# The Association Between Coping Strategies, Resilience, and Flourishing Among Students at Large U.S. University During the COVID-19 Pandemic: A Mixed Methods Research Study

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## ABSTRACT

**Background:** Mental illness indicators increased among U.S. university students in recent years; COVID-19 associated disruptions presented additional mental health challenges for students.
**Aim**: This research aimed to assess the relationship between coping strategies identified by university students and scores on resilience and flourishing scales and to identify additional themes that described student experiences during the COVID-19 pandemic.
**Methods:** An online survey was administered to students at a large public Midwestern University. Quantitative data were assessed using nonparametric tests for association and qualitative data were analyzed using cycles of open coding.
**Results:** Most of the 3,473 respondents were female (76.5%) and white (83.6%), with a mean age of 24.67 years ($SD$ = 8.08). The most frequent coping strategy was physical activity participation ($n$ = 712), followed by socializing ($n$ = 507). The highest resilience and flourishing scores were associated with compliance to COVID-19 associated recommendations or spiritual activities. Qualitative themes included the value of focusing on controllable aspects, the need to be strong for others, and the experience of academic overload during transition to online learning.
**Conclusions:** Universities should endeavor to provide ongoing availability of counseling during university disruptions. Universities might also consider proactive efforts to guide students toward proficiency in strategies that improve coping skills, including some that do not center around technology.

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## BACKGROUND

In March of 2020, American institutions of higher education suspended or transitioned multiple activities to virtual delivery including campus housing, health services, student engagement, and academic courses to limit spread of the novel coronavirus. The COVID-19 pandemic occurred during a period of renewed focus on university student mental health outcomes precipitated by increases in rates of mental illness indicators; mental health treatment seeking by college and university students in the United States (U.S.) increased from 19% to 34% between 2007 and 2017 (Lipson et al., 2019). The prevalence of reported psychological distress among university students during typical circumstances suggests a need for concern about the mental health impact of sudden and drastic adjustments to everyday life, such as those associated with COVID-19. Results of the Spring 2019 American College Health Association-National College Health Assessment II (ACHA-NCHA) indicated that 45.1% of college and university students experienced depression that interfered with their ability to function, 65.6% felt lonely, and 65.7% felt overwhelming anxiety at some point during the prior 12 months. Additionally, 58.7% of the students surveyed rated their stress during the prior 12 months as "more than average" or "tremendous" (ACHA, 2019).

Results from research about university students conducted in China following the emergence of COVID-19 indicated that worry about economic impacts, academic delays, and the influence of the virus on daily life were associated with students' anxiety (Cao et al., 2020) and depressive symptoms (Chen et al., 2020). When containment measures were implemented in the U.S., researchers described comparable findings. New Hampshire University students reported a dramatic increase in symptoms of anxiety and depression during the week in which they were asked to leave campus (Huckins et al., 2020). Results from the Fall 2020 ACHA-NCHA survey indicated that 80.9% of college and university students rated their overall stress as "moderate" or "high" (ACHA, 2020), illustrating a noticeable decline in mental health indicators when compared to 2019.

Previous research efforts to better understand college student mental health have included exploration of general student coping strategies like problem-focused active strategies and avoidant emotion-based strategies. Examples of the former include self-regulation and cognitive reframing while the latter includes emotional responses and associated behaviors (Jensen et al., 2016; Vasileiou et al., 2019). Previously identified emotion-based coping responses used by university students to manage general stress include increased substance use (Chen et al. 2015; Jensen et al., 2016) and unhealthy eating (Choi, 2020). Emotion-based coping strategies specifically identified after the onset of the COVID-19 pandemic similarly emphasized increased alcohol consumption (Lechner et al., 2020; 2021) and overeating (Son, 2020). Conversely, post pandemic active coping strategies identified in research included use of mobile apps for health promotion and stress management (Wang, 2020).

Predictors of mental health among university students include measures of resilience, an individual's resistance to stress and adverse circumstances (American Psychological Association, 2022), and flourishing, a holistic assessment of self-perceived wellness (Diener et al., 2010). Prior researchers exploring the role of resilience among university students include Smith et al. (2016). These researchers concluded that higher resilience among Canadian university students was associated with lower levels of depression and anxiety and with higher life satisfaction, along with a greater likelihood to engage in task-oriented active coping versus avoidant emotional coping strategies. Li and Yang (2016) additionally concluded that resilience predicted the use of active coping strategies. Ye et al. (2020) conducted a post-COVID assessment of resilience among university students in China and determined that resilience and

engaging in active coping reduced acute stress disorder (ASD) symptoms, while reliance on maladaptive strategies, including emotional eating and substance use, were ineffective for managing ASD.

