

## Beliefs, Mental Health, Healthy Lifestyle Behaviors and Coping Strategies Used by College Students During the COVID-19 Pandemic

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### ABSTRACT

**Background:** The COVID-19 pandemic has added substantial stress to the college student experience that could escalate the already existing student mental health crisis. Institutions of higher education have been called to explore ways in which they can promote and support the whole student.

**Objective:** To describe college students' beliefs about returning to campus, safety practices, mental health, and strategies used to cope with the COVID-19 pandemic.

**Methods:** A descriptive survey was emailed to a stratified random sample of undergraduate, graduate, and professional students ( $N = 14,459$ ) from a large public Mid-west university. The survey measured beliefs about returning to campus and safety practices, mental health status (anxiety, depression, and burnout), and coping strategies used to deal with the stress of the pandemic.

**Results:** The response rate was 30.7%. Thirty percent of students were not confident about returning to campus safely. Thirty-nine percent met the cut-off for clinical anxiety, 24% for depression, and 39.9% for burnout. A substantial percentage used unhealthy lifestyle behaviors to cope with pandemic stress.

**Conclusion:** Institutions of higher education must accelerate mental health screening and services along with evidence-based preventive interventions and wellness programming for students.

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*Keywords:* young adult, wellness, mental health, healthy behaviors, higher education



Prior to the COVID-19 pandemic, an analysis of the World Health Organization's (WHO) World Mental Health Survey determined that 20.3% of college students had a mental health condition (e.g., anxiety, substance use, mood disorder) and, among the 20.3% affected, 83.1% entered college with an already existing diagnosis (Auerbach et al., 2016). Being in a transitional stage of life, college students face numerous stressors that place them at risk for the development of a mental health disorder or exacerbation of an already existing one. COVID-19 has added to the amount of stress that students experience, and institutions of higher education (IHE) are being called to explore ways in which they can promote and support student mental health, including supporting the whole student (National Academies of Sciences, Engineering, and Medicine, 2021).

Wellness is an all-encompassing term used to describe a holistic approach to health. Reaching a state of wellness requires an individual to actively pursue a lifestyle that is beneficial to both their mental and physical well-being. However, the pursuit of wellness can be hindered by an individual's culture and environment. In the context of IHE COVID-19 restrictions and guidelines, student wellness has likely been impacted.

COVID-19 has caused considerable uncertainty in terms of financial security, personal and family health, and future planning. As of June 2020, the prevalence of anxiety disorders in adults was three times higher and the prevalence of depression was four times higher than values reported in the second quarter of 2019 (Czeisler et al., 2020). When compared to the general population, young adults (aged 18-24 years) more frequently reported anxiety and depressive disorders, COVID-19 related trauma and stressor-related disorders, increased substance use to deal with COVID-19 stress, and suicidal ideation. Specifically, 25% of 18 to 24-year-olds in Czeisler et al. (2020) considered suicide since the start of the pandemic. Furthermore, a survey of 30,725 undergraduate students and 15,346 graduate/professional students from nine public universities also reported prevalence increases in depression (1.5x higher) and anxiety (2x higher) from 2019 (Chirikov et al., 2020). In terms of physical health, sedentary behaviors (e.g., watching TV, eating, and using electronic devices) has significantly increased and physical activity has significantly decreased in college aged students since the start of the pandemic (Gallè et al., 2020; Zheng et al., 2020). This is concerning as physical activity has a significant impact on alleviating depression (Kvam, Kleppe, Nordhus, & Hovland, 2016) and anxiety (Stonerock, Hoffman, Smith, & Blumenthal, 2015), both of which have skyrocketed during COVID-19.

In a multinational cross-sectional study with 21,369 college age students, stressors that impacted college student wellness generally fell into six categories: financial, personal health, love life, familial relationships, school relationships, and problems with loved ones (Karyotaki et al., 2020). Stress related to school relationships was significant in predicting depressive disorder, bipolar disorder, and generalized anxiety disorder, thus highlighting the important role that school environment plays in the well-being of students. School relationships play a larger role in the overall climate (i.e., culture) of the school as does the concept of school safety (Aldrige & McChesney, 2018). From the student perspective, the COVID-19 pandemic has made campuses less safe because of how easily the disease transmits (Zhai & Du, 2020).

Addressing the IHE student mental health crisis during and after COVID-19 will require a multicomponent intervention strategy as student mental health and overall wellness are impacted by various factors, some of which are controllable by individual-level action and others which are not. The current study was guided by the nine dimensions of wellness (Melnik & Neale, 2018) and the Socioecological Framework as described by the seminal McLeroy, Steckler, and Bibeau (1988) publication. The nine dimensions of wellness posits that wellness expands beyond the physical and mental to also include financial, intellectual, career, social, creative, environmental, and spiritual wellness.

The Socioecological Framework emphasizes that an individual's health and ability to practice healthy behaviors are dependent on both the individual and their environment (social networks, institutions, community, and public policy). Using both frameworks could ultimately provide a comprehensive understanding of college students' overall wellness to guide university wellness services and programming related to COVID-19.

## **Purpose and Relevance**

The purpose of this cross sectional study, performed by the Safe Campus & Scientific Advisory Subgroup of the Post-Pandemic Operations Task Force at a large, multi-campus, Mid-west public university was to determine students' (1) readiness for returning to campus; (2) beliefs about safety practices; (3) mental health and well-being status; (4) healthy lifestyle behavior practices; (5) COVID-19 coping strategies; and (6) COVID-19 concerns and needs, including interest in University sponsored programming on health and wellness.

As stewards in assisting students with their education, health, and safety needs (Zhai & Du, 2020), IHE must provide extensive wellness services in addition to guidelines for mitigating COVID-19 transmission. To create appropriate policies and guidelines to mitigate the negative impacts of the COVID-19 pandemic, IHE must establish the current status of student wellness and address the gaps with evidence-based programming and interventions.

## **METHODS**

### **Study Setting**

This study took place at large Mid-west public university that has six campuses located throughout the state. Over 68,000 students are enrolled at the University, with most students (61,391) being enrolled at the central campus. The University's Chief Wellness Officer, co-chair of the Safe Campus and Scientific Advisory Sub-group, convened a group of experts from the University's One University Health and Wellness Council, the Office of Student Life, and the Office of Institutional Strategic Planning to develop the student survey.

### **Recruitment**

An invitation to complete the survey was sent to a stratified random sample of students ( $N = 14,459$ ) prior to the fall 2020 semester to assess their readiness for returning to campus, beliefs about safety practices (e.g., mask wearing and physical distancing), their mental health and wellness status, healthy lifestyle behavior practices, COVID-19 coping strategies, and specific COVID-19 concerns and needs, including interest in University sponsored programming on health and wellness. Exempt status for the confidential survey was obtained through the University's Institutional Review Board.

## Measures: The Return to Campus Survey

Demographic questions (e.g., age, gender, academic level, race, and campus location) and the following sections were included in the survey.

**Beliefs about returning to campus and safety practices.** Likert-type questions (*not at all, a little, somewhat, moderately so, and very much so*) were used to measure beliefs about returning to campus and safe practices to prevent COVID-19 spread. Belief questions included “I am confident we can return to campus safely,” “I believe peers at my university will follow appropriate safety protocols when they return to campus,” and “How willing are you to follow evidence-based guidelines on preventing the spread of COVID-19 when returning to campus?”

