not too worried/not at all worried                                       | 35.8 (44.2)        |                   |                      |         |             |
| How difficult has it been for you to adjust to the lockdown/isolation with all members of your family? |                    |                   |                      |         |             |
| Extremely/somewhat easy                                                 | 26.5 (44.3)        |                   | 29.22                | <.0001* | .1993       |
| Neither easy nor difficult                                               | 24.8 (15.4)        |                   |                      |         |             |
| Extremely/somewhat difficult                                            | 44.1 (33.9)        |                   |                      |         |             |
| N/A (not in lockdown)                                                    | 4.6 (6.4)          |                   |                      |         |             |
in terms of race and free and reduced lunch eligibility status, but there was a lower response rate among boys, students in higher grades (older students), and students with disabilities and English language learners. Second, there may be some measurement error introduced by using free and reduced lunch eligibility as a proxy measure for SES. There are limitations to using this measure; in particular, free and reduced lunch eligibility may not fully capture poverty.16,17 Third, due to small counts, several racial/ethnic groups were combined into the “other races” category. Thus, the heterogeneity of this category makes it difficult to draw conclusions about this population. Additionally, this study was conducted among a convenience sample of students from 2 high schools in the same geographic area, limiting the ability to generalize findings outside of this population. Finally, our data were collected cross-sectionally, and do not account for mental health and stress symptoms prior to the pandemic. The temporality of the COVID-19 situation with constantly changing mitigation recommendations and emerging new evidence could show a longitudinal effect on stress and mental health over time, and future multivariate analyses could explain some of the observed discrepancies in mental health outcomes across groups.

The conclusions from this study can help us understand the effects of pandemics on teenagers and can provide the groundwork for developing future intervention programs, particularly with addressing the mental health consequences for vulnerable populations.22 Interventions addressing both the quantity and quality of social interactions may be useful to address the high rates of loneliness that many have been experiencing, such as providing opportunities for socializing virtually with other students, providing more classroom group activities, and offering high school club activities remotely. Moreover, future work is needed to reach students who may need additional types of support, including students with disabilities, English learners, students with existing mental health challenges or a history of substance abuse, students exposed to domestic abuse during quarantine, and students whose families were directly impacted by COVID-19. Despite the assumption that virtual learning may have negative consequences on student’s achievement, there is some suggestion that some adolescents are actually doing better with remote learning. With the potential exposure to adverse peer interactions, teacher’s supervision and time limits, some students may be able to better focus on their academics and flourish.23-25 More research is clearly needed to improve understanding of the prevalence of positive outcomes from remote learning. Furthermore, additional research on a larger, ethno-racially, socioeconomically, and geographically diverse population is needed. Careful monitoring of adolescent mental health will be needed for years to come to deal with the pandemic’s aftermath, particularly among underserved populations that may feel the ongoing impact of the economic recession on their family.26