Doré et al. (2020) explored the association between flourishing and mental illness in longitudinal research with post-secondary students in Canada, finding that students who were not flourishing at baseline were more likely to exhibit signs of an anxiety disorder and depression at follow-up. Conversely, those who were flourishing at baseline and at follow-up, along with those who improved to flourishing from baseline to follow-up, demonstrated no increased risk for anxiety or depression. Denovan and Macaskill (2017) assessed resilience, flourishing, and coping strategies among university students in the United Kingdom and identified direct and indirect relationships between resilience and flourishing, with the indirect path mediated by leisure-focused active coping strategies.

The relatively rapid cessation of typical practices within American universities in response to the COVID-19 pandemic impacted not only students' courses, residences, and social and leisure opportunities but also presented challenges associated with employment and family circumstances. It seems clear the immediate and long-term adjustments necessitated by the COVID-19 pandemic have had negatively impacted what was already a downward trend in college student mental health. Therefore, additional insight regarding active and emotion-based coping strategies that emerged following COVID-19-associated disruptions and the associations among coping strategies and the mental health indicators of resilience and flourishing may be useful for guiding both short-term and ongoing efforts to improve mental health services and outcomes with respect to university students. Improved understanding of the associations among coping strategies, resilience, and flourishing have potential to be useful both during times of disruption and routine. The purpose of this mixed methods research study was to explore relationships among specific coping strategies associated with the onset of COVID-19, with scores on resilience and flourishing, as reported by students at a large public university in the U.S. The authors additionally sought to identify other trends from student responses that provided insight into university student mental health associated during this time of disruption. Specifically, this study addressed three questions: (1) What activities or processes described as coping strategies were associated with higher scores on student resilience? (2) What activities or processes described as coping strategies were associated with higher scores on student flourishing? And (3) what overarching themes provide an additional framework for understanding students' experiences during the pandemic?

## METHODS

### Participants and Procedure

This research was conducted as a concurrent mixed methods study implemented via an online survey for safe and large-scale access. Research participants were recruited among students enrolled during the 2020 spring semester at a large public Midwestern university who responded to an online survey soon after campus closure and the transition to remote learning in March 2020. Survey items included demographic variables and self-reported measures of mental health and wellness, substance use, social support, and coping strategies. The focus of this research report is on coping strategies and their association with the mental health indicators resilience and flourishing. Detailed reports about university student substance use are provided in Lechner et al. (2020) and Lechner et al. (2021). The email invitation informed potential respondents that participation was voluntary, responses to survey questions would be kept confidential, and that the purpose of the survey was to assess student wellness. Quantitative variables were measured

via instruments with established psychometric properties, mostly using Likert-type scales, while qualitative data were gathered via open-ended questions created by the authors. Four days after the initial email invitation, a reminder email was sent. Access to the survey closed after eleven days. To improve the response rate, six $20 Amazon.com gift cards were made available in a raffle to students who completed the survey. This survey research study was approved by the university Institutional Review Board.

A total of 4,753 students responded to the survey. The results presented in this study reflect a subsample of 3,473 students who provided answers to the open response item about coping strategies. Based on a total Spring Semester 2020 enrollment of 34,545, the overall response rate was 13.75%, and the subsample reflected a 10.1% response rate.

### Demographic and Construct Measures

Participants were asked to self-report their program type as traditional or online, indicate whether they were a domestic or international student, and provide gender identity. Other demographic variables (college/school, class rank, race, grade point average, and at which of eight campuses they were enrolled) were linked to the participant's contact email provided by the university registrar. Resilience was assessed using the Brief Resilience Scale (BRS; Smith et al., 2008), a 6-item measure where responses use Likert-scale items ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Higher overall mean BRS scores indicate higher resilience. The BRS has been shown to be a reliable and valid measure of resilience (Smith et al., 2008). The Flourishing Scale (FS) is an 8-item measure of self-perceived success that yields a single score for social-psychological prosperity (Diener et al., 2010, p. 144). Respondents are asked to self-report their level of agreement to eight statements from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). FS scores can range from 8 – 56, with higher total scores indicating higher levels of psychological well-being. The FS has been found to be reliable and to have high convergence with comparable measures (Diener et al., 2010).