**Burnout.** The survey assessed burnout with a valid 1-item measure that asked “Overall, based on your definition of burnout, how would you rate your level of burnout?” A five-category ordinal scale is used to score the responses: 1 = *no symptoms*; 2 = *occasional stress, but don't feel burned out*; 3 = *definitely burning out and am experiencing physical or emotion exhaustion*; 4 = *symptoms of burnout won't go away*; and 5 = *I feel completely burned out and often wonder if I can go on* (Dolan et al., 2015). A positive score for burnout is  $\geq 3$ .

**Anxiety.** The valid and reliable GAD-2 scale measured self-reported clinical anxiety (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007). The 2-item questionnaire asks participants about experiencing symptoms of anxiety (feeling nervous, anxious, or on edge; and not being able to stop or control worrying) over the past two weeks. Participants respond to the questions using a four-point Likert-type scale with scores ranging from 0 (*not at all*) to 3 (*nearly every day*). Response scores are totaled and a score  $\geq 3$  indicates a clinically significant finding for anxiety. In prior studies, Cronbach's alpha were reported as 0.76 to 0.81 (Melnik et al., 2021; Staples et al., 2019). In this study sample, the Cronbach's alpha was 0.81.

**Depression.** The valid and reliable PHQ-2 measures self-reported depression (Kroenke, Spitzer, & Williams, 2003). It contains questions about experiencing symptoms of depression (little interest or pleasure in doing things and feeling down, depressed, or hopeless) over the past two weeks. Participants respond to the questions using a four-point Likert-type scale with scores ranging from 0 (*not at all*) to 3 (*nearly every day*). Response scores are totaled and a score  $\geq 3$  indicates a clinically significant finding of depression. In prior studies, Cronbach's alpha were reported as 0.76 to 0.83 (Melnik et al., 2021; Staples et al., 2019). In this study sample, the Cronbach's alpha was 0.73.

**Healthy lifestyle behaviors.** Additional Likert-type questions were used to assess healthy lifestyle behaviors in terms of changes in amount daily physical activity (*the same, less than usual, more than usual*); eating patterns (*the same, less healthy, more healthy*); and amount of sleep (*the same, less than usual, more than usual*). Also included was a select all that apply question to determine what students were using to cope with COVID-19: engaged in wellness programs offered by the University; increased the use of tobacco/vaping products; increased use of alcohol; had sessions with a mental health counselor; had sessions with a health and wellness coach; connected with friends/family; volunteered; did kind things for others; learned a new skill; engaged in a personal spiritual practice; increased my physical activity; ate more or increased my consumption of unhealthy types of food; increased sleep; practiced mindfulness; used gratitude; other; and none of the above.

**Virtual programming and services: Accessibility, interest, and utilization.** Likert-type questions (*strongly disagree, disagree, neither disagree or agree, agree, strongly agree*) were used to assess students' intent to use university

programming on health and wellness topics; ability to access virtual programming; satisfaction with the amount of virtual programming offered; use of virtual programming prior to COVID-19; and future use of virtual programming.

### **Statistical Analysis**

Descriptive statistics summarized students' demographics, beliefs about returning to campus (including safety practices and concerns), perceptions of virtual programming and services, mental health (anxiety, depression, and burnout), changes in healthy lifestyle behaviors during the pandemic, and coping strategies used to deal with COVID-19. Chi-Square tests compared key variables (beliefs about returning to campus safely, positive screenings for anxiety, and positive screenings for depression) by type of student (professional, graduate, central campus undergraduate, and regional campus undergraduate students), and race/ethnicity (non-Hispanic White, Black/African American, Asian/Pacific Islander, and Other). Participants who selected Native American/American Indian/Alaskan Native or Middle Eastern/Arab American were grouped together for analysis under the heading "Other" as these categories were too small to yield reliable results alone. SAS version 9.4 was used for all analyses.

## **RESULTS**

The survey obtained responses from 4,441 students, a 30.7% response rate. Most students were 22.4 years-of-age ( $SD = 5.0$ ), female (61%), non-Hispanic White (71%), and at the undergraduate level (76.6%). A full listing of student characteristics can be found in Table 1.

**Table 1.** *Student Characteristics* (n = 4,441)

<b>Characteristics</b>	<b>N</b>	<b>%</b>
<b>Age (Mean ± SD: 22.4 ± 5.0)</b>		
<20	1135	25.6
21-24	2355	53.0
25-29	554	12.5
30-39	224	5.0
40+	85	2.0
Missing	88	2.0
<b>Gender</b>		
Man	1620	36.5
Woman	2711	61.0
Other	52	1.2
Missing	58	1.3
<b>Race/Ethnicity</b>		
Non-Hispanic White	3153	71.0
African American	269	6.1
Asian/Pacific Islander (including Hawaiian)	561	12.6
Hispanic / Latino	215	4.8
Other (including Native American/American Indian/Alaskan Native and Middle Eastern/Arab American)	94	2.1
Missing	149	3.4
<b>Academic level</b>		
Professional <sup>§</sup>	382	8.6
Graduate <sup>§</sup>	657	14.8
Undergraduate, Central Campus	2522	56.8
Undergraduate, Regional Campus	880	19.8
<b>Year(s) in school (undergraduate students only, n = 3412)</b>		
1	27	0.8
2	1231	36.1
3	959	28.1
4	892	26.1
5	275	8.1
missing	28	0.8

*Note.* <sup>§</sup>All professional and graduate students were located at the central campus location.

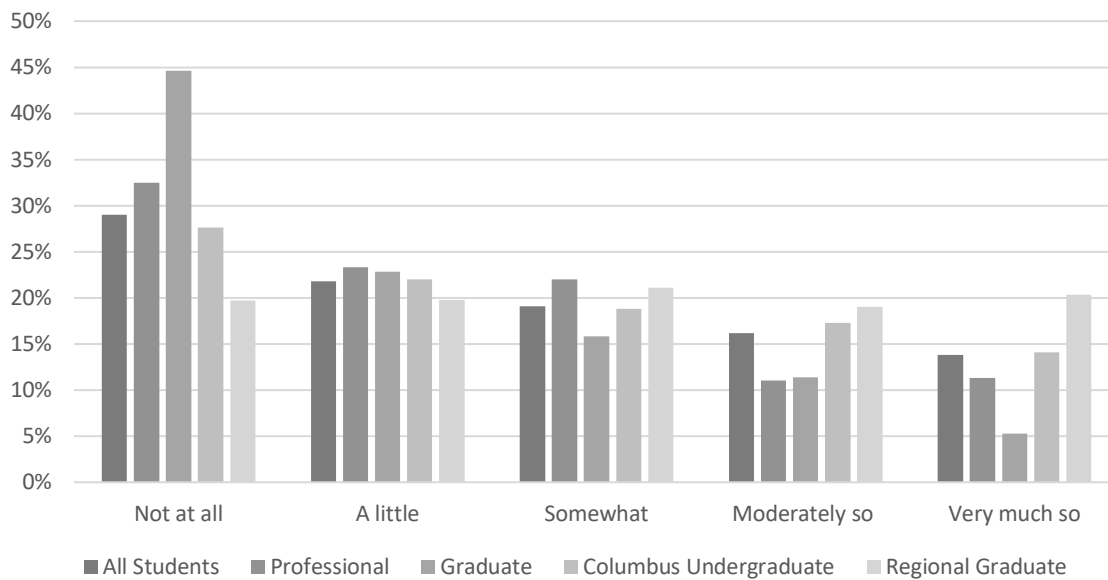
### Return to Campus Beliefs of Students

Almost 30% of all students were not at all confident about being able to return to campus safely, however, 49% were at least somewhat confident when combining the responses of “somewhat” with “moderately so” and “very much so” (Table 2).