**IMPLICATIONS FOR SCHOOL HEALTH**

Findings from this study have important implications for schools about opportunities to address stress related to the pandemic and provide the groundwork for developing targeted intervention programs for students at higher risk. Regardless of the ongoing debate about whether schools should be open or not during the pandemic, schools provide a critical resource for their students to be connected to their peers and academic mentors. In particular, opportunities for social engagement for virtual learners should be implemented and identifying virtual learners who
| Variable                                                                 | 9th grade, N = 244 (%) | 10th grade, N = 203 (%) | 11th grade, N = 182 (%) | 12th grade, N = 132 (%) | Chi-Square | p-Value | Effect Size† |
|--------------------------------------------------------------------------|------------------------|--------------------------|--------------------------|--------------------------|------------|---------|--------------|
| Generally, how worried are you about the coronavirus pandemic?           |                        |                          |                          |                          |            |         |              |
| Extremely/very worried                                                   | 21.3                   | 20.4                     | 25.7                     | 34.9                     | 22.93      | .0008* | .0124        |
| Somewhat worried                                                        | 36.6                   | 48.0                     | 46.3                     | 36.4                     |            |         |              |
| Not too worried/not at all worried                                      | 43.1                   | 31.6                     | 28.0                     | 28.7                     |            |         |              |
| How worried are you about you or someone in your family being infected  |                        |                          |                          |                          |            |         |              |
| with the coronavirus?                                                    |                        |                          |                          |                          |            |         |              |
| Extremely/very worried                                                   | 42.4                   | 47.5                     | 47.4                     | 55.8                     | 11.57      | .0723   | .0885        |
| Somewhat worried                                                        | 30.7                   | 33.2                     | 35.4                     | 24.8                     |            |         |              |
| Not too worried/not at all worried                                      | 26.9                   | 19.4                     | 17.1                     | 19.4                     |            |         |              |
| Have you, or any of your family members or close friends, been infected  |                        |                          |                          |                          |            |         |              |
| with the coronavirus?                                                    |                        |                          |                          |                          |            |         |              |
| Yes                                                                      | 14.7                   | 14.8                     | 14.9                     | 23.3                     | 7.24       | .2991   | .0701        |
| No                                                                       | 71.4                   | 71.9                     | 70.7                     | 68.2                     |            |         |              |
| Not sure                                                                | 13.9                   | 13.3                     | 14.4                     | 8.5                      |            |         |              |
| If you got the coronavirus, how serious do you think it would be?        |                        |                          |                          |                          |            |         |              |
| Extremely/very serious                                                   | 51.3                   | 54.9                     | 46.9                     | 54.3                     | 6.74       | .3454   | .0676        |
| Somewhat serious                                                        | 23.9                   | 27.7                     | 30.9                     | 27.1                     |            |         |              |
| Not too worried/not at all serious                                      | 25.1                   | 17.4                     | 22.3                     | 18.6                     |            |         |              |
| How safe do you feel from coronavirus inside your home?                  |                        |                          |                          |                          |            |         |              |
| Very/somewhat unsafe                                                    | 2.5                    | 3.1                      | 6.3                      | 7.0                      | 8.31       | .2251   | .0752        |
| Neither safe nor unsafe                                                 | 3.4                    | 1.6                      | 2.3                      | 1.6                      |            |         |              |
| Very/somewhat safe                                                      | 94.1                   | 95.4                     | 91.4                     | 91.4                     |            |         |              |
| How safe do you feel from coronavirus outdoors in public areas?         |                        |                          |                          |                          |            |         |              |
| Very/somewhat unsafe                                                    | 23.0                   | 24.2                     | 23.4                     | 30.2                     | 4.68       | .5849   | .0564        |
| Neither safe nor unsafe                                                 | 21.8                   | 18.6                     | 17.7                     | 14.7                     |            |         |              |
| Very/somewhat safe                                                      | 55.2                   | 57.2                     | 58.9                     | 55.0                     |            |         |              |
| How safe do you feel from coronavirus indoors in public areas?          |                        |                          |                          |                          |            |         |              |
| Very/somewhat unsafe                                                    | 47.5                   | 46.4                     | 58.3                     | 60.0                     | 12.91      | .0445*  | .0939        |
| Neither safe nor unsafe                                                 | 25.6                   | 24.2                     | 24.0                     | 20.0                     |            |         |              |
| Very/somewhat safe                                                      | 26.9                   | 29.4                     | 17.7                     | 20.0                     |            |         |              |
| In the past 7 days, how often have you felt nervous, anxious, or on edge?|                        |                          |                          |                          |            |         |              |
| Not at all or less than 1 day                                           | 45.1                   | 48.2                     | 39.7                     | 31.0                     | 13.60      | .0375*  | .0956        |
| 1-2 days                                                                | 28.1                   | 24.4                     | 25.9                     | 28.7                     |            |         |              |
| 3 or more days                                                          | 26.8                   | 27.5                     | 34.5                     | 40.3                     |            |         |              |
| In the past 7 days, how often have you felt down, depressed, or hopeless?|                        |                          |                          |                          |            |         |              |
| Not at all or less than 1 day                                           | 51.7                   | 49.2                     | 32.8                     | 40.3                     | 23.79      | .0059*  | .1114        |
| 1-2 days                                                                | 23.9                   | 23.8                     | 31.0                     | 25.6                     |            |         |              |
| 3 or more days                                                          | 24.4                   | 26.9                     | 36.2                     | 34.1                     |            |         |              |
| In the past 7 days, how often have you felt lonely or isolated from others? |                        |                          |                          |                          |            |         |              |
| Not at all or less than 1 day                                           | 34.9                   | 34.2                     | 25.3                     | 32.8                     | 12.47      | .3378   | .0683        |
| 1-2 days                                                                | 21.7                   | 26.9                     | 28.2                     | 23.4                     |            |         |              |
| 3 or more days                                                          | 43.4                   | 38.9                     | 46.6                     | 43.8                     |            |         |              |
| In the past 7 days, how often have you felt stressed?                   |                        |                          |                          |                          |            |         |              |
| Not at all or less than 1 day                                           | 28.6                   | 28.5                     | 19.4                     | 20.3                     | 14.62      | .0284*  | .0983        |
| 1-2 days                                                                | 29.1                   | 20.2                     | 23.4                     | 25.0                     |            |         |              |
| 3 or more days                                                          | 42.3                   | 51.3                     | 57.1                     | 54.7                     |            |         |              |
| How worried are you about the financial impact of the coronavirus pandemic on you and your family? |                        |                          |                          |                          |            |         |              |
| Extremely/very worried                                                   | 23.6                   | 28.1                     | 26.3                     | 44.5                     | 22.80      | .0009*  | .1244        |
| Somewhat worried                                                        | 32.9                   | 29.1                     | 37.1                     | 28.1                     |            |         |              |
| Not too worried/not at all worried                                      | 43.5                   | 42.9                     | 36.6                     | 27.3                     |            |         |              |
| How difficult has it been for you to adjust to the lockdown/isolation with all members of your family? |                        |                          |                          |                          |            |         |              |
| Extremely/somewhat easy                                                 | 34.7                   | 39.8                     | 32.6                     | 22.5                     | 15.59      | .0760   | .0838        |
| Neither easy nor difficult                                              | 20.9                   | 21.4                     | 20.6                     | 21.7                     |            |         |              |
| Extremely/somewhat difficult                                            | 39.8                   | 35.7                     | 41.1                     | 46.5                     |            |         |              |
| N/A (not in lockdown)                                                   | 4.6                    | 3.1                      | 5.7                      | 9.3                      |            |         |              |