### Mental Wellness Coping Strategy

Participants were asked to describe the primary strategy they were using to maintain their mental wellness during the pandemic, prompted by, "What is the number one main thing you are doing right now to maintain your mental wellness during these unusual times?" Respondents were provided an essay text box with no word limit to type their responses. No further guidance or criteria were provided.

### Data Processing

Data were first sorted to identify respondent answers to the qualitative question as cases with these responses comprised the sample of interest. Response to the BRS and FS items were checked for completeness. Two respondents did not answer one item in the BRS; the overall item mean was substituted for these responses. For each respondent, the mean score of the six items comprising the BRS and the sum of item scores for the FS were calculated.

### *Qualitative Data Analysis*

All qualitative, open-ended responses were examined by the authors to identify initial patterns. Results of this screening suggested most responses ranged in length from a single word to a short phrase and described a relatively limited range of coping strategies. A smaller number of respondents provided lengthy answers that included more detailed information about COVID-19 related perceptions and experiences. A random sample of 50 brief responses was reviewed by two authors using data-driven open coding (Gibbs, 2007) to develop an initial codebook of coping strategies. The initial codebook consisted of labels and inclusion and exclusion criteria for 14 categories. Three authors and one additional analyst applied categories to 3,473 brief open responses. Through this process, analysts developed three additional codes to address emergent trends. The category OTHER was used to encompass responses that neither aligned with any of the other 16 categories nor occurred with ample frequency to indicate a trend. More than 50% of code applications were rechecked by one of the authors and disagreements were resolved through discussion to arrive at consensus. A summary version of the codebook, with abbreviations and definitions for the 17 final codes, is shown in Table 1.

**Table 1**

*Codebook Used for Categorical Analysis*

| CODE | Definition |
|---|---|
| AVOID | Actively avoiding information about COVID-19 or other news/news sources. |
| CE | Engaging in creative endeavors such as visual arts, writing, sewing, playing musical instruments, singing, other arts or crafts. |
| COMPLY | Adhering to COVID-19-associated restrictions or recommendations |
| EX | Intentionally engaging in physically active recreation or exercise |
| IP | Intentional positivity illustrated by described examples of maintaining an intentionally positive attitude, e.g., "staying positive." |
| MEDIA | Engaging in/with video games, books, music, and streaming or viewing programming. |
| MH | Mental health support such as therapy, counseling, use of prescription medications or homeopathic remedies for stress, depression, anxiety, or other mental illness; self-care practices such as meditation and application of coping strategies |
| MULTI | Applied when individuals listed more than two strategies |
| NONE | Explicit description of no coping strategy (e.g., "not doing anything different," "nothing has changed," etc.) |
| PETS | Activities which center around pets including spending time with, caring for, or acquiring pets. |
| PHYS | Focus on physical health and wellness including nutrition, hygiene, and other intentional efforts. Code physical activity/exercise as EX. |
| OTHER | Use of a strategy not related to any of the other codes |
| RELAX | Rest or relaxation such as sleeping, relaxing, regulation of sleep patterns. |
| RESP | Focus on responsibilities and obligations associated with employment, academics and household or similar tasks. |
| SC | Socializing, maintaining remote/virtual contact via phone, text, social media, video conferencing, etc. |
| SPIR | Spiritual or religious activities. |
| SU | Use of illicit and legal substances, e.g., tobacco, alcohol, marijuana. Code use of prescription medications for anxiety, depression, and other mental health concerns as MH. |

Lengthy responses were identified during the initial screening and application of codebook categories. These were combined and analyzed as a single text using first cycle qualitative open coding methods, including in vivo and process coding, followed by a second cycle pattern matching process (Saldaña, 2016). In vivo and process codes were applied to 268 meaning units (Chenail, 2012), reflecting responses from 71 individuals. Similar codes were clustered to form

10 themes, which were further collapsed based on conceptual similarity into six broader themes. The three themes that did not duplicate any of the coping strategies included in the codebook were further developed and are presented in the results.