**Table 2.** *Beliefs on Returning to Campus*

	All (n = 4441)		Professional Students (n = 382)		Graduate Students (n = 657)		Central Campus Undergraduate Students (n = 2522)		Regional Campus Undergraduate Students (n = 880)	
	N	%	N	%	N	%	N	%	N	%
<b>I am confident that we can return to campus safely</b>										
Not at all	1286	29.0	124	32.5	293	44.6	696	27.6	173	19.7
A little	969	21.8	89	23.3	150	22.8	556	22.0	174	19.8
Somewhat	849	19.1	84	22.0	104	15.8	475	18.8	186	21.1
Moderately so	721	16.2	42	11.0	75	11.4	437	17.3	167	19.0
Very much so	612	13.8	43	11.3	35	5.3	355	14.1	179	20.3
Missing	4	0.1	0	0.0	0	0.0	3	0.1	1	0.1
<b>I believe appropriate safety protocols will be in place when I return to campus</b>										
Not at all	349	7.9	30	7.9	88	13.4	195	7.7	36	4.1
A little	780	17.6	72	18.8	160	24.4	443	17.6	105	11.9
Somewhat	900	20.3	102	26.7	146	22.2	500	19.8	152	17.3
Moderately so	1217	27.4	90	23.6	151	23.0	717	28.4	259	29.4
Very much so	1187	26.7	88	23.0	111	16.9	661	26.2	327	37.2
Missing	8	0.2	0	0.0	1	0.2	6	0.2	1	0.1
<b>I believe there will be clear communication from the University regarding specific guidelines/protocols to follow as we transition back to campus</b>										
Not at all	378	8.5	38	9.9	76	11.6	231	9.2	33	3.8
A little	662	14.9	72	18.8	102	15.5	390	15.5	98	11.1
Somewhat	882	19.9	83	21.7	134	20.4	517	20.5	148	16.8
Moderately so	1204	27.1	102	26.7	171	26.0	694	27.5	237	26.9
Very much so	1310	29.5	87	22.8	173	26.3	687	27.2	363	41.3
Missing	5	0.1	0	0.0	1	0.2	3	0.1	1	0.1
<b>I believe peers at the University will follow appropriate safety protocols when they return to campus.</b>										
Not at all	1503	33.8	134	35.1	247	37.6	900	35.7	222	25.2
A little	1129	25.4	107	28.0	187	28.5	645	25.6	190	21.6
Somewhat	905	20.4	77	20.2	117	17.8	496	19.7	215	24.4
Moderately so	581	13.1	41	10.7	73	11.1	305	12.1	162	18.4
Very much so	318	7.2	23	6.0	32	4.9	173	6.9	90	10.2
Missing	5	0.1	0	0.0	1	0.2	3	0.1	1	0.1
<b>I am ready to come back to campus</b>										
Not at all	851	19.2	73	19.1	209	31.8	415	16.5	154	17.5
A little	620	14.0	65	17.0	131	19.9	300	11.9	124	14.1
Somewhat	665	15.0	88	23.0	105	16.0	346	13.7	126	14.3
Moderately so	655	14.7	59	15.4	99	15.1	374	14.8	123	14.0
Very much so	1648	37.1	97	25.4	113	17.2	1085	43.0	353	40.1
Missing	2	0.0	0	0.0	0	0.0	2	0.1	0	0.0

Graduate students were significantly less confident about returning to campus safely ( $p < 0.001$ ; Figure 1) when compared to other academic levels. In terms of race/ethnicity, ethnic and racial diversity populations (African American/Black [36%], Asian/Pacific Islander [40%], Hispanic [34%], and Other [47%]) had significantly higher ( $p < 0.001$ ) rates of reporting “not at all confident” about returning to campus than non-Hispanic White students (25%), with those grouped in the other category having the least amount of confidence.

**Figure 1.** Level of Student Confidence in Being Able to Return to Campus Safely by Type of Student

*Figure 1.* Level of confidence for returning to campus was assessed by asking “How confident are you about returning to campus safely?” Group differences were assessed via a Chi Square test. Graduate students had significantly more stress over finance than the other academic levels ( $p < 0.001$ ).

In terms of student beliefs about proper safety protocols being in place when they return to campus, approximately three quarters (74%) at least somewhat believed such protocols would be present, with regional campus undergraduates holding the highest beliefs. In a similar manner, regional campus undergraduates expressed more confidence about receiving clear communication from the University than the other types of students. Only 37.1% of students reported “very much so” being ready to return to campus (Table 2).

A large proportion of students reported having some level of concern about contracting COVID-19 once returning to campus, with as few as 12.3% voicing no concern at all. Only 40% of students reported “somewhat” believing that their University peers would follow the appropriate safety protocols. Regional campus undergraduate students had higher beliefs regarding their peers following appropriate safety protocols. Overall, students expressed the most concern about contracting COVID-19 (58.3%), passing COVID-19 on to their family/loved ones (64.9%), and their own level of anxiety or stress (48.1%; Table 3).



**Table 3.** *Concerns about Returning to Campus*

	All (n = 4441)		Professional Students (n = 382)		Graduate Students (n = 657)		Central Campus Undergraduate Students (n = 2522)		Regional Campus Undergraduate Students (n = 880)	
	N	%	N	%	N	%	N	%	N	%
<b>How concerned are you about getting COVID-19 once we return to campus?</b>										
Not at all	547	12.3	31	8.1	27	4.1	307	12.2	182	20.7
A little	672	15.1	55	14.4	76	11.6	413	16.4	128	14.5
Somewhat	897	20.2	79	20.7	124	18.9	500	19.8	194	22.0
Moderately so	967	21.8	108	28.3	137	20.9	542	21.5	180	20.5
Very much so	1355	30.5	109	28.5	293	44.6	757	30.0	196	22.3
Missing	3	0.1	0	0.0	0	0.0	3	0.1	0	0.0
<b>What are your greatest concerns about returning to campus? (Please check all that apply)</b>										
Contracting COVID-19	2588	58.3	235	61.5	458	69.7	1455	57.7	440	50.0
Passing COVID-19 on to my family/loved ones	2880	64.9	261	68.3	430	65.4	1629	64.6	560	63.6
Childcare for my children	100	2.3	10	2.6	34	5.2	22	0.9	34	3.9
Use of public transportation	1003	22.6	62	16.2	215	32.7	655	26.0	71	8.1
Colleagues who may not follow protocols that will keep me safe	2913	65.6	270	70.7	504	76.7	1641	65.1	498	56.6
Other members of the University community who may not follow protocols that will keep me safe	2310	52.0	209	54.7	450	68.5	1312	52.0	339	38.5
How I will take care of a family member after I return to campus	275	6.2	16	4.2	56	8.5	144	5.7	59	6.7
My anxiety/level of stress	2136	48.1	177	46.3	329	50.1	1220	48.4	410	46.6
I am not comfortable coming back to campus and would prefer to work from home	1205	27.1	91	23.8	268	40.8	615	24.4	231	26.3
Other	517	11.6	49	12.8	51	7.8	301	11.9	116	13.2