Table 6. COVID Mental Health and Stress Questions Stratified by Grade Level, N = 761

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are thriving with this modality can assist with providing guidance to those who may be struggling with this modality. Following a summer of social isolation, limited academic engagement/stimulation, and the generally worsening pandemic, significant attention should be paid to addressing mental health symptoms, which also impact educational achievement and could worsen the achievement gap. Interventions are needed to mitigate the effect of the pandemic on adolescent mental health. Strategies may include improving resilience of teenagers, developing peer support networks, leveraging digital technology for mental health support, facilitating partnerships between families and mental health providers, and ongoing government support. Lessons from existing strategies in the context of involuntary social isolation for adolescents can also be applied. These strategies include maintaining the structure, quality, and quantity of social networks, promoting activities to feel part of a group, and sharing resources to support.

Schools are a critical partner in providing mental health services and resources to youth because of their proximity to students. Although school counselors, school social workers, and school psychologists are trained mental health providers in schools, teachers will likely be tasked with providing this support to students during the pandemic and will need appropriate training and resources. Grade-specific support needs also should be identified with different types of stress experienced between younger and older grades. For example, students in older grades are likely to need additional support as they begin to explore college and career plans, while younger students may need more assistance integrating with their peers and adjusting to the high school environment. There are also developmental, racial, and socioeconomic considerations that should be explored to provide appropriate mental health support to these students.

As the pandemic continues, there is an urgent need to monitor students’ mental health and to examine how school teaching modalities and infection mitigation strategies influence the mental health of adolescents. From a broader social perspective, the findings from the study may underscore the importance of involving researchers, policymakers, educators, community groups, and parents to address stress related to the coronavirus pandemic.

Human Subjects Approval Statement

The Emory University Institutional Review Board reviewed and provided expedited approval for this study (STUDY00000408).

Conflict of Interest

The authors declare no conflict of interest.

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Appendix 1. Bivariate Analysis Examining the Relationship Between Loneliness and Anxiety, Depression, and Stress, Stratified by Increased Social Media Use

|                          | Increased Social Media Use | No Increase in Social Media Use |
|--------------------------|----------------------------|--------------------------------|
|                          | Not At All or Less Than 1 day | 1-2 Days | 3 or More Days | Chi-Square | p-Value | Not At All or Less Than 1 day | 1-2 Days | 3 or More Days | Chi-Square | p-Value |
| In the past 7 days, how often have you felt lonely or isolated from others? (Loneliness) |                          |          |                |            |        |                          |          |                |            |        |
| In the past 7 days, how often have you felt nervous, anxious, or on edge? (Anxiety) | Not at all or less than 1 day | 60 (44.4%) | 38 (28.2%) | 37 (27.4%) | 70.71 | <.0001 | 106 (62.3%) | 36 (21.2%) | 28 (16.5%) | 86.55 | <.0001 |
| 1-2 days                     | 66 (47.5%) | 44 (31.7%) | 29 (20.9%) | 125.27 | <.0001 | 120 (65.9%) | 33 (18.1%) | 29 (15.9%) | 146.84 | <.0001 |
| 3 or more days              | 17 (15.2%) | 45 (40.2%) | 50 (44.6%) | 17 (22.1%) | 40 (40.3%) | 29 (37.7%) | 6 (6.9%) | 13 (13.7%) | 76 (80.0%) |          |          |
| In the past 7 days, how often have you felt down, depressed, or hopeless? (Depressed) | Not at all or less than 1 day | 38 (61.3%) | 12 (21.0%) | 11 (17.7%) | 86.10 | <.0001 | 86 (72.3%) | 23 (19.3%) | 10 (8.4%) | 109.81 | <.0001 |
| 1-2 days                     | 28 (31.8%) | 32 (36.4%) | 28 (31.8%) | 34 (37.4%) | 27 (29.7%) | 30 (33.0%) | 24 (16.6%) | 27 (18.6%) | 94 (64.8%) |          |          |
| 3 or more days              | 23 (10.4%) | 58 (26.2%) | 140 (63.4%) | 10 (8.4%) | 30 (33.0%) | 94 (64.8%) |          |          |            |          |          |