### *Statistical Analysis*

All statistical analyses were conducted using SAS version 9.4. The NPAR1WAY procedure was used to test the null hypothesis that there was no difference in the underlying distributions of the BRS and FS scores for any coping strategy versus the alternative that at least one of the distributions differed. The non-parametric Kruskal Wallis test was used to examine associations between each identified primary coping strategy and respondent scores on the BRS and Flourishing measures. Use of the NPAR1WAY procedure with the WILCOXON option provided the Kruskal-Wallis test statistic with an approximate $X^2$ probability value. We also calculated median scale scores with associated 95% CI, as mean ranks approximate the median under a similar distribution. Because the assumption of similar distribution across different mental health wellness strategies was not met throughout these data, our presentation of the median and associated 95% CIs provides an overall picture of data distributions.

## RESULTS

Most respondents identified as female (76.5%) and white (83.6%), which is slightly higher than the university proportions of 63.3% and 76.5%, respectively. Underclass students comprised nearly half ($n$ = 49.82%) of the respondents. Mean respondent age was 24.67 ($SD$ = 8.08). Table 2 shows a detailed breakdown of sex, race/ethnicity, and rank, with associated mean scores by category for resilience and flourishing.

**Table 2**

*Participant Demographics*

| Characteristic | Study Sample | Resilience Score | | Flourishing Score | |
|---|---|---|---|---|---|
| | N (%) | Mean (Std Dev) | *p*-value | Mean (Std Dev) | *p*-value |
| **Age Category** | | | **<.0001** | | **0.0003** |
| 18-21 years | 1927 (55.50) | 3.12 (0.78) | | 45.25 (7.78) | |
| 22-25 years | 723 (20.81) | 3.16 (0.77) | | 45.18 (7.53) | |
| 26-30 years | 354 (10.20) | 3.35 (0.78) | | 46.00 (7.00) | |
| 31 or older years | 469 (13.50) | 3.57 (0.79) | | 46.79 (7.84) | |
| **Gender** | | | **<.0001** | | **<.0001** |
| Female | 2657 (76.50) | 3.18 (0.79) | | 45.76 (7.58) | |
| Male | 687 (19.78) | 3.39 (0.78) | | 45.67 (7.35) | |
| Other * | 87 (2.51) | 2.76 (0.90) | | 38.02 (9.16) | |
| No response | 42 (1.21) | 3.31 (0.74) | | 43.52 (7.76) | |
| **Race/ethnicity** | | | 0.6355 | | 0.2626 |
| White | 2904 (83.62) | 3.21 (0.81) | | 45.61 (7.62) | |
| Black | 168 (4.84) | 3.27 (0.71) | | 45.20 (8.35) | |
| Other $^{\epsilon}$ | 198 (5.70) | 3.17 (0.76) | | 44.53 (7.80) | |

| | | | | | |
|---|---|---|---|---|---|
| Not Reported | 203 (5.85) | 3.23 (0.77) | | 45.51 (7.73) | |
| **Online Student** | | | 0.0814 | | **0.0165** |
| Yes | 952 (27.41) | 3.18 (0.82) | | 44.78 (8.24) | |
| No | 2483 (71.49) | 3.22 (0.79) | | 45.80 (7.45) | |
| No response | 38 (1.09) | 3.45 (0.72) | | 45.95 (6.39) | |
| **International Student** | | | 0.7645 | | 0.9477 |
| Yes | 114 (3.28) | 3.26 (0.74) | | 45.32 (8.18) | |
| No | 3303 (95.11) | 3.21 (0.80) | | 45.53 (7.67) | |
| No response | 56 (1.61) | 3.25 (0.75) | | 45.36 (7.07) | |
| **Academic level** | | | **<.0001** | | **<.0001** |
| Undergraduate | 2809 (80.88) | 3.17 (0.79) | | 45.23 (7.79) | |
| Graduate[¥] | 664 (19.12) | 3.38 (0.80) | | 46.77 (7.06) | |
| **Academic rank** | | | **<.0001** | | **0.0002** |
| Freshman | 936 (26.9) | 3.17 (0.78) | | 45.32 (7.50) | |
| Sophomore | 796 (22.9) | 3.14 (0.80) | | 45.08 (45.08) | |
| Junior | 632 (18.2) | 3.19 (0.80) | | 45.49 (45.49) | |
| Senior | 445 (12.8) | 3.19 (0.80) | | 44.94 (44.94) | |
| Graduate | 592 (17.0) | 3.37 (0.80) | | 46.69 (46.69) | |
| Medical student | 72 (2.1) | 3.52 (0.77) | | 47.46 (47.46) | |

*Note*. *p*-value from ANOVA

*Other gender = additional category; female, additional category; female, genderqueer; female, trans female; genderqueer; genderqueer, additional category; male, female; male, trans male; trans female; trans male; trans male, additional category.