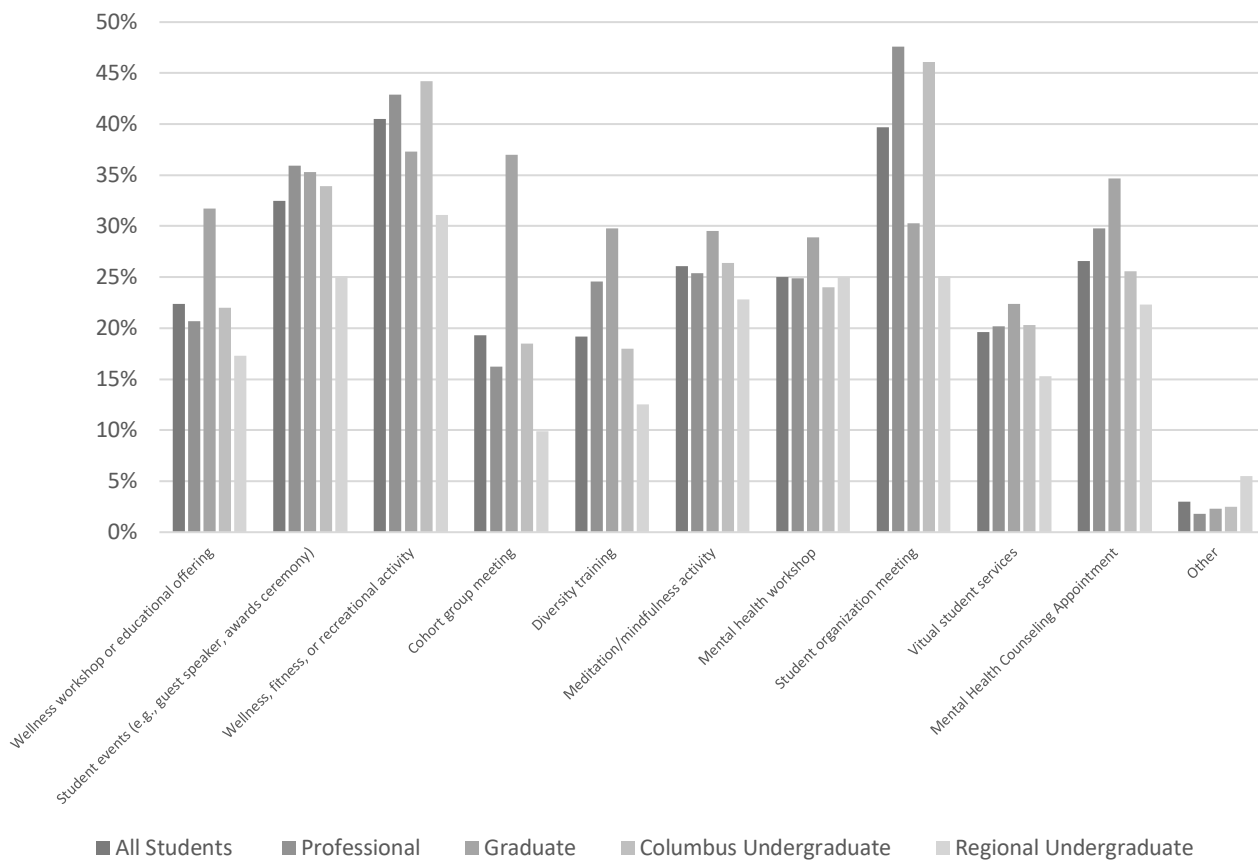
Although less than 50% of students believed that they knew how to best prevent the spread of COVID-19, students reported strong beliefs in the importance of physical distancing and mask wearing with more than 60% indicating that they believed in these preventative measures “a lot.” Although only 34.7% of students believed that daily health screenings were a critical preventive measure, 77.2% of students were very willing to follow evidence-based guidelines for prevention when returning to campus (Table 4).

**Table 4.** *Beliefs on COVID-19 Prevention Procedures*

	All (n = 4441)		Professional Students (n = 382)		Graduate Students (n=657)		Central Campus Undergraduate Students (n = 2522)		Regional Campus Undergraduate Students (n = 880)	
	N	%	N	%	N	%	N	%	N	%
<b>I know how best to prevent the spread of COVID-19 once we return to campus.</b>										
Not at all	107	2.4	10	2.6	26	4.0	53	2.1	18	2.0
A little	231	5.2	27	7.1	53	8.1	112	4.4	39	4.4
Somewhat	575	12.9	54	14.1	105	16.0	315	12.5	101	11.5
Moderately so	1637	36.9	144	37.7	243	37.0	957	37.9	293	33.3
Very much so	1887	42.5	147	38.5	229	34.9	1083	42.9	428	48.6
Missing	4	0.1	0	0.0	1	0.2	2	0.1	1	0.1
<b>How much do you believe physical distancing is critical in preventing the spread of COVID-19?</b>										
Not at all	115	2.6	.	.	5	0.8	52	2.1	58	6.6
A little	228	5.1	11	2.9	20	3.0	123	4.9	74	8.4
Somewhat	477	10.7	33	8.6	37	5.6	257	10.2	150	17.0
Moderately	900	20.3	69	18.1	78	11.9	531	21.1	222	25.2
A lot	2715	61.1	268	70.2	517	78.7	1556	61.7	374	42.5
Missing	6	0.1	1	0.3	0	0.0	3	0.1	2	0.2
<b>How much do you believe wearing a mask is critical in preventing the spread of COVID-19?</b>										
Not at all	175	3.9	4	1.0	6	0.9	71	2.8	94	10.7
A little	187	4.2	8	2.1	8	1.2	90	3.6	81	9.2
Somewhat	344	7.7	19	5.0	22	3.3	171	6.8	132	15.0
Moderately	711	16.0	63	16.5	69	10.5	407	16.1	172	19.5
A lot	3018	68.0	286	74.9	551	83.9	1781	70.6	400	45.5
Missing	6	0.1	2	0.5	1	0.2	2	0.1	1	0.1
<b>How much do you believe daily health screenings (for example, temperature checks) are critical in preventing the spread of COVID-19?</b>										
Not at all	282	6.3	15	3.9	27	4.1	157	6.2	83	9.4
A little	494	11.1	39	10.2	57	8.7	270	10.7	128	14.5
Some what	864	19.5	92	24.1	118	18.0	475	18.8	179	20.3
Moderately so	1255	28.3	110	28.8	172	26.2	749	29.7	224	25.5
Very much so	1540	34.7	125	32.7	283	43.1	868	34.4	264	30.0
Missing	6	0.1	1	0.3	0	0.0	3	0.1	2	0.2
<b>How willing are you to follow evidence-based guidelines/recommendations on preventing the spread of COVID-19 when coming back to campus (for example, 6feet distancing, wearing a mask)?</b>										
Not at all	48	1.1	3	0.8	3	0.5	21	0.8	21	2.4
A little	90	2.0	4	1.0	2	0.3	50	2.0	34	3.9
Some what	208	4.7	10	2.6	10	1.5	106	4.2	82	9.3
Moderately so	662	14.9	36	9.4	43	6.5	394	15.6	189	21.5
Very much so	3430	77.2	329	86.1	599	91.2	1948	77.2	554	63.0
Missing	3	0.1	0	0.0	0	0.0	3	0.1	0	0.0

Of the programming available, students expressed the most interest in wellness, fitness, or recreational activity; student organization meetings; and student events (e.g., guest speaker, awards ceremony; Figure 2). Approximately a quarter also expressed interest in meditation/mindfulness activities, mental health workshops or programs on stress reduction and coping, and accessing a mental health counseling appointment.

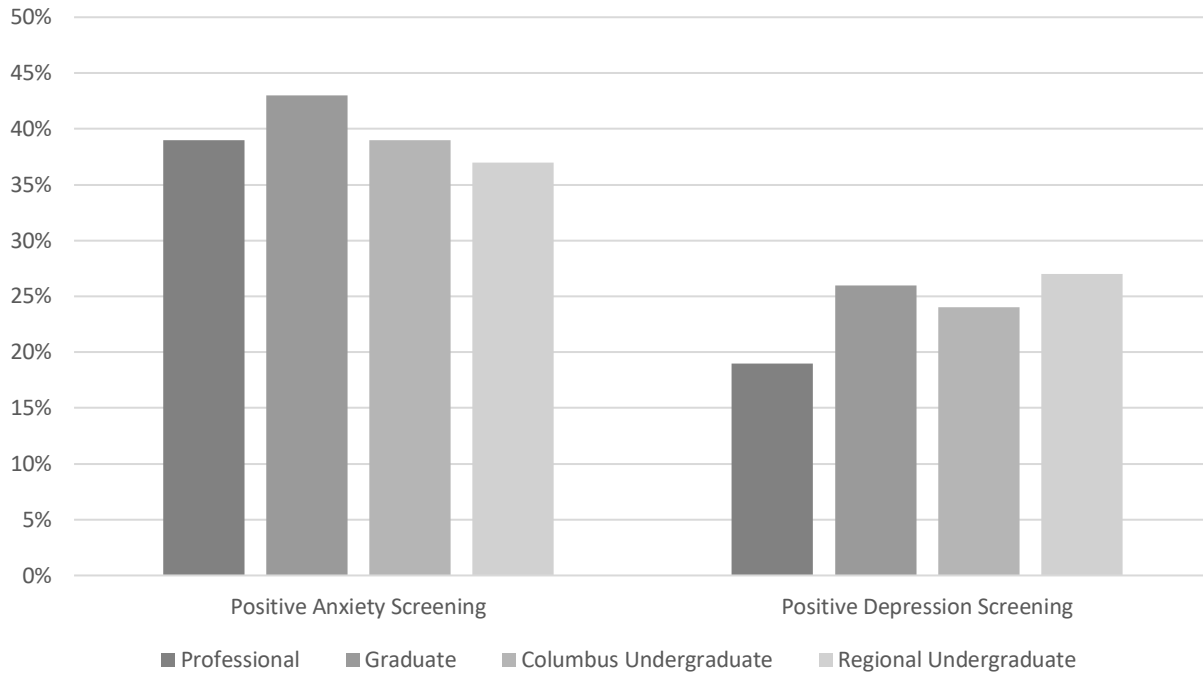
**Figure 2.** Type of Virtual Health and Wellness Offerings that Students Intend to Participate in After Returning to Campus



*Figure 2.* The university offers a variety of online programming to promote social connection, student engagement with the university, and mental wellness. Students were asked to select all programs that they intended to participate in, thus, the percentages total > 100.

### Mental Health and Coping Strategies

Thirty-nine percent of the students screened positive for generalized anxiety disorder and 24.1% screened positive for depression. Figure 3 shows the prevalence of positive anxiety and depression screenings by academic level. There was no significant difference between academic level and a positive GAD-2 screening ( $p = 0.128$ ). In terms of depression, regional campus undergraduates had significantly higher rates of depression (27% with PHQ-2  $\geq 3$ ;  $p = 0.023$ ) than professional students, graduate students, and central campus undergraduates.

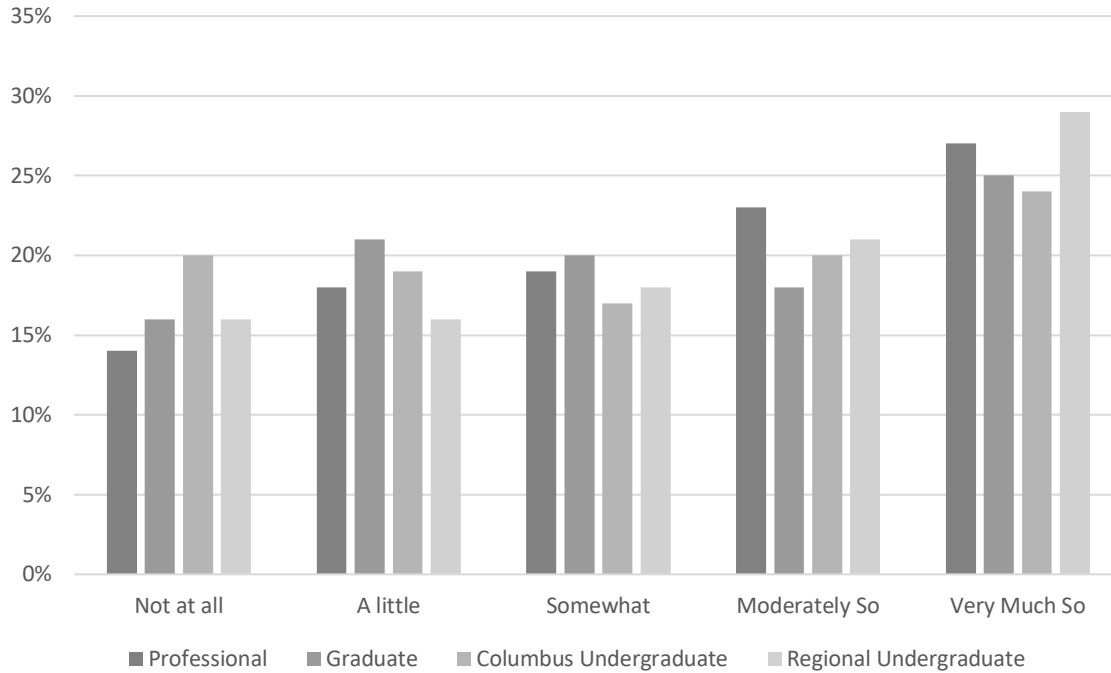
**Figure 3.** Anxiety and Depression in Students by Academic Program

*Figure 3.* Clinically significant levels of depression and anxiety were assessed in this student population through use of the Patient Health Questionnaire 2-Item Scale and the Generalized Anxiety Disorder 2-Item scale. Students who scored  $\geq 3$  on the scales were considered to have a “positive” screening. Group differences were assessed via a Chi Square test. There was no significant difference between academic level and a positive GAD-2 screening ( $p = 0.128$ ) or positive PHQ-2 screening ( $p = 0.023$ ).

When anxiety and depression were analyzed by student race/ethnicity, Hispanic students reported significantly more anxiety (48%;  $p = 0.012$ ) than the Non-Hispanic White (39%), Black/African American (40%), Asian/Pacific Islander (35%), and Other students (46%). All minority students (Black/African American [32%]; Asian/Pacific Islander [27%]; Hispanic [32%]; and Other [32%]) reported significantly more depression ( $p < 0.001$ ) than the Non-Hispanic White students (22%).

Results from the 1-item burnout question indicated that 39.9% of students were experiencing burnout (29% of students had at least 1+ symptom of burnout; 8.2% had symptoms that would not go away; and 2.5% felt completely burnout out and often wondered if they could go on).

Sixteen percent of students indicated having no stress about returning to campus. As few as 14% indicated no stress over finances and regional campus undergraduates had significantly higher levels of financial stress when compared to the other academic levels ( $p = 0.002$ ; Figure 4).

**Figure 4.** Stress Over Finances by Academic Level

*Figure 4.* Stress over finances were assessed in this student population by asking “How much stress are you currently feeling over finances?” Group differences were assessed via a Chi Square test. Regional undergraduate students had significantly more stress over finance than the other academic levels ( $p = 0.002$ ).

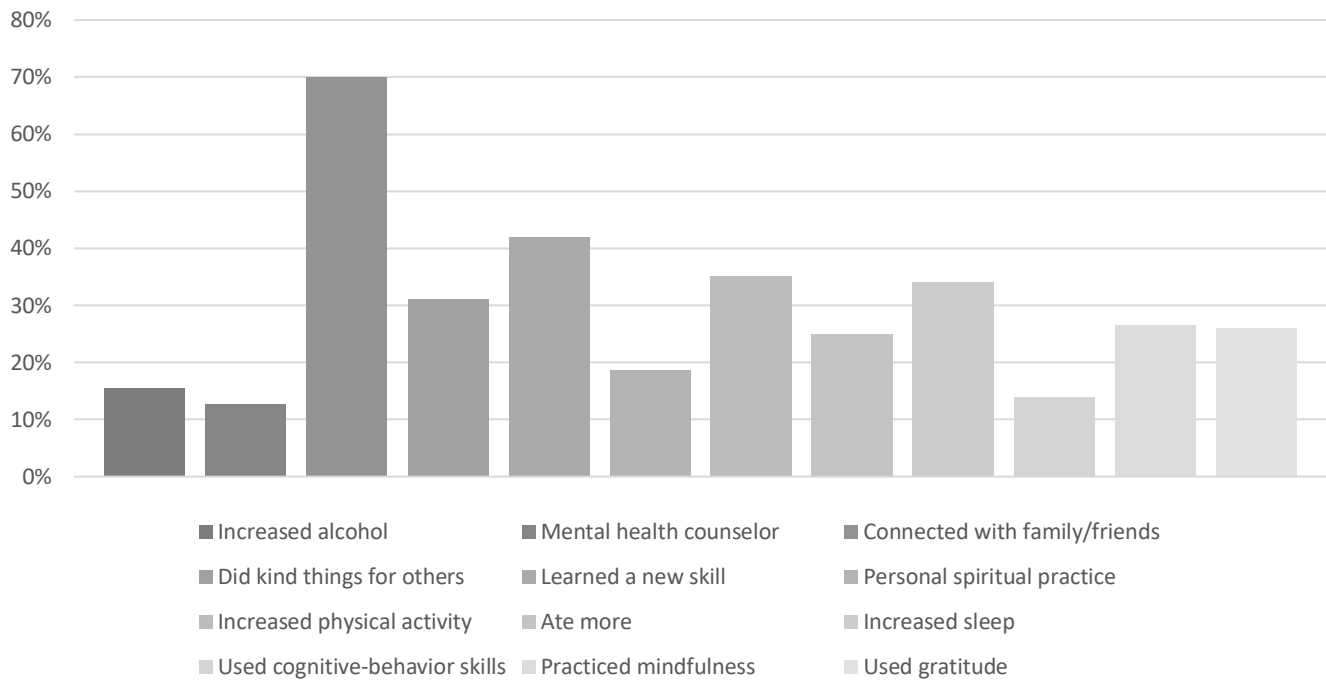
Over 50% of students denoted that they have problems coping with the stress in their life and 29.2% were experiencing at least one symptom of burnout (e.g., physical or emotional exhaustion). In relation to this inability to cope, 33.8% of students expressed being at least somewhat interested in participating in stress management programming (Table 5).

Table 5. Student's Stress and Burnout

	All (n = 4441)		Professional Students (n = 382)		Graduate Students (n = 657)		Central Campus Undergraduate Students (n = 2522)		Regional Campus Undergraduate Students (n = 880)	
	N	%	N	%	N	%	N	%	N	%
<b>How much stress are you currently feeling about returning to campus?</b>										
None	714	16.1	54	14.1	57	8.7	424	16.8	179	20.3
A little	1004	22.6	74	19.4	120	18.3	597	23.7	213	24.2
Somewhat	892	20.1	89	23.3	119	18.1	517	20.5	167	19.0
Moderately so	985	22.2	103	27.0	176	26.8	531	21.1	175	19.9
Very much so	842	19.0	62	16.2	185	28.2	449	17.8	146	16.6
Missing	4	0.1	0	0.0	0	0.0	4	0.2	0	0.0
<b>How much stress are you currently feeling over finances?</b>										
None	799	18.0	53	13.9	106	16.1	500	19.8	140	15.9
A little	827	18.6	69	18.1	138	21.0	478	19.0	142	16.1
Somewhat	797	17.9	72	18.8	134	20.4	431	17.1	160	18.2
Moderately so	884	19.9	86	22.5	115	17.5	502	19.9	181	20.6
Very much so	1132	25.5	102	26.7	164	25.0	609	24.1	257	29.2
Missing	2	0.0	0	0.0	0	0.0	2	0.1	0	0.0
<b>How well are you currently handling the stress in your life?</b>										
I am usually able to cope effectively	2126	47.9	196	51.3	296	45.1	1232	48.9	402	45.7
I sometimes have problems coping	1826	41.1	149	39.0	295	44.9	1033	41.0	349	39.7
I often have problems coping	482	10.9	37	9.7	66	10.0	252	10.0	127	14.4
Missing	7	0.2	0	0.0	0	0.0	5	0.2	2	0.2
<b>Are you interested in participating in programming that can help you to deal more effectively with stress?</b>										
None	1842	41.5	156	40.8	226	34.4	1060	42.0	400	45.5
A little	1089	24.5	93	24.3	166	25.3	637	25.3	193	21.9
Somewhat	814	18.3	82	21.5	137	20.9	441	17.5	154	17.5
Moderately so	440	9.9	33	8.6	77	11.7	244	9.7	86	9.8
Very much so	250	5.6	18	4.7	50	7.6	136	5.4	46	5.2
Missing	6	0.1	0	0.0	1	0.2	4	0.2	1	0.1
<b>Burnout Assessment</b>										
I enjoy my work. I have no symptoms of burnout (+1)	554	12.5	41	10.7	83	12.6	298	11.3	132	15.0
Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out (+2)	2029	47.2	180	47.1	275	41.9	1217	48.3	425	48.3
I am definitely burning out and have 1+ symptoms of burnout, such as physical and emotional exhaustion (+3)	1295	29.2	114	29.8	211	32.1	731	29.0	239	27.2
The symptoms of burnout that I'm experiencing won't go away. I think about frustration at work a lot (+4)	366	8.2	37	9.7	69	10.5	209	8.3	51	5.8
I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help (+5)	109	2.5	8	2.1	18	2.7	55	2.2	28	3.2

**Figure 5** shows the strategies used by at least 10% of students to cope with COVID-19. Connecting with family and friends was the most commonly reported coping strategy (70.1%), followed by learning a new skill (42%) and increased physical activity (35.1%). Only 2% of the students engaged in wellness programs offered to cope with COVID-19. Thirty-four percent of the students indicated that they used increased sleep to cope with COVID-19. Increased use of alcohol to cope with the pandemic was reported by 15.5% of the students and increased use of tobacco and vaping was reported by 5.9% of the students.

**Figure 5.** Strategies Used by 10% or More Students to Cope with COVID-19



*Figure 5.* On the Return to Campus survey, students were asked to select which strategies they were using to cope with the stress of COVID-19. Students were asked to select all options that applied, therefore the percentage totals more than 100%.

### Healthy Lifestyle Behaviors

To assess COVID-19’s impact on healthy lifestyle behaviors, students were asked how their daily physical activity, eating habits, amount of sleep, and coping mechanisms had changed since the start of the pandemic. Fifty-two percent of students indicated that they had participated in less physical activity than usual. Exercising more than usual was the least frequently selected option. Forty-three percent reported that their eating patterns had stayed the same. Thirty-five percent reported that they had been eating less healthy. Like healthy eating, 44.2% of the students reported that there had been no change in their sleep. However, 26.5% expressed that they had been sleeping less and 29.2% reported that they had been sleeping more. The top three motivators for exercising and eating a nutritious diet were “it helps me feel good about myself,” “I want to be in control of my weight,” and “I want to be strong.” A third of

students (32.9%) expressed being at least somewhat interested in wellness programming after returning to campus (Table 6).

**Table 6.** *Students' Healthy Lifestyle Behaviors*

	All (n = 4441)		Professional Students (n = 382)		Graduate Students (n = 657)		Central Campus Undergraduate Students (n = 2522)		Regional Campus Undergraduate Students (n = 880)	
	N	%	N	%	N	%	N	%	N	%
<b>What has been your level of daily physical activity since COVID-19?</b>										
The same	1107	24.9	96	25.1	124	18.9	605	24.0	282	32.0
Less than usual	2332	52.5	186	48.7	392	59.7	1348	53.4	406	46.1
More than usual	993	22.4	98	25.7	138	21.0	565	22.4	192	21.8
Missing	9	0.2	2	0.5	3	0.5	4	0.2	0	0.0
<b>How have your eating patterns changed since COVID-19?</b>										
The same	1915	43.1	171	44.8	279	42.5	1071	42.5	394	44.8
Less healthy	1559	35.1	131	34.3	209	31.8	889	35.2	330	37.5
More healthy	959	21.6	78	20.4	169	25.7	557	22.1	155	17.6
Missing	8	0.2	2	0.5	0	0.0	5	0.2	1	0.1
<b>How has your sleep been impacted by COVID-19?</b>										
No change	1958	44.1	177	46.3	280	42.6	1124	44.6	377	42.8
Less than usual	1178	26.5	97	25.4	194	29.5	623	24.7	264	30.0
More than usual	1298	29.2	106	27.7	183	27.9	772	30.6	237	26.9
Missing	7	0.2	2	0.5	0	0.0	3	0.1	2	0.2
<b>If you exercise regularly and/or maintain a nutritious diet, which of the following motivates you to do so? (Please select all that apply)</b>										
It relieves stress for me	2018	45.4	212	55.5	330	50.2	1158	45.9	318	36.1
It helps me to feel good about myself	2784	62.7	270	70.7	406	61.8	1657	65.7	451	51.3
I want to be in control of my weight	2266	51.0	231	60.5	339	51.6	1304	51.7	392	44.5
I want to do everything possible to maintain/improve my health	2037	45.9	190	49.7	327	49.8	1206	47.8	314	35.7
I want to live a long life	1885	42.4	174	45.5	291	44.3	1105	43.8	315	35.8
I want to be strong	2073	46.7	186	48.7	297	45.2	1258	49.9	332	37.7
It is a good way for me to practice discipline	1239	27.9	103	27.0	179	27.2	772	30.6	185	21.0
Not applicable as I don't exercise regularly	778	17.5	52	13.6	110	16.7	394	15.6	222	25.2
Not applicable as I typically don't maintain a nutritious diet	489	11.0	25	6.5	62	9.4	242	9.6	160	18.2
<b>Are you interested in participating in wellness programming when you return to campus?</b>										
None	1804	40.6	155	40.6	236	35.9	1025	40.6	388	44.1
A little	1171	26.4	100	26.2	167	25.4	681	27.0	223	25.3
Somewhat	775	17.5	72	18.8	147	22.4	409	16.2	147	16.7
Moderately so	444	10.0	37	9.7	68	10.4	261	10.3	78	8.9
Very much so	241	5.4	18	4.7	38	5.8	143	5.7	42	4.8
Missing	6	0.1	0	0.0	1	0.2	3	0.1	2	0.2



## Virtual Programming and Services: Accessibility, Interest, and Utilization

Overall, most students reported being able to access virtual wellness programming, however, 5.8% reported that they could not access the virtual programming. Forty-seven percent of students were satisfied (either agreed or strongly agreed) with the amount of virtual programming provided, and 39.8% were neutral about their satisfaction with the amount of virtual programming. Thirty-six percent of students had used virtual programming prior to COVID-19 (either agreed or strongly agreed). More than 50% of students either “agreed” or “strongly agreed” that they will use virtual programming offered by the University in the future (Table 7).

**Table 7.** *Accessibility, Interest, and Utilization of Virtual Programming and Services*

	All (n = 4441)		Professional Students (n = 382)		Graduate Students (n = 657)		Central Campus Undergraduate Students (n = 2522)		Regional Campus Undergraduate Students (n = 880)	
	N	%	N	%	N	N	%	N	%	N
<b>I am able to access virtual programming and services offered by the University.</b>										
Missing	24	0.5	4	1.0	4	0.6	13	0.5	3	0.3
Strongly disagree	115	2.6	15	3.9	18	2.7	51	2.0	31	3.5
Disagree	143	3.2	10	2.6	23	3.5	84	3.3	26	3.0
Neither disagree or agree	668	15.0	70	18.3	113	17.2	353	14.0	132	15.0
Agree	1836	41.3	151	39.5	233	35.5	1085	43.0	367	41.7
Strongly agree	1655	37.3	132	34.6	266	40.5	936	37.1	321	36.5
<b>I am satisfied with the amount of virtual programming and services offered by the University.</b>										
Missing	42	0.9	6	1.6	6	0.9	23	0.9	7	0.8
Strongly disagree	150	3.4	12	3.1	22	3.3	86	3.4	30	3.4
Disagree	396	8.9	39	10.2	53	8.1	234	9.3	70	8.0
Neither disagree or agree	1769	39.8	162	42.4	271	41.2	1049	41.6	287	32.6
Agree	1477	33.3	131	34.3	203	30.9	820	32.5	323	36.7
Strongly agree	607	13.7	32	8.4	102	15.5	310	12.3	163	18.5
<b>I had used virtual programming or services prior to COVID-19.</b>										
Missing	44	1.0	6	1.6	6	0.9	25	1.0	7	0.8
Strongly disagree	852	19.2	75	19.6	138	21.0	496	19.7	143	16.3
Disagree	1298	29.2	117	30.6	200	30.4	755	29.9	226	25.7
Neither disagree or agree	664	15.0	62	16.2	107	16.3	350	13.9	145	16.5
Agree	1075	24.2	91	23.8	139	21.2	617	24.5	228	25.9
Strongly agree	508	11.4	31	8.1	67	10.2	279	11.1	131	14.9
<b>I will use virtual programming or services offered by the University in the future.</b>										
Missing	43	1.0	6	1.6	6	0.9	27	1.1	4	0.5
Strongly disagree	179	4.0	18	4.7	20	3.0	103	4.1	38	4.3
Disagree	313	7.0	31	8.1	38	5.8	187	7.4	57	6.5
Neither disagree or agree	1366	30.8	108	28.3	192	29.2	781	31.0	285	32.4
Agree	1779	40.1	161	42.1	266	40.5	1037	41.1	315	35.8
Strongly agree	761	17.1	58	15.2	135	20.5	387	15.3	181	20.6

## DISCUSSION

This study's results indicate a critical need to continue to accelerate access to mental health services along with preventive and early evidence-based interventions and mental health and wellness programming. An alarming rate of students met clinical cut-offs for anxiety (39%) and depression (24%), while an equally alarming rate of students indicated that they were experiencing burnout (40%). A pre-COVID cross-sectional study of professional and graduate students which used the same screening tools (PHQ-2 and GAD-2) reported that 17% of students met the clinical cut off for depression and 14% met the clinical cut off for anxiety (Hoying, Melnyk, Hutson, & Tan, 2020). While study populations were not identical (i.e., Hoying et al. [2020] did not include undergraduate students or measure burnout), a rough comparison indicates that there has been a 1.4x increase in depression and 3x increase in anxiety. The depression increase is identical to a recent COVID-19 student mental health analysis, and the increase in anxiety is slightly higher (3x vs 2x; Chirikov et al., 2020).

At least 30% of students were not at all confident about being able to return to campus safely and, when broken down by race/ethnicity, minority student populations had higher levels of no confidence than non-Hispanic White student populations. The same trend was observed for depression and anxiety, with minority students reporting significantly more symptoms than non-Hispanic white students. Minority populations have been impacted by the COVID-19 pandemic significantly more than their white counterparts, with structural factors as key contributors (Van Dorn, Cooney, & Sabin, 2020). In the U.S., minority populations face inequalities in terms of discrimination, access to healthcare, and disproportionately working in essential worker roles which substantially impacts the ability to social distance. Therefore, IHEs must prioritize and consider how they can decrease implicit bias and discrimination in addition to increasing access to healthcare on their campuses for these disproportionately impacted populations.

A WHO (2020) mental health rapid assessment reported that 60% of countries have experienced major disruptions to mental health services for vulnerable people and that the greatest impact has been on preventative services. Thus, IHEs can serve as a means for empowering students and limiting disruptions to preventative mental health care. In an effort to continue to shift the paradigm from crisis intervention to prevention and early intervention, the University has further expanded its evidence-based mental health and wellness programming with funding from the CARES Act (Coronavirus Aid, Relief, and Economic Security Act, 2019-2020). The MINDSTRONG cognitive-behavioral skills building program (also known as Creating Opportunities for Personal Empowerment [COPE] in the literature) is effective in decreasing depression, anxiety, stress, and suicidal ideation and increasing healthy lifestyle behaviors by improving mental resiliency and coping (Hart Abney, Lusk, Hovermale, & Melnyk, 2019; Melnyk et al., 2015; Melnyk, Hoying, & Tan, 2020). MINDSTRONG is now required in certain colleges and is offered as a one credit course program. Equipping college students with evidence-based skills, such as mindfulness and cognitive-behavioral/coping skills, can build resiliency and protective factors to help prevent mental health disorders (Galante et al., 2018; Regehr, Glancy, & Pitts, 2013). Universities should consider integrating preventive evidence-based programming into required course work. If not required, innovative strategies to engage students in this type of programming is necessary. Additionally, the University's College of Nursing created a telehealth wellness hub in which faculty and advanced practice nurse practitioner students conduct total health and well-being assessments along with health coaching to students across campus.

This study's findings demonstrated that unhealthy lifestyle behaviors were on the rise in a substantial proportion of students who were using them to cope with the current pandemic. Increases in unhealthy lifestyle behaviors in

younger populations also have been reported in several other studies (Chirikov et al., 2020; Gallè et al., 2020; Park et al., 2020; Zheng et al., 2020). As the risk of developing a chronic condition can be lessened by engaging in healthy lifestyle behaviors (CDC, 2020), universities must create cultures of wellness in which healthy behaviors are the default choice or norm for students, faculty, and staff. If the trends in unhealthy behaviors are not reversed, the prevalence of chronic diseases will continue to impact future generations.

Improving student mental health, well-being, and healthy lifestyle behaviors requires that comprehensive wellness cultures be built and sustained at universities throughout the country. Leadership and manager engagement are vital for creating and sustaining strong wellness cultures, as are grassroots initiatives like wellness champions (Amaya et al., 2020; Melnyk, Amaya, Szalacha, & Hoying, 2016). In a 2019 case study published by the National Academy of Medicine's Action Collaborative on Clinician Well-being and Resilience (Cappelucci, Zindel, Knight, Busis, & Alexander, 2019), medical students reflected this belief with statements like "Our Deans and leadership are so important for student well-being. Their transparency, honesty, and support trickles down to students, and we feel that we have a strong support system when times are hard." Presidents, deans, and faculty will continue to play a critical role in encouraging, engaging, and supporting their students to participate in wellness programming and activities. A new tool entitled "Check and Improve Your Stress and Well-being" has been launched and piloted with the University's students. This tool provides students with the opportunity to check and monitor their own levels of stress, anxiety, depression, and healthy lifestyle behaviors along with providing them with a variety of evidence-based resources and support.

Slightly less than 50% of students believed that they knew how to best prevent the spread of COVID-19 and only 40% of students at least somewhat believed that their peers would follow appropriate safety protocols when returning to campus. A sense of safety or lack thereof impacts school culture (Aldrige & McChesney, 2018), thus, continued educational programming and communications on the topic of preventing COVID-19 will be important, as increased COVID-19 knowledge is significantly associated with less negative beliefs about COVID-19 preventative practices (Zhong et al., 2020). To engage students in solutions to these issues, a student innovation challenge was launched at the University to encourage students to become more involved in generating innovative ideas to improve compliance with mask wearing and physical distancing in on-campus and off-campus residences as well as improving the mental health and well-being of students.

A strength of this study is that it used a random sample so that findings could be generalized to the rest of the University's population. Furthermore, the demographic findings were similar to those posted by the University. A limitation was the cross sectional design and 30% response rate, which is lower than the recommended 40% (Story & Tai, 2019). In addition, the participants in this study were all from one IHE, therefore, generalizability to other IHE students across the U.S. is limited. However, the rates of anxiety and depression are similar to the Student Experience in the Research University (SERU) Consortium survey (Chirikov et al., 2020) and the Morbidity and Mortality Weekly Report (Czeisler et al., 2020).

## CONCLUSION

The high percentages of clinical anxiety and depression in the student population are alarming, therefore continuing to understand the impact that COVID-19 has had on the mental health of the student population and which evidence-based interventions are most effective remains a top priority, especially for ethnic and racial

diversity populations. The University's Chief Wellness Officer, One University Health and Wellness Council, and Office of Student Life leadership will continue to monitor outcomes and plan targeted evidence-based strategies to enhance student health and well-being. Even after the COVID-19 pandemic has passed, diverting resources to build and sustain cultures of wellness within IHE will continue to be important to improving population health and well-being for the next generation.

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