COVID-19 Appraisals and Stress Among College Students With and Without Disabilities

Lauren Conder[1]
Sarah Vanacore[1]
Alia Simon[1]
Christyn Dolbier[1]

Abstract

Many individuals have experienced increased stress and distress during the COVID-19 pandemic. College students with disabilities may have experienced the pandemic as more threatening and stressful due to exposure to risk factors for contracting COVID-19 and stressors related to college and health and safety. This study examined differences in general stress, cognitive appraisals of the pandemic (e.g., viewing the pandemic as threatening or uncontrollable), and pandemic-specific stress between southeastern college students with and without disabilities. Analyses of covariance revealed group differences in general stress, threat appraisal of the pandemic, and pandemic-specific stress related to academics, larger societal concerns (e.g., economy, death toll), concern for loved ones' well-being, financial issues, health and safety concerns, mental health concerns, uncertainty about the future, concern regarding access to medical resources, and technology concerns. Participants with disabilities viewed the pandemic as more threatening and stressful than those without a disability. Participants with comorbid mental health, learning, and/or physical disabilities reported greater threat and stress compared to other groups, with those with a mental health disability only also showing this pattern. As policies related to course formats and COVID-19 safety precautions change, further examination of pandemic appraisals and stress should continue in order to provide recommendations to student support professionals.

Keywords: stress, appraisal, COVID-19 pandemic, disability

The COVID-19 pandemic has been conceptualized as a multidimensional, dynamic stressor that has impacted both systems and individuals (Gruber et al., 2021). In the United States, individuals experienced heightened stress from a set of pandemic-specific stressors, including uncertainty about the pandemic's end, political polarization, exacerbation of inequities and disparities, and concern about the economy (Park et al., 2021). Individual stressors included concern about acquiring a severe illness with potential health complications, job insecurity, delayed educational milestones, worry about loved ones' safety and well-being, change to daily routines, and strained financial resources (Gruber et al., 2021; Park et al., 2021). Overall, the U.S. population experienced greater distress and stress due to the pandemic, which may have been augmented for people with disabilities due to structural barriers and accommodation barriers in work or school settings (Parsloe & Smith, 2022).

Prior to the pandemic, 25% of the U.S. adult population met criteria for having a disability, and approximately 19% of college students could be classified as having a disability (National Center for Education Statistics [NCES], 2019; Okoro et al., 2016). According to the Americans with Disabilities Act (ADA; 1990) and the ADA Amendments Act (ADAA; 2008), individuals are considered to have a disability if they have "a physical or mental impairment that substantially limits one or more major life activities," or are "a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment" (Section 12102). Accord-

[1] *East Carolina University*

ing to this definition, disability can include chronic health conditions (e.g., HIV, multiple sclerosis), mental health conditions (e.g., generalized anxiety disorder, major depressive disorder), physical disabilities such as spinal cord injuries, sensory disorders (e.g., deafness, blindness), and learning disabilities such as specific learning disorders.

College Student Stress

Since the onset of the COVID-19 pandemic, college students reported increased stress (Wang et al., 2020), as well as pandemic-specific stressors, including concern about their own health, loved ones' health, and societal implications (Cohen et al., 2020; Son et al., 2020; Wang et al, 2020), and increased rates of housing and food insecurity (Goldrick-Rab et al., 2021). Moreover, students reported unique academic stressors, such as switching to online coursework and decreased access to technology and professional opportunities, such as internships (Cohen et al., 2020; Kecojevic et al., 2020; Lederer et al., 2021).

Pre-COVID, students with disabilities faced barriers due to ableism within higher education (Parsloe & Smith, 2022) and a range of unique stressors. Unique stressors have included structural practices related to attendance policies, physically inaccessible classrooms, timed exams, financial and other barriers related to accessing disability services and accommodations, fatigue from concealing a disability, and potential stigma (Carroll et al., 2020). Less than 20% of students who used accommodations for a disability in high school received accommodations in college, suggesting a variety of barriers to registering with campus disability services (Newman et al., 2011).

Before the pandemic, virtual attendance was frequently deemed an "unreasonable accommodation" or, if given, it was often a specific accommodation that signaled the presence of a disability to others (Parsloe & Smith, 2022). During the beginning of the pandemic, changes in remote learning were beneficial for some students with disabilities. Virtual learning allowed for decreased physical barriers, participation via written text (e.g., chat feature), decreased physical effort spent commuting, and potential increased access to bathrooms, food, and medical supplies in one's home (Parsloe & Smith, 2022). However, virtual learning presented additional barriers to other college students with disabilities, including those with sensory or learning disabilities, as virtual platforms are not always accessible (e.g., closed captioning, compatibility with screen readers). Thus, examining disability categories could provide context to an investigation of stressors for disabled students.

As the pandemic continued, policy changes such as the removal of hybrid/virtual options and mask mandates created additional barriers for students with physical disabilities and increased the risk of contracting COVID-19 (Parsloe & Smith, 2022). Since risk factors for contracting COVID-19 include mental health conditions, impaired immune systems, and living in housing conditions with many people (e.g., dormitories, group homes), students with mental health and physical disabilities may be at greater risk for contracting COVID-19 and subsequent harm (Gleason et al., 2021; Pfefferbaum & North, 2020). Because of this, students with disabilities may view COVID-19 as more threatening with the potential to inflict more harm.

College Student Mental Health

During previous natural disasters and pandemics, there has been an increase in rates of mental health conditions, especially for those at higher risk, such as adults with physical or pre-existing mental health conditions (Pfefferbaum & North, 2020). Before the pandemic, students with disabilities indicated greater distress and concern with academic performance, and proportionally had higher rates of mental health conditions than those without disabilities (Aguilar & Lipson, 2021; Coduti et al., 2016; Fleming et al., 2018). When further examined by type of disability (i.e., sensory, learning, physical, psychological), students with psychological disabilities indicated significantly greater anxiety and other indicators of mental distress compared to students with other types of disabilities (Coduti et al., 2016). However, this study did not specifically examine those with comorbid mental, learning, and/or physical disabilities (Coduti et al., 2016).

Similar to the pandemic's impact on classes, virtual access to mental health services can include accessibility barriers, such as lack of internet access, lack of captioning, incompatibility with screen readers, or initial inability to add interpreters to medical and mental health video platforms (Verduzco-Gutierrez et al., 2021). Students with disabilities were also more likely to access mental health services, especially free or low-cost services through university counseling centers (Aguilar & Lipson, 2021). Disability support providers reported that students with disabilities endorsed more structural barriers toward accessing mental health services earlier in the pandemic (Aquino & Scott, 2022). While access has improved over time, it is important to assess mental health in this population during the pandemic. As previous research examining disabled students' mental health has primarily focused on students registered with disability support services or seeking treatment

at the university counseling center (Aguilar & Lipson, 2021; Coduti et al., 2016; Fleming et al., 2018), it is important to assess mental health in a broader sample of students.

Appraisals of the Pandemic

The overall increase in stress during the pandemic may be influenced by individuals' cognitive evaluation and interpretation of the pandemic (i.e., their appraisals). Lazarus and Folkman's (1984) transactional model of stress and coping proposes that stress is an interaction between the person and environment, whereby an individual appraises a particular situation. Primary appraisal occurs as an individual appraises whether a situation is relevant to their well-being, as a potential threat (i.e., potential for harm/loss) or challenge (i.e., potential for gain/mastery). Secondary appraisal involves an individual's appraisal of their coping resources and perceived control over the situation (Folkman et al., 1986). Stress arises when the demands of a threatening situation outweigh one's coping resources.