[¢]Other race = American Indian or Alaska Native; Not Reported; Native Hawaiian or Other Pacific Islander; Asian; multiracial.

[¥]Graduate = Graduate; Post-Graduate.

The mean BRS score was 3.21 (*SD* = .798) with a median score of 3.17. The mean FS score was 45.52 (*SD* = 7.68) with a median score of 47. The two most frequently reported coping strategies were engagement in exercise or physical activity (20.5%; coded EX), followed by socializing and maintaining virtual contact with others (14.6%; coded SC). The two coping strategies that were least often reported by respondents were substance use (0.75%; coded SU) and complying with COVID-19-associated guidelines (0.2%, coded COMPLY). Table 3 shows the frequency of each coping strategy identified by respondents and corresponding median BRS and FS scores.

**Table 3**

*Frequency of Occurrence of Categories of Primary Activities Engaged in for Mental Wellness and Respective Median Resilience Score (BRS) and Flourishing Scale and associated 95% CI Among 3473 College Students*

| | | Resilience Score (BRS) | | Flourishing Scale | |
|---|---|---|---|---|---|
| **Activity** | **N (%)** | **Median** | **95% CI** | **Median** | **95% CI** |
| EX | 712 (20.50) | 3.33 | (3.33 - 3.33) | 48 | (48.00 - 49.00) |
| SC | 507 (14.60) | 3.33 | (3.17 - 3.33) | 48 | (47.00 - 48.00) |
| IP | 401 (11.55) | 3.17 | (3.17 - 3.33) | 47 | (47.00 - 48.00) |
| MEDIA | 367 (10.57 | 3.17 | (3.00 - 3.33) | 45 | (45.00 - 46.00) |
| RELAX | 339 (9.76) | 3.17 | (3.00 - 3.33) | 46 | (46.00 - 48.00) |
| RESP | 274 (7.89) | 3.33 | (3.17 - 3.50) | 47 | (46.00 - 48.00) |
| MH | 176 (5.07) | 3 | (2.83 - 3.17) | 44 | (42.00 - 46.00) |
| CE | 162 (4.66) | 3.17 | (3.00 - 3.33) | 47 | (46.00 - 48.00) |
| MULTI | 158 (4.55) | 3.42 | (3.17 - 3.50) | 48.5 | (47.00 - 50.00) |
| SPIR | 93 (2.68) | 3.67 | (3.33 - 3.83) | 49 | (48.00 - 50.00) |
| NONE | 72 (2.07) | 3 | (2.67 - 3.17) | 41 | (38.00 - 44.00) |
| PETS | 58 (1.67) | 3.17 | (2.67 - 3.67) | 47 | (43.00 - 49.00) |
| PHYS | 40 (1.15) | 3.33 | (3.00 - 3.67) | 47 | (40.00 - 48.00) |
| AVOID | 40 (1.15) | 3 | (2.50 - 3.50) | 45.5 | (41.00 - 47.00) |
| OTHER | 38 (1.09) | 3.09 | (2.67 - 3.33) | 40 | (32.00 - 45.00) |
| SU | 26 (0.75) | 2.59 | (2.17 - 3.00) | 44.5 | (39.00 - 48.00) |
| COMPLY | 7 (0.20) | 3.67 | (3.00 - 4.33) | 50 | (37.00 - 55.00) |

*Note.* No response was $n = 3$(.09 %).

**Table 4**

*Wilcoxon Scores (Rank Sums) for Resilience Score (BRS) and Flourishing Scale Classified by Primary Activity*

| | | Resilience Score (BRS) | | | | Flourishing Scale | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **N** | **Sum Scores** | **Expected Under H0** | **SD Under H0** | **Mean Score** | **Sum Scores** | **Expected Under H0** | **SD Under H0** | **Mean Score** |
| EX | 712 | 1319049 | 1235676 | 23778.4 | 1852.6 | 1406445 | 1235676 | 23798.9 | 1975.34 |
| SC | 507 | 896471 | 879899 | 20797.7 | 1768.19 | 916319 | 879899 | 20815.6 | 1807.33 |
| IP | 401 | 694688 | 695936 | 18824.2 | 1732.39 | 706829 | 695936 | 18840.4 | 1762.67 |
| MEDIA | 367 | 606752 | 636929 | 18107.9 | 1653.28 | 546933 | 636929 | 18123.6 | 1490.28 |
| RELAX | 339 | 541840 | 588335 | 17481.8 | 1598.35 | 557874 | 588335 | 17496.9 | 1645.64 |
| RESP | 274 | 513233 | 475527 | 15879 | 1873.11 | 477869 | 475527 | 15892.7 | 1744.05 |
| MH | 176 | 250973 | 305448 | 12920 | 1425.98 | 236944 | 305448 | 12931.2 | 1346.27 |
| CE | 162 | 278720 | 281151 | 12421.8 | 1720.49 | 272985 | 281151 | 12432.5 | 1685.09 |
| MULTI | 158 | 299321 | 274209 | 12274.9 | 1894.43 | 317693 | 274209 | 12285.5 | 2010.71 |
| SPIR | 93 | 191622 | 161402 | 9509.37 | 2060.45 | 193967 | 161402 | 9517.58 | 2085.66 |
| NONE | 72 | 101986 | 124956 | 8393.11 | 1416.47 | 82700.5 | 124956 | 8400.35 | 1148.62 |
| PETS | 58 | 97040 | 100659 | 7548.55 | 1673.1 | 101105 | 100659 | 7555.06 | 1743.19 |
| PHYS | 40 | 72372 | 69420 | 6285.24 | 1809.3 | 62360.5 | 69420 | 6290.67 | 1559.01 |
| AVOID | 40 | 59209 | 69420 | 6285.24 | 1480.23 | 54509.5 | 69420 | 6290.67 | 1362.74 |
| OTHER | 38 | 57156.5 | 65949 | 6127.88 | 1504.12 | 38660 | 65949 | 6133.17 | 1017.37 |
| SU | 26 | 25762.5 | 45123 | 5077.65 | 990.865 | 32904 | 45123 | 5082.04 | 1265.54 |
| COMPLY | 7 | 15992 | 12148.5 | 2641.92 | 2284.57 | 16091 | 12148.5 | 2644.2 | 2298.71 |
| ***Kruskal-Wallis Test*** | | **H** (*df*=16) = 84.0777, ***p***<.0001 | | | | **H** (*df*=16) = 178.1570, ***p***<.0001 | | | |

## Coping Strategies and Mental Health Measures

The results of the Kruskal-Wallis test indicated that there was a significant difference in mean ranks of both BRS and FS scores among at least two of the mental health coping strategies. Specific post-hoc comparisons were not conducted because of the small number of observations associated with several coping strategies. Students who reported a primary coping strategy of spirituality (SPIR; Mdn = 3.67, 95% CI [3.33, 3.83]) or compliance with COVID-19 guidelines (COMPLY; Mdn = 3.67, 95% CI [3.00, 4.33]) had the highest median BRS scores. Students who reported substance use (SU; Mdn = 2.59, 95% CI [2.17, 3.00]) as their primary coping strategy had the lowest median BRS scores, with students who reported engaging in mental health support (MH; Mdn =3.00, 95% CI [2.83, 3.17]) or having no coping strategy (NONE) having the next lowest median BRS scores. Comparison of coping strategies with FS scores yielded similar results. Students who reported spirituality (SPIR; Mdn = 49, 95% CI [48, 50]) or compliance with COVID-19 guidelines (COMPLY; Mdn = 50, 95% CI [37, 55]) also had the highest median FS scores. The lowest median FS scores were found among students who reported other coping strategies (OTHER; Md = 40, 95% CI [32, 45]) or no coping strategies (NONE; Mdn = 41, 95% CI [38, 44]). Table 4, also organized in order from most to least frequently identified strategy, shows rank sum scores for BRS and FS by primary activity.

## Qualitative Themes

In addition to the brief descriptions of coping strategies used to maintain mental wellness during the pandemic, we developed three broad themes from the analysis of the lengthy and detailed open responses that were provided by 71 participants.

### *Theme 1: Experiencing Academic Overload*

The largest proportion of detailed responses described issues associated with transition to online or virtual instruction. Student respondents expressed frustration with a lack of academic support resources, emergent expectations regarding type and number of assignments, and weariness with virtual activities in general. One student observed that faculty had "given me more work than what I'd have in [live] class." Another described, "classes are much harder." The online context created additional challenges with some conceptually complex courses (e.g., statistics), while instruction in other subjects (e.g., visual arts) was deemed impossible to recreate virtually. Inability to focus on virtual courses and coursework and avoidance of online school-related activities were also reported. One student noted, "[it is] mentally hard to be on a computer for both [school and work]."

### *Theme 2: Controlling What I can Control*

Student respondents described intentional management of time and tasks. One described segmenting responsibilities into "manageable chunks." Another stated, "(I) created a rigorous routine I follow every single day," while another, acknowledging COVID-associated disruption, described, "trying to stick to some semblance of a routine." Other self-regulation efforts included establishing regular goals, making to-do lists, engaging in projects or learning skills, and setting up a personal system of goals and rewards.

### *Theme 3: Being Strong for Others*

Respondents described a variety of activities related to caregiving and provision of support. The theme title "being strong for others" was derived from an in vivo code that reflected a participant response. Students described how assisting neighbors, relatives, partners, stray animals and "everyone I know" was comforting and sometimes mutually beneficial. One described, "calling [family members] for support and supporting them."

## DISCUSSION

The highest mental health subscale scores were associated with the identified primary mental wellness strategies of engaging spiritual and religious activities or compliance to COVID-19 recommendations, although in terms of frequency, spiritual and religious activities were selected by only 93 (2.7%) of respondents as their primary mental wellness strategy and compliance was selected by less than 1% of respondents. Exercise, the most frequently selected alternative (20.5% of respondents), was also associated with relatively high median scores on the two mental health measures.

Smith et al. (2008) found BRS mean scores of 3.53 (*SD* = 0.68) and 3.57 (*SD* = 0.76) among samples of college students. Although these are higher when compared to our mean BRS score of 3.21 (*SD* = 0.798), Smith et al. (2008) considered BRS scores from 3.0 to 3.4, which encompasses their results and those from this research as normal. Caporale-Berkowitz (2022) administered the BRS to a group of students with and without a history of academic probation and found a mean score of 3.35 (*SD* = .69), also falling within the normal range, suggesting there may limited variability in US- based university student responses across time and contexts. Likewise, the mean FS score of 45.52 (*SD* = 7.68) in the current research is very similar to results reported by Diener et al. (2009). In research with 573 students across five institutions, Diener et al. (2009) found a mean FS score of 45.4 (*SD* = 6.2). In research with university students in South Africa, Graham and Eloff (2022) identified a significant post-pandemic decrease of 6.16 points in FS scores. However, these were comparable and not identical groups of students, and the pre-pandemic mean was 37.96, substantially lower than the scores reported in this research or by Diener et al. in 2009. Unfortunately, because of absent pre-COVID comparison scores for this sample, it is impossible to draw conclusions about COVID-associated changes to these participants in either mental health scale.

The detailed free response comments offered by a smaller number of students described frustrations with online learning and provided potential additional insight into coping strategies. Respondents emphasized the value of engaging in self-regulated, routinized behaviors consistent with the frequently identified wellness strategies of exercise and adherence to COVID-19 recommendations. A unique finding from the detailed responses was the value of "being strong for others," a more outward focused strategy that may be consistent with some individuals' interpretation of their spiritual obligations.

Between the spring semesters of 2020 and 2022, many university operations returned to normal, although emergence of novel COVID-19 variants may continue to indicate modified processes. Universities have for several years considered a variety of ways to meet increased demand for students' mental health services, including information sessions provided at student orientation, free screenings, mindfulness training and other strategies (Eva, 2019). A National Academies of Sciences (2021) report recommended that institutions proactively work towards "holistic understanding" (p. 5) and take responsibility for the "entire culture and environment" (p. 5). Strategies to

improve student wellbeing described in the National Academies of Sciences report include encouraging student-led and other activities where students might interact with peers outside of the classroom, mental health stigma reduction campaigns to encourage help-seeking behaviors, and providing robust support targeted at subgroups of students including students with disabilities, student who are neurodiverse, first generation students, and others who may be at increased risk for challenges to mental health.

The frequency of some coping methods suggests some students may be better prepared to handle disruption when they rely on strategies developed prior to the disruption. Mental health counselors may be well positioned to guide students to develop some of the key strategies identified here, including use of positive self-talk, categorized as "intentional positivity." Other effective strategies might be suggested by the qualitative themes "controlling what I can control" and "being strong for others." In addition, there may be value in proactive efforts to guide students to develop or enhance their repertoire of leisure skills, such as engagement in outdoor physical activity, which has previously been shown to enhance mental health in multiple contexts (Coon et al., 2011), and presents a viable alternative to gym or recreation center exercise during campus closures. One participant described the challenge of relying on screentime for both school and work, which suggests the value of leisure activities not centered on technology.

The transtheroretical model (Prochaska & Velicer, 1997), frequently used to inform health behavior change intervention research (Hashemzadeh et al., 2019), describes behavior change in a series of stages ranging from not thinking about behavior change (precontemplation) to engaging in sustained behavior change (Prochaska & Velicer, 1997). A companion set of processes of change are also described within the model. Participant responses to pandemic-related disruption and stress may align with some of these, including consciousness raising, described as the active pursuit of information to improve health and counter conditioning, or dramatic relief, which occurs when an initial emotional response is countered by engaging in a desirable behavior. Consciousness raising might lead to identification and acquisition of desired behaviors in lieu of less desired behaviors. In the instance of a pandemic, health-promoting behaviors might be acquired based on the expectation that improving overall health may increase resistance or improve outcomes after infection. Active engagement in positive behaviors might also offer dramatic relief by countering negative emotional responses.

What remains to be explored is the extent to which positive or less desirable behavior changes continue over time and how mechanisms that inspired change might be adapted for continued use. The authors are currently working to gather and analyze follow up data to capture this information about behavior change patterns in hope that these data may provide additional insights to guide universities in supporting students to develop and strengthen coping strategies.

Research results and interpretations should be viewed with awareness of limitations to the research process. Although responses were solicited from all students, only a portion of self-selected students responded, so this is not a random sample. A higher proportion of respondents were female and white when compared to the university community overall. Lastly, responses reflect self-report data and the extent to which errors, misunderstandings, or social desirability bias played a role are unknown. Things that potentially enhance credibility include the large sample size and time taken by respondents to provide unstructured, sometimes lengthy responses, to optional survey items.

Given our results, we recommend that American universities may be well served to consider two complimentary strategies. First, we recommend that universities assess, expand, and reallocate resources to ensure ample availability of counseling services in response to disruptions. Weather-related disruptions provide some comparable

circumstances to assess. During fall semester of 2005, Hurricane Katrina resulted in lengthy university closures, disruption of courses and degree programs, and unplanned transfers of students, with a particularly profound impact on students attending Historically Black Colleges and Universities (Johnson & Rainey, 2007). Johnson and Rainey (2007) assessed institutional responses and specifically recommended improvement in ongoing availability of counseling during disruptions to the academic calendar. We identified a variety of support communications to students provided in response to Hurricane Ida-related disruptions in fall of 2021, (Loyola University New Orleans, n.d.; Southern University and Agricultural & Mechanical College, 2021). Although institutions typically included a web contact for counseling and other health services, most institutional communications we identified emphasized resources to support students to continue their academic progress. Therefore, it is possible that Johnson and Rainey's (2007) recommendation regarding emphasis of counseling opportunities during disruption warrants continuing consideration.

Our second recommended strategy is that universities investigate and invest in coping skills development on an ongoing basis, so that students may be better aware of and better equipped to navigate threats to mental health during disruptions. Development of other pre-emptive support services such as training in and enhancement of coping strategies also has the potential to address the ongoing negative trend in results of university student mental health assessments. Investigation of and investment in coping skills development before challenging circumstances occur is important as future pandemics are difficult to predict. There will always be the potential for disruptions to normal university operations. Thus, there is an ongoing need to enhance student coping strategies. Enhancement could occur by providing mental health resources and screenings during orientation, implementing campaigns to reduce stigma, offering programming to enhance leisure skills, ensuring regular availability of counseling, and through novel approaches that students can help develop if given opportunities to do so.

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**Author's Note**

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