Limited research has been conducted on cognitive appraisals of the pandemic. Using the transactional model, Li and colleagues (2020) found that Chinese citizens appraised the pandemic as highly severe and moderately controllable. Other kinds of appraisals of the pandemic have also been examined. Starick and colleagues (2021) investigated relationships between appraisals of COVID-19 disruptions and coping and eating behaviors in Canadian undergraduate women. Additionally, Rosebruck and colleagues (2021) developed the Oxford Psychological Investigation of Coronavirus Questionnaire that assessed appraisals about safety, impact, contracting and spreading COVID-19, the self, and being targeted. However, we know of no studies assessing appraisals of the pandemic among U.S. college students, much less those with disabilities. After the pandemic onset, there have not been any studies that have examined pandemic appraisals and domains of stress among college students with different types of disabilities and college students without disabilities.

The Current Study

The COVID-19 pandemic presented unprecedented challenges that have worsened psychological stress. While there has been an influx of studies on the psychological stress imposed by the pandemic, less is known about the differential impact of COVID-19 on college students with and without disabilities. The potential threat of harm due to the pandemic may be greater for students with disabilities given several high-risk factors for contracting the virus, including characteristics more often present in individuals with disabilities. Some pandemic-related changes in colleges (e.g., virtual learning) decreased barriers for some students with disabilities, while simultaneously increasing barriers for other students with disabilities (Parsloe & Smith, 2022). Because of this, examining categories of disability can be helpful for providing additional context surrounding stressors and appraisals during the COVID-19 pandemic. The current study examined differences in general stress, cognitive appraisals of the pandemic, and pandemic-specific stress between (a) students without mental health, learning, or physical disabilities, (b) those with a mental health disability only, (c) those with a physical disability only, (d) those with a learning disability only, and (e) those with comorbid mental health, learning, and/or physical disabilities.

Method

Procedures

In this cross-sectional study, a two-part online survey was administered at a large, Southeastern public university during the fall 2020 and spring 2021 semesters, after approval by the university's institutional review board. During fall 2020, students were on campus for two weeks before residence halls were closed and all courses were made virtual, while spring 2021 saw residence halls re-open and a mix of in-person and virtual courses. Undergraduates were recruited using a combination of convenience and random sampling methods. Convenience sampling consisted of recruiting from Introductory Psychology courses via an online research participation management system and emails to university advisors, faculty, and contacts for student associations to request distribution of the study flyer. A random sample of 8,000 students who met eligibility criteria, provided by the university survey review and oversight committee, were emailed an invitation to participate in the study.

Eligibility criteria included being 18-26 years of age and current enrollment as an undergraduate. Recruitment materials included a web address for participation. After providing consent electronically, participants were instructed to begin part 1 of the online survey. After completing part 1, participants were provided the link to part 2 and asked to complete it within one week. The two parts were an effort to reduce participant burden related to one lengthy survey. Participants who completed both survey parts and passed a validation check (i.e., correctly answering four out of five questions embedded throughout each part) were included in data analyses and provided with either credit for their Introductory Psychology

course (to count toward a requirement for participation or consuming research) or entrance into a raffle to win one of five $50 gift cards each semester.

Participants

Of the total sample (N = 716), the majority identified as women, White, freshmen, heterosexual, and continuing generation college students without a mental, physical, or learning disability (see Table 1). The mean age was 19.28 years (SD = 1.48). This sample is over-representative of women (70% versus 58%), people of color (34% versus 29%), freshmen (57% versus 23%) and first-generation college students (33% versus 14%), compared to the university's undergraduate population (East Carolina University, 2022).

Measures

Disability

Disability was defined using the ADA (1990) and ADAA (2008) classification, which can include physical and mental health conditions that are disabilities. For the purpose of this study, disability status was categorized as follows: (a) self-reporting not having a mental, learning, or physical disability (NoMLPD); (b) self-reporting having a physical disability (only) (PDO); (c) self-reporting having a mental health disability (only) (MDO); (d) self-reporting having a learning disability (only) (LDO); and (e) self-reporting having more than one physical, learning, and/or mental disabilities (CoMLPDs). Learning disability was determined by a "yes" response to the yes/no question "Do you have a learning disability?" Physical disability was determined by a "yes" response to the yes/no question "Do you have a physical health condition or disability?" In order to correct for participants who may have self-diagnosed or overestimated the likelihood of having a mental health disability, mental health disability was determined by a "yes" response to the yes/no question "Do you have a mental health condition or disorder?" along with a positive screen (above the clinical cut-off) for major depression, generalized anxiety disorder (GAD), social phobia, panic disorder, and/or specific phobia on the psychometrically sound screening measures described below.

The Patient Health Questionnaire-8 screens for major depression using a clinical cutoff score of 10 (Kroenke et al., 2009). The Generalized Anxiety Disorder-7 scale screens for GAD using a clinical cutoff score of 10 (Spitzer et al., 2006). The Social Phobia Screener screens for social anxiety disorder using a clinical cutoff score of 8 (Batterham et al., 2017). The Panic Disorder Screener screens for panic disorder using a clinical cutoff score of 4 (Batterham et al., 2015). The Specific Phobia Questionnaire (SPQ) screens for specific phobias of Animals (clinical cutoff of 8), Natural environments (15), Situations (4), Blood-injection-injury (20), or Other (6) (Ovanessian et al., 2019). The study alphas for these ranged from .77-.90, with the exception of the SPQ Other subscale (.51).

Cognitive Appraisal

A modified version of the Folkman Stress Questionnaire (Folkman et al., 1986) assessed appraisals of the pandemic. Four items assessed primary appraisal, specifically the "possibility of loss or harm" and "having difficulty getting along in the world" due to the pandemic as they pertain to the participant and loved ones. For secondary appraisal, participants indicated the degree to which the pandemic was one "in which you needed to know more before you could act," "that you have to accept," and "in which you have had to hold yourself back from doing what you wanted to do." Participants responded on a scale from 1 (Not at all) to 5 (Very much so). Total scores for primary and secondary appraisal were calculated by averaging items, with higher scores indicating greater appraisals of threat or the potential for harm or loss (primary appraisal) and not being able to prevent harm or overcome demands of the pandemic (secondary appraisal). For the current study, Cronbach's alphas were .81 for primary and .57 for secondary appraisal.

General Stress

The 10-item Perceived Stress Scale-10 (PSS-10) measures the extent to which an individual interprets life circumstances as stressful (Cohen & Williamson, 1988). The items inquire about the frequency of uncontrollable, unpredictable, and overloaded feelings and thoughts during the last month using a scale from 0 (Never) to 4 (Very often). Items remain broad to ensure generalizability and applicability to the general population. Following a reverse-scoring of four items, all items are summed. Possible scores range from 0 to 40, with higher scores indicative of greater levels of general stress. The PSS-10 has demonstrated internal consistency and construct validity among college students (Roberti et al., 2006). For the current study, the Cronbach's alpha for the PSS-10 was .86.

Pandemic-Specific Stress

Our research team created a 70-item measure to assess pandemic-specific stress within domains relevant to college students (e.g., academics, health, relationships). Participants were asked to indicate if they experienced "the following challenges or difficulties associated with the coronavirus pandemic" and if so, to rate the degree to which the stressor produced

Table 1

Descriptive Statistics for Categorical Demographic Variables

Characteristic	*n*	%
Gender		
Non-binary or gender fluid	2	0.28
Man	204	28.49
Transgender man or woman	4	0.56
Woman	502	70.11
Race and ethnicity		
Asian or Asian American	28	3.91
Black or African American	104	14.45
Native Hawaiian or other Pacific Islander	3	0.42
Latinx or Hispanic	67	9.36
Native American or Alaska Native	1	0.14
Multiracial/ethnic	41	5.73
White or European American	470	65.64
Student year		
Freshman	410	57.26
Sophomore	112	15.64
Junior	95	13.27
Senior	99	13.83
Sexual orientation		
Asexual	3	0.42
Bisexual	51	7.12
Gay	3	0.42
Heterosexual or straight	617	86.17
Lesbian	7	0.98
Pansexual	9	1.26
Queer	3	0.42
Questioning or unsure	15	2.09
Another sexual orientation	7	0.98
First-generation college student	238	33.24
Disability category		
No mental, physical, learning disability (NoMLPD)	495	69.13
Only mental health disability (MDO)	124	17.32
Only physical disability (PDO)	21	2.93
Only learning disability (LDO)	25	3.49
More than one physical, learning, mental disability (CoMLPDs)	51	7.12

stress using a scale from 1 (No stress) to 5 (An extreme amount of stress). Scores were calculated by averaging stressfulness ratings for the total scale and subscales identified through factor analysis.

An exploratory factor analysis (EFA) was conducted with the 70 items. To enable the EFA, 0s were imputed for stressfulness ratings missing if participants indicated they had not experienced the given stressor. For the EFA, a principal axis analysis with promax rotation was conducted. Items with communalities less than .30, loadings less than .40, or that cross-loaded were sequentially deleted, resulting in 45 items loading on nine factors. Factor loadings of items are shown in the appendix. Based on items loading on each factor, the following interpretive labels for concerns related to the COVID-19 pandemic are suggested: social concerns (8 items), academic concerns (8 items), work concerns (6 items), larger societal concerns (5 items), concern for loved ones' well-being (4 items), COVID safety adherence concerns (4 items), living arrangement concerns (4 items), technology concerns (3 items), and financial concerns (3 items). The nine factors accounted for 69.0% of the total variance explained. The suitability of the data for structure detection was indicated by the Kaiser–Meyer Olkin measure of sampling adequacy (.94), and a significant Bartlett test of sphericity.

The 25 deleted items related to concerns in the nine areas identified by the EFA, with the exception of personal health/safety, personal access to medical resources, uncertainty about the future, and family responsibilities/strain. As concern for health and safety, access to medical resources, and uncertainty about the future may be particularly relevant to individuals with disabilities, we examined four items related to these areas in our analyses in addition to the nine factors described previously. These items include: "Concern for your health or safety related to the coronavirus;" "Concern about your mental well-being due to the pandemic;" "Concern about you not being able to get needed medical care or health related items (e.g., prescriptions) due to the pandemic;" and "Uncertainty about the future due to the pandemic."

The pandemic stress total (a = .94) and factor subscales (a ranges from .77 to .91) demonstrated adequate internal consistency. The pandemic stress total significantly correlated with the PSS-10 (r = .46, p < .001), as did the subscales, and four items listed previously (rs = .19 - .55, ps < .001), supporting the validity of this measure.

Data Analysis

Descriptive statistics were calculated for each variable. Pearson correlations were calculated among study variables. Given demographic characteristics (e.g., gender, race/ethnicity) and external factors such as the availability of the first COVID-19 vaccine could relate to our study variables, we examined relationships between demographic variables and survey completion date with disability category and outcome variables. Differences in demographic variables and survey completion date by disability category (NoMLPD, PDO, MDO, LDO, CoMLPDs) were examined using analysis of variance (ANOVA) and chi-square tests. Relationships of demographic variables and survey completion date with outcome variables were examined using Pearson correlations and t-tests. A series of analysis of covariance (ANCOVA; controlling for demographic and survey completion date variables shown to significantly relate to outcomes or differ by disability category) was conducted to examine differences in pandemic cognitive appraisals, general stress, and pandemic-specific stress by disability category. A Bonferroni-corrected p-value of .003 (based on 16 ANCOVAs) was used to determine overall significance of the ANCOVAs and a Bonferroni adjustment was made for post hoc pairwise comparisons. For analyses involving the pandemic stress work factor, only students who indicated employment were included (n=344).

Results

Descriptive Statistics

Descriptive statistics for the study variables can be found in Table 2. On average, participants reported experiencing a moderate level of general stress (M = 19.87, 0-40 possible range). The mean for pandemic primary appraisal (M = 2.90, 1-5 possible range) indicates that participants viewed the COVID-19 pandemic as moderately threatening, with potential for harm or loss. The mean for pandemic secondary appraisal was higher (M = 3.57, 1-5 possible range), indicating they felt moderate-to-extreme uncontrollability and inability to cope. Participants on average indicated a moderate amount of stress related to social, academic, larger societal, mental health, and future uncertainty concerns (M ranges from 2.60 to 2.87, 0-5 possible range). On average, they reported a mild amount of stress related to adherence to COVID-19 precautions and health/safety concerns (M ranges from 1.94 to 2.26, 0-5 possible range) and minimal stress related to concerns about technology, work, finances, loved ones' well-being, their living situation, and access to medical resources (M ranges from 0.95 to 1.29, 0-5 possible range).

Table 2

Descriptive Statistics for Study Variables

Variable	No mental, physical, learning disability (*n* = 491)	Learning disability (*n* = 25)	Physical health disability (*n* = 21)	Mental health disability (*n* = 123)	Comorbid disability (*n* = 50)	Total (*N* = 710)
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
General stress	18.39 (5.69)	20.52 (6.26)	19.90 (6.28)	23.71 (5.20)	24.70 (4.96)	19.87 (6.07)
Appraisal						
Primary	2.76 (1.01)	2.82(1.20)	3.01 (1.06)	3.18 (0.99)	3.47 (0.90)	2.90 (1.03)
Secondary	3.49 (0.92)	3.61 (0.81)	3.75 (0.86)	3.75 (0.72)	3.83 (0.79)	3.57 (0.88)
Pandemic-related stress factors						
Social	2.70 (1.12)	2.88 (1.10)	2.71 (1.18)	2.93 (1.03)	3.25 (1.21)	2.79 (1.12)
Work	1.12 (0.91)	1.24 (1.19)	1.31 (0.65)	1.30 (1.13)	1.55 (1.26)	1.18 (0.97)
Academics	2.72 (1.13)	2.88 (1.20)	2.75 (1.28)	3.20 (1.08)	3.64 (1.19)	2.87 (1.16)
Large-scale concerns	2.47 (1.21)	2.42 (1.01)	2.50 (1.07)	2.89 (1.09)	3.28 (1.14)	2.60 (1.20)
Concern for loved ones' well-being	1.19 (1.03)	1.69 (1.12)	1.17 (1.10)	1.26 (1.27)	1.83 (1.42)	1.26 (1.12)
Financial	1.15 (1.15)	1.24 (1.23)	1.10 (0.97)	1.52 (1.34)	2.26 (1.77)	1.29 (1.26)
Technology	1.04 (0.98)	1.35 (1.08)	1.05 (1.13)	0.92 (1.04)	1.72 (1.30)	1.08(1.04)
Living situation	0.95 (0.96)	0.98 (1.06)	0.82 (0.77)	1.05 (1.04)	1.45 (1.28)	1.00 (1.00)
Adherence to COVID precautions	1.87 (0.99)	2.03 (0.76)	1.83 (1.27)	2.06 (0.90)	2.28 (1.04)	1.94 (0.99)
Pandemic-related stress items						
Health/safety	2.09 (1.30)	2.20 (1.26)	2.43 (1.12)	2.63 (1.39)	2.96 (1.29)	2.26 (1.33)
Mental health	2.32 (1.42)	2.64 (1.32)	2.48 (1.63)	3.53 (1.33)	3.48 (1.30)	2.63 (1.49)
Access to health care	0.87 (0.99)	1.04 (1.24)	0.95 (1.32)	0.95 (1.25)	1.78 (1.58)	0.95 (1.13)
Uncertainty about future	2.74 (1.46)	3.08 (1.38)	2.71 (1.23)	3.28 (1.47)	3.80 (1.20)	2.92 (1.47)

Correlations

Pearson correlations among the study variables were all statistically significant (see Table 3). Correlation coefficients were interpreted as follows: .50 or above as "large," .30 as "medium," and .10 as "small" (Cohen, 1988). Greater perceptions of pandemic threat (primary appraisal) and uncontrollability/inability to cope (secondary appraisal) were related to greater general and pandemic stress in all areas. The relationships were small-to-medium in strength (*rs* ranging from .13 to .47), with the exception of secondary appraisal correlations with living situation concerns and access to health care concerns, which were negligible (*rs* < .10). Greater pandemic stress in all areas was related to greater general stress. These relationships were small-to-medium in strength (*rs* ranging from .19 to .49), with the exception of the mental health concerns' correlation with general stress, which was strong ($r = .55$).

Relationships of Demographics and Survey Completion Date with Disability Category and Outcomes

There were significant differences in gender (dichotomized as those who identified as women and those who did not) by disability category ($p < .001$), with greater percentages of women in MDO, COMPLD, and NoMLPD categories compared to men. There were significant differences in race (dichotomized as those who identified as White and those who identified as a person of color) by disability category ($p = .009$), with greater percentages of White participants in the MDO, CoMLPDs, and NoMLPD categories compared to people of color. Age, parent education, and survey completion date did not significantly differ by disability category.

Age had significant small positive correlations with primary appraisal and stress areas of larger societal, loved ones' well-being, safety adherence, technology, financial, work, access to resources, and health/safety concerns, and a small negative correlation with pandemic-related social concerns (*ps* < .05).

Table 3

Pearson Correlations Among General Stress, Pandemic Appraisal, and Pandemic Stress Variables

	General stress	Pandemic primary appraisal	Pandemic secondary appraisal
Pandemic primary appraisal	.39		
Pandemic secondary appraisal	.23	.40	
Pandemic stress factor: Social concerns	.36	.36	.32
Pandemic stress factor: Work concerns	.20	.28	.14*
Pandemic stress factor: Academic concerns	.49	.38	.31
Pandemic stress factor: Large-scale concerns	.37	.47	.31
Pandemic stress factor: Concern for loved ones' well-being	.20	.29	.13
Pandemic stress factor: Financial concerns	.30	.33	.13
Pandemic stress factor: Technology concerns	.25	.30	.14
Pandemic stress factor: Living situation concerns	.25	.22	.08*
Pandemic stress factor: Adherence to COVID precautions concerns	.49	.38	.31
Pandemic stress item: Health/safety concerns	.34	.40	.28
Pandemic stress item: Mental health concerns	.55	.39	.30
Pandemic stress item: Access to health care concerns	.19	.28	.09*
Pandemic stress item: Uncertainty about future	.41	.42	.32

Note. All significant at $p < .001$ except for *$p < .05$

Parent education had significant small negative correlations with stress areas of loved ones' well-being, technology, financial, and access to resources concerns (*ps* < .05). Survey completion date had significant small negative correlations with stress areas of social, academic, larger societal, loved ones' well-being, safety adherence, technology, mental health, access to resources, future uncertainty, and health/safety concerns. Results of *t*-tests revealed that compared to male participants, female participants reported significantly greater general stress, primary and secondary appraisal, and stress in the areas of social, academic, larger societal, safety adherence, mental health, future uncertainty, and health/safety concerns (*ps* < .05). In addition, participants of color reported significantly greater stress in the areas of loved ones' well-being and health/safety concerns compared to White participants (*ps* < .05)

Differences in Appraisal and Stress by Disability Category

Table 4 shows the results of the ANCOVAs examining differences in pandemic appraisals, general stress, and pandemic-specific stress by disability status. Gender, race, age, parent education, and survey completion date were included as covariates given their relationships with disability category and/or outcome variables. Pairwise comparisons for all ANCOVAs can be found in Table 4. For primary appraisal, the overall model was significant with a small-moderate effect size for disability category. Participants with MDO, LDO, and CoMPLD reported viewing the pandemic as significantly more threatening than those with NoMLPD. In addition, those with CoMLPDs reported viewing the pandemic as significantly more threatening than those with LDO. For secondary appraisal, the overall model did not reach the Bonferroni-corrected level of significance and had a small effect size for disability category. For general stress, the overall model was significant with a large effect size for disability category. Participants with MDO, LDO, and CoMLPDs reported significantly greater general stress than those with NoMLPD. In addition, those with MDO and CoMLPDs reported significantly greater general stress than those with a LDO and those with PDO.

For pandemic-specific stress factors and items, the overall ANCOVA models for academic, larger societal, loved ones' well-being, financial, technology, health and safety, mental health, access to health care, and uncertainty about the future concerns were significant (see Table 4). All had small-moderate effect sizes for disability category, except for mental health concerns, which had a moderate-large effect size. Pairwise comparisons indicated that those with CoMLPDs reported significantly greater stress in all nine of these pandemic stress areas than those with NoMLPD; in eight of these areas compared to those with PDO; in seven of these areas compared to those with MDO; and in six of these areas compared to those with LDO. Those with MDO reported significantly greater stress in six of these pandemic stress areas than those with NoMLPD; two of these areas compared to those with LDO; and one area compared to those with PDO. Those with LDO reported significantly greater stress in one area compared to those with NoMLPD and those with MDO. There were no significant differences in these pandemic stress areas between those with PDO and those with NoMLPD. The overall models for social, work, living situation, and COVID-19 precaution adherence concerns were not significant and had small or small-moderate effect sizes for disability category.

Discussion

The COVID-19 pandemic is a novel, evolving stressor that has impacted multiple life dimensions (Gruber et al., 2021). Research indicates college students with disabilities may be at an increased risk for contracting COVID-19, as well as experiencing increased symptom severity and adverse psychosocial consequences (Anderson et al., 2021; Pfefferbaum & North, 2020). Thus, students with disabilities may be more likely to appraise the pandemic as a threat that taxes their coping resources, resulting in greater stress. Little research has examined such appraisals of the pandemic. Studies have found that college students with disabilities experienced more stress before the pandemic. Thus far, there have not been any studies examining differences in pandemic appraisals and pandemic-related stress among college students with and without disabilities or comparing those with different types of disabilities. To address this gap, the current study examined differences in pandemic appraisals, general stress, and pandemic-specific stress between college students with NoMLPD, PDO, MDO, LDO, and CoMLPDs.

One of the main trends in our study results is that participants with MDO, LDO, and CoMLPDs reported viewing the pandemic as significantly more threatening, with the potential for harm or loss, than those with NoMLPD. This makes sense as college students with disabilities are more likely to have some of the risk factors for contracting COVID-19 (e.g., living in housing conditions with many people, mental health conditions) and recent policy changes (e.g., removal of hybrid/virtual course options and mask mandates)

Table 4

ANCOVAs for General Stress, Pandemic Appraisals, and Pandemic-Specific Stress

Variable	No mental, physical, learning disability (*n* = 495)	Learning disability (*n* = 25)	Physical health disability (*n* = 21)	Mental health disability (*n* = 124)	Comorbid disability (*n* = 51)	*F*	*df*	*p*	η^2
	M (SE)	*M (SE)*	*M (SE)*	*M (SE)*	*M (SE)*				
General stress	18.47(.25)[a,b,c]	20.93 (1.10)[d,e]	20.14 (1.20)[f,g]	23.31(.51)	24.60(.78)	27.69	4,700	**<.001**	.14
Appraisal									
Primary	2.77 (.05)[b,c]	2.85 (.20)[e]	3.03 (.22)	3.16 (.09)	3.47 (.14)	7.84	4,700	**<.001**	.04
Secondary	3.51 (.04)	3.63 (.17)	3.80 (.19)	3.68 (.08)	3.79 (.12)	2.36	4,700	.052	.01
Pandemic-related stress factors									
Social	2.72 (.50)	2.88 (.22)	2.81 (.24)	2.87 (.10)	3.19 (.16)	2.29	4,700	.059	.01
Work	1.11 (.06)	1.24 (.32)	1.35 (.28)	1.31 (.14)	1.57 (.22)	1.39	4,331	.239	.02
Academics	2.74(.05)[b,c]	2.90 (.23)[e]	2.84 (.25)[g]	3.12 (.10)[h]	3.59 (.16)	8.02	4,700	**<.001**	.04
Large-scale concerns	2.49 (.05)[b,c]	2.47 (.23)[e]	2.57 (.25)[g]	2.84 (.11)[h]	3.26 (.16)	6.40	4,700	**< .001**	.04
Concern for loved ones' well-being	1.18 (.05)[a,c]	1.78 (.22)[d]	1.17 (.24)[g]	1.24 (.10)[h]	1.85 (.16)	5.63	4,700	**< .001**	.03
Financial	1.16 (.05)[b,c]	1.32 (.24)[e]	1.09 (.26)[g]	1.46 (.11)[h]	2.26 (.17)	9.99	4,700	**<.001**	.05
Technology	1.05 (.05)[c]	1.41 (.20)[d]	1.06(.22)[g]	.90 (.09)[h]	1.73 (.14)	6.89	4,700	**<.001**	.04
Living situation	0.95 (.05)	.98 (.20)	0.83 (.22)	1.03 (.09)	1.44 (.14)	2.86	4,700	.023	.02
Adherence to COVID precautions	1.88 (.04)	2.04 (.19)	1.94 (.21)	2.01 (.09)	2.24 (.13)	1.87	4, 700	.114	.01
Pandemic-related stress items									
Health/safety	2.10 (.06)[b,c]	2.29 (.25)[e]	2.52 (.28)	2.56 (.12)	2.95 (.18)	7.19	4, 700	**<.001**	.04
Mental health	2.35 (.06)[b,c]	2.67 (.28)[d,e]	2.61 (.30)[f,g]	3.42 (.13)	3.42 (.20)	18.03	4, 700	**<.001**	.09
Uncertainty about the future	2.77 (.06)[b,c]	3.12 (.28)	2.86 (0.31)[g]	3.16 (.13)[h]	3.73 (.20)	6.35	4, 700	**<.001**	.04
Access to health care	0.86 (.05)[c]	1.13 (.22)[e]	0.94 (.24)[g]	0.95 (.10)[h]	1.81 (.15)	8.69	4, 700	**<.001**	.05

Note. Significant difference between participants with [a] no disability and participants with a learning disability (only); [b] no disability and participants with a mental health disability (only); [c] no disability and participants with comorbid disabilities; [d] a learning disability (only) and participants with a mental health disability (only); [e] a learning disability (only) and participants with comorbid disabilities; [f] a physical health disability (only) and participants with a mental health disability (only); [g] a physical health disability (only) and participants with comorbid disabilities; [h] a mental health disability (only) and participants with comorbid disabilities

have increased the risk for contracting COVID-19 (Parsloe & Smith, 2022). In addition, academic and health services upon which they rely have undergone changes in how those services are delivered due to the pandemic, which likely led to perceptions of threat. While no prior research has examined pandemic appraisals in college students or people with disabilities, a study of Chinese citizens in February of 2020 found they appraised the pandemic as highly severe (primary appraisal) and moderately controllable (secondary appraisal; Li et al., 2020). Our study, conducted 6 to 12 months after the pandemic onset in the U.S., found moderate levels of threat in college students, with those with disabilities perceiving significantly greater threat but not as high as that found in Chinese citizens earlier in the pandemic. With regard to secondary appraisal, college students had moderate to high appraisals of uncontrollability and inability to cope, with greater levels in those with disabilities (but not significantly different), which is in contrast to the moderate controllability appraisal of the Chinese citizen sample. These differences in study results may be due to study differences pertaining to samples, phase of the pandemic, and measures of appraisal.

A second trend in our results is that students with MDO, LDO, and CoMLPDs reported significantly greater general stress and pandemic-specific stress in various life domains compared to the NoMLPD group. While previous research has not examined pandemic stress in students with disabilities, these findings are somewhat consistent with pre-pandemic studies that found that college students with disabilities endorsed greater distress and academic stress when compared to students without disabilities (Coduti et al., 2016; Fleming et al., 2018), and a study that found that students with disabilities reported more structural barriers related to the pandemic compared to students without disabilities (Aquino & Scott, 2022). However, previous research did not examine how students with comorbid disabilities fared.

Students with CoMLPDs experienced the least favorable results overall and with regard to pandemic-specific stress, which makes sense as by the nature of having comorbid disabilities, they are more likely to have more life domains that are impacted than students with one type of disability or no disability. Students with CoMLPDs experienced greater pandemic-specific stress in domains related to college (i.e., academics and technology), health (i.e., health and safety, mental health, access to healthcare) and other domains compared to students with no disability or one type of disability. The findings pertaining to college and health domains may be due to the additional concerns about healthcare access and safety (Lund et al., 2020) and adapting to adjusted academic accommodations due to pandemic restrictions. A study of adults with disabilities during the pandemic found that over half of those receiving regular healthcare treatment experienced disruption in access to treatment, over half of those continuing to receive direct care services were unable to maintain a safe distance from their provider, and 44% experienced new challenges to obtaining healthcare treatment, access, and/or prescriptions (Drum et al., 2020). Since courses, academic support services, and some healthcare services were primarily accessed through technology, it is likely that academic and health concerns interacted with technology concerns. For students with CoMLPDs, the pandemic may have exacerbated pre-existing stressors and increased stress due to new barriers affecting healthcare and academic support services, and other areas of life.

Students with mental health disabilities had the second least favorable results overall and with regard to pandemic-specific stress. This is consistent with a pre-pandemic study that found students with psychological disabilities had greater indicators of mental distress compared to those with other types of disabilities (Coduti et al., 2016). Experiencing more psychological symptoms (e.g., anxiety, depression) may predispose one to have more concerns and worries across a variety of domains of stress. Students with mental health disabilities experienced greater pandemic-specific stress in college (i.e., academics), health (i.e., health and safety, mental health) and other domains compared to students with no disability. It is interesting that college students with MDO did not endorse greater stress related to access to medical resources. Perhaps most of the participants in this study with a mental health disability did not experience undue stress related to any gap in mental healthcare or change to telehealth for mental healthcare. Some support for this idea comes from the study of adults with disabilities during the pandemic by Drum and colleagues (2020), who found in those taking medication, 4% reported access to prescriptions was affected, and for those experiencing anxiety and depression, 16% reported access to emotional support and services was affected.

A third trend observed in the results is that there were no significant differences in study variables found between students with PDO compared to students with NoMLPD. Perhaps there were potential benefits of shifting from in-person to virtual instruction, moving out of residence halls, or switching to telehealth for healthcare access for students with physical disabilities. Previous studies have highlighted how online classes may have enabled discreet use

of accommodations and reduced commuting demands, ultimately lessening physical exertion and subsequent pain (Hong et al., 2015; Kimball et al., 2016). It is possible that switching to telehealth appointments for some services also reduced commuting demands for students with PDO. With the closure of residence halls, many students moved back home, reducing the number of people they were exposed to and where they may have had family who could provide support. Therefore, the similarities across threat appraisal, general stress, and COVID-19-specific stress among students with PDO compared to students with NoMLPD could be attributed, in part to the lesser demands of physical exertion, increased access to virtual learning and healthcare, as well as decreased risk of contracting COVID due to reduced exposure to people.

Practical Implications

Given our results, we believe that there are practical implications for colleges and universities, and particularly disability support specialists. Overall, there has been a general trend of reported increased mental health concerns among college students across the pandemic, as well as the past ten years (Aquino & Scott, 2022; Lipson et al., 2018). This is consistent with our results, which suggest that these students have experienced the pandemic as stressful, and those with a mental health disability and comorbid disabilities (all of whom had a mental health disability) significantly more so. This increased stress could have a significant impact on academic outcomes and careers; however, students who experience mental health disabilities often do not receive the support that they need on college campuses (Davis, 2021). For example, Davis's (2020) report found that 70 percent of students with mental health disabilities did not register for accommodations, often because of lack of knowledge about accommodations, thinking that they were "not sick enough" to receive accommodations, or mental health stigma. Additionally, students receiving accommodations reported that their needs changed during the pandemic, especially with the shift to online courses. We believe that there is an opportunity for colleges and universities to enhance support services (and coordination and collaboration among student support programs and centers) for students with disabilities, especially those with mental and comorbid disabilities. Given the lack of clarity around accommodations for mental health disabilities, a role for disability support services may include providing increased education and outreach on accommodations for mental health. Davis (2021) suggests that this education may occur at places in which information on mental health is already disseminated, such as first-year orientation and community events, and through student-led organizations and campus partners such as the counseling center.

This education and outreach is not only important for students and their families, but also for faculty and staff members. Davis (2021) found that one in four students with mental health disabilities were reluctant to speak to their instructors about accommodations; in addition, instructors often treated students' mental health concerns with suspicion (Kain et al., 2019). Disability support services may play a role in providing education to faculty members about mental health, as well as clarification of guidelines for accommodations for students with mental health conditions. In addition, they may also provide education and guidance to faculty about working with students who experience mental health conditions but are not registered with disability support services. These students may benefit from faculty who are knowledgeable about mental health, as well as the process of registering with disability support services and receiving accommodations. An increased collaboration between disability support services and faculty members, therefore, would reach a wider range of students, while helping to decrease stigma by normalizing conversations about mental health.

Given that our findings have highlighted elevated stress levels among students with CoMLPD as related to academics and technology in the face of COVID-19, it would be advantageous for disability support services in conjunction with other campus partners (e.g., faculty development center), to encourage instructor flexibility across attendance and grading policies and provide extended access to technological resources for students who may not have access to laptops, hotspots, or webcams. While many institutions have returned to in-person instruction at this chronic stage of the pandemic, it is helpful to maintain hybrid models of learning that offer inherent flexibility while easing students' concern for potential COVID-19 exposure as well as providing a virtual option in the event of future public health emergencies. As previous research (e.g., Parsloe & Smith, 2022) has suggested, students with PDO may be better served by online courses; however, students with CoMLPD may benefit from more flexibility with regard to in-person and online instruction. In order to ensure the safety of students with disabilities while minimizing forced dependence on virtual learning, universities may also consider keeping in place pandemic-era precautions, such as physical distancing and mask mandates.

It would also be advantageous for disability support services and/or faculty development centers to provide guidelines and training modules for apply-

ing the principles of Universal Design (UD) to both online and in-person instruction. The original UD framework was designed to support adaptations that are built into the architectural environment rather than added on. UD principles consist of (a) equitable use, (b) flexibility in use, (c) simple and intuitive use, (d) perceptible information, (e) tolerance for error, (f) low physical effort, and (g) size and space for approach and use (Center for Excellence in Universal Design, 2020). Universal Design for Instruction (UDI) and Universal Design for Learning (UDL) present complementary extensions for higher education to actively reduce barriers encountered by college students with and without disabilities. UDI focuses on proactive, intentional design and instructional strategies in order to ensure equitable and accessible classroom environments (McGuire et al, 2003). For example, the principle of "flexibility in use" in UDI means that instruction accommodates a broad range of abilities while providing choice in methods, while "tolerance for error" in UDI refers to anticipating the variation in individual student learning and skills (Scott et al., 2003). UDI includes two additional principles of "a community of learners" (promoting interaction between faculty and students) and "instructional climate" (designed to be inclusive, with high expectations for all students; Scott et al., 2003). UDL focuses on eliminating barriers to learning by considering the purpose of learning environments (Rose et al., 2006). UDL has three principles: multiple means of representation (i.e., presenting information to students in multiple ways), engagement (i.e., allowing students to engage with material in multiple ways), and action and expression (i.e., allowing students to communicate their knowledge and responses to information in multiple ways; CAST, 2008; Rose et al., 2006). These principles encourage active course engagement with an enriching learning experience, regardless of disability. UDI and UDL offer proactive approaches to ensure equitable teaching and learning environments, inherently reducing the need for individualized accommodations through the mitigation of structural barriers for students with disabilities.

Course instructors would benefit from UD-inspired guidelines and training modules when navigating the delivery of virtual instruction, anticipating, and preparing for the diverse range of student needs. Efforts to improve clarity are necessitated, particularly with elevated pandemic-related stress and distress levels, confounding one's ability to process and absorb new information. Students with disabilities could especially benefit from instructors who abide by the standards of UD in the construction of their online course delivery. Equitable education can be facilitated by providing closed captioning and text-to-audio conversion software, while promoting increased engagement and enhanced accessibility of material for students with learning or physical disabilities (Dallas et al., 2016; Gernsbacher, 2015). Students with disabilities may also benefit from classroom instruction that accounts for diverse learning preferences, with lectures provided in various formats, and assignments that offer multiple means of action and expression (Boothe et al., 2018; CAST, 2018). In addition, to reduce loneliness and isolation, students may also benefit from cooperative or collaborative assignments that foster a learning community within the in-person or virtual classroom space. Overall, striving for an equitable learning environment will enable instructors and universities to flexibly adjust to student needs.

Another way that colleges and universities can support students with disabilities is to enhance communication and coordination among centers and offices that provide resources for students, including disability support services, libraries, counseling centers, and tutoring or writing centers. Coordination across centers and departments would ensure that students who receive support in one area are connected to other services across campus. As the current study found that many students with disabilities experienced concerns related to technology, disability support services could provide information about existing campus technology resources, such as laptop or hotspot rentals and computer labs could increase access. In addition, they could work with library staff to create tutorials for students about how to find captioned media or PDFs that are compatible with screen readers. Providing education about UDL to tutoring and writing center staff, would enable staff to use UDL techniques as part of their instruction or tutoring with students with disabilities (e.g., using multiple methods of instruction and multiple ways to demonstrate knowledge).

Beyond education, disability support services may also partner with departments, other campus partners, and student-led organizations to promote inclusivity and celebrate mental health as part of disability culture (Davis, 2021). This may include developing and promoting disability studies courses or establishing Disability Cultural Centers. Chiang (2020) describes Disability Cultural Centers as spaces to normalize disability and communicate value for disability. Given the increased isolation associated with the pandemic, which likely exacerbated mental health concerns, these centers may provide space for connection and community for students with disabilities. While disability support services would be only one of several campus partners in this effort, their role

may be to advocate for the creation of these centers or courses, as well as to educate and promote their use among students and faculty.

Limitations and Future Directions

There were several limitations to this research. First, physical and learning disabilities were self-reported and non-specific; therefore, students' endorsement of a disability's presence may not translate to the wider disability community. Additionally, the mental health disability category was created using self-report in combination with cut-off scores for major depression, generalized anxiety, social anxiety, panic, and specific phobia disorders. Thus, students who fell below the cut-offs or presented with other mental health conditions or disabilities (e.g., post-traumatic stress disorder) may not have been included. Future researchers could help further clarify and specify the operationalization of types of disabilities in relation to college student stress. Further, the low alphas on the "Other" Specific Phobia Questionnaire subscale (Ovanessian et al., 2019) and secondary appraisal measure (Folkman et al., 1986) may mean that some items were not representative of these constructs. Thus, results pertaining to these measures should be interpreted with caution and other measures should be considered in the future.

Participants were surveyed 6-12 months after pandemic onset in the U.S. Consequently, this time frame did not capture initial adjustments to the pandemic or provide a baseline measure of pre-pandemic stress to be able to demonstrate changes in appraisal and stress. Another limitation pertains to the sample, which included participants who primarily identified as White, female, freshmen, and continuing generation college students, and was over-representative of women, people of color, freshmen, and first-generation college students compared to the university's undergraduate population (East Carolina University, 2022). While statistics controlled for demographics, these sample characteristics should be taken into consideration when interpreting the results and their generalizability. Additionally, the findings may not reflect stressors identified by those with intersectional identities, such as students of color who have a disability and first-generation college students who have a disability, who would likely face additional stressors (Lund et al., 2020). Future research may examine the pandemic's ongoing impact on these student populations in order to understand their unique stressors and develop ways to support them.

Conclusion

COVID-19 has presented an abundance of stressors for college students, which could be mitigated by taking a preventative and proactive approach. Overall, compared to students without disabilities, students with mental disabilities and comorbid mental, learning, and physical disabilities appraised the pandemic as more threatening and reported greater general stress and pandemic-specific stress in college, health and safety, and other life domains. Our results emphasize the importance of mental health with regard to students' appraisals of pandemic-related stressors and vulnerability to heightened stress. These findings further emphasize the need to provide education to students and faculty about accommodations, especially for mental health disabilities, provide guidelines and training to faculty on UD principles, and collaborate across campus departments to better serve students with disabilities. As the pandemic is dynamic and changing, future research should continue to examine pandemic appraisals and stressors, especially among college students with mental health, learning, and/or physical disabilities, in order to provide recommendations to student support professionals.

References

Aguilar, O., & Lipson, S. K. (2021). A public health approach to understanding the mental health needs of college students with disabilities: Results from a national survey. *Journal of Postsecondary Education & Disability, 34*(3), 272–285.

Americans With Disabilities Act of 1990, 42 U.S.C. § 12102 et seq. (1990).

Americans With Disabilities Amendments Act of 2008, 42 U.S.C. § 12101 et seq. (2008).

Andersen, L. M., Harden, S. R., & Lundquist, T. E. (2021). Analyzing the spatial determinants of local COVID-19 transmission in the United States. *The Science of the Total Environment, 754*, 142396. https://doi.org/10.1016/j.scitoenv.2020.142396

Aquino, K. C., & Scott, S. (2022). "They're coming in pretty defeated": Mental health during the COVID-19 pandemic (Practice Brief). *Journal of Postsecondary Education & Disability, 35*(2), 175–182.

Batterham, P. J., Mackinnon, A. J., & Christensen, H. (2015). The Panic Disorder Screener (PADIS): Development of an accurate and brief population screening tool. *Psychiatry research, 228*(1), 72–76. https://doi.org/10.1016/j.psychres.2015.04.016

Batterham, P. J., Mackinnon, A. J., & Christensen, H. (2017). Community-based validation of the Social Phobia Screener (SOPHS). *Assessment, 24*(7), 958–969. https://doi.org/10.1177/1073191116636448

Boothe, K. A., Lohmann, M. J., Donnell, K. A., & Hall, D. D. (2018). Applying the principles of universal design for learning (UDL) in the college classroom. *Journal of Special Education Apprenticeship, 7*(3), n3.

CAST. (2018). *Universal Design for Learning Guidelines version 2.2*. http: //udlguidelines.cast.org

Carroll, J. M., Pattison, E., Muller, C., & Sutton, A. (2020). Barriers to bachelor's degree completion among college students with a disability. *Sociological Perspectives, 63*(5), 809–832. https://doi.org/10.1177/0731121420908896

Center for Excellence in Universal Design (2020). *The 7 principles.* National Disability Authority. https://universaldesign.ie/what-is-universal-design/the-7-principles/

Chiang, E. S. (2020). Disability cultural centers: How colleges can move beyond access to inclusion. *Disability & Society, 35*(7), 1183–1188. https://doi.org/10.1080/09687599.2019.1679536

Coduti, W. A., Hayes, J. A., Locke, B. D., & Youn, S. J. (2016). Mental health and professional help-seeking among college students with disabilities. *Rehabilitation Psychology, 61*(3), 288 –296. https://doi.org/10 .1037/rep0000101

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*, (2nd ed.). Erlbaum.

Cohen, A. K., Hoyt, L. T., & Dull, B. (2020). A descriptive study of COVID-19–related experiences and perspectives of a national sample of college students in spring 2020. *Journal of Adolescent Health, 67*(3), 369–375. https://doi.org/10.1016/j.jadohealth.2020.06.009

Cohen, S., & Williamson, G. M. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health* (pp. 31–67). Sage Publications, Inc.

Connell, B., Jones, M., Mace, R., Mueller, J., Mullick, A., Ostroff, E.,…Vanderheiden, G. (1997). *The principles of universal design: Version 2.0.* The Center for Universal Design.

Dallas, B., McCarthy, A., & Long, G. (2016). Examining the educational benefits of and attitudes toward closed-captioning among undergraduate students. *Journal of the Scholarship of Teaching and Learning, 16*(2), 56–71. https://doi.org/10.14434/josotl.v16i2.19267

Davis, K. A. (2020). *Disability and campus mental health: Understanding the experiences of college students during the COVID-19 pandemic.* Mental Health America. https://mhanational.org/get-involved/2020-disability-and-campus-mental-health-report

Davis, K. A. (2021). *Supporting college students: Mental health and disability in higher education.* Mental Health America. https://archive.hshsl.umaryland.edu/handle/10713/16414

Drum, C. E., Oberg, A., Cooper, K., & Carlin, R. (2020). *COVID-19 & adults with mobility disabilities: Health and health care access online survey report*. American Association on Health and Disability. https://www.aahd.us/wp-content/uploads/2020/05/COVID-19_Summary_Report.pdf

East Carolina University. (2022, October 4). *University dashboard: Enrollment.* https://ipar.ecu.edu/power_bi/enrollment/

Flaherty, C. (2020, November 30). Pass/fail hardball: Students seek pass-fail options again for Fall in light of Covid-19. *Inside Higher Ed*. https://www.insidehighered.com/news/2020/11/30/students-seek-pass-fail-options-again-fall-light-covid-19

Fleming, A. R., Edwin, M., Hayes, J. A., Locke, B. D., & Lockard, A. J. (2018). Treatment-seeking college students with disabilities: Presenting concerns, protective factors, and academic distress. *Rehabilitation Psychology, 63*(1), 55– 67. https://doi.org/10.1037/rep0000193

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50*(5), 992–100. https://doi.org/10.1037//0022-3514.50.5.992

Gernsbacher, M. A. (2015). Video captions benefit everyone. *Policy Insights from the Behavioral and Brain Sciences, 2*(1), 195–202. https://doi.org/10.1177/2372732215602130

Gleason J, Ross W, Fossi A, Blonsky H, Tobias J, & Stephens M (2021). The devastating impact of COVID-19 on individuals with intellectual disabilities in the United States. New England *Journal of Medicine Catalyst Innovations in Care Delivery, 2*(2) 1–12. https://doi.org/10.1056/CAT.21.0051

Goldrick-Rab, S., Coca, V., Kienz1, G., Welton, C., Dahl, S., Magnelia, S. (2021). *#REALCOLLEGE during the pandemic: New evidence on basic needs insecurity and student well-being.* Hope Center for College, Community, and Justice. https://hope4college.com/wp-content/uploads/2020/06/Hopecenter_RealCollegeDuringthePandemic.pdf

Gruber, J., Prinstein, M. J., Clark, L. A., Rottenberg, J., Abramowitz, J. S., Albano, A. M., Aldao, A., Borelli, J. L., Chung, T., Davila, J., Forbes, E. E., Gee, D. G., Hall, G. C. N., Hallion, L. S., Hinshaw, S. P., Hofmann, S. G., Hollon, S. D., Joormann, J., Kazdin, A. E., … Weinstock, L. M. (2021). Mental health and clinical psychological science in the time of COVID-19: Challenges, opportunities, and a call to action. *American Psychologist, 76*(3), 409–426. https://doi.org/10.1037/amp0000707

Hong, B. S. S. (2015). Qualitative analysis of the barriers college students with disabilities experience in higher education. *Journal of College Student Development, 56*(3), 209–226. https://doi.org/10.1353/csd.2015.0032

Kain, S., Chin-Newman, C., & Smith, S. (2019). "It's all in your head": Students with psychiatric disability navigating the university environment. *Journal of Postsecondary Education and Disability, 32*(4), 411–425.

Kecojevic, A., Basch, C. H., Sullivan, M., & Davi, N. K. (2020). The impact of the COVID-19 epidemic on mental health of undergraduate students in New Jersey, cross-sectional study. *PloS One, 15*(9), e0239696. https://doi.org/10.1371/journal.pone.0239696

Kimball, E. W., Wells, R. S., Ostiguy, B. J., Manly, C. A., & Lauterbach, A. A. (2016). Students with disabilities in higher education: A review of the literature and an agenda for future research. In M. B.Paulsen (Ed.), *Higher education: Handbook of theory and research* (Vol. 31, pp. 91–156). Springer. https://doi.org/10.1007/978-3-319-26829-3_3

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders, 114*(1-3), 163–173. https://doi.org/10.1016/j.jad.2008.06.026

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.

Lederer, A. M., Hoban, M. T., Lipson, S. K., Zhou, S., & Eisenberg, D. (2021). More than inconvenienced: The unique needs of US college students during the COVID-19 pandemic. *Health Education & Behavior, 48*(1), 14–19. https://doi.org/10.1177/1090198120969372

Li, J. B., Yang, A., Dou, K., Wang, L. X., Zhang, M. C., & Lin, X. Q. (2020). Chinese public's knowledge, perceived severity, and perceived controllability of COVID-19 and their associations with emotional and behavioural reactions, social participation, and precautionary behaviour: A national survey. *BMC Public Health, 20*(1), 1–14. https://doi.org/10.1186/s12889-020-09695-1

Lund, E. M., Forber-Pratt, A. J., Wilson, C., & Mona, L. R. (2020). The COVID-19 pandemic, stress, and trauma in the disability community: A call to action. *Rehabilitation Psychology, 65*(4), 313–322. https://doi.org/10.1037/rep0000368

McGuire, J. M., Scott, S. S., & Shaw, S. F. (2003). Universal design for instruction: The paradigm, its principles, and products for enhancing instructional access. *Journal of Postsecondary Education and Disability, 17*(1), 11–21.

National Center for Education Statistics. (2019). *The NCES Fast Facts Tool provides quick answers to many education questions.* U.S. Department of Education. https://nces.ed.gov/fastfacts/display.asp?id=60

Newman, L., Wagner, M., Knokey, A.-M., Marder, C., Nagle, K., Shaver, D., Wei, X., with Cameto, R., Contreras, E., Ferguson, K., Greene, S., & Schwarting, M. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school.* National Center for Special Education Research. https://ies.ed.gov/ncser/pubs/20113005/

Okoro, C. A., Hollis, N. D., Cyrus, A. C., & Griffin-Blake, S. (2018). Prevalence of disabilities and health care access by disability status and type among adults—United States, 2016. *Morbidity and Mortality Weekly Report, 67*(32), 882. https://doi.org/10.15585/mmwr.mm6732a3

Ovanessian, M. M., Fairbrother, N., Vorstenbosch, V., McCabe, R. E., Rowa, K., & Antony, M. M. (2019). Psychometric properties and clinical utility of the Specific Phobia Questionnaire in an anxiety disorders sample. *Journal of Psychopathology and Behavioral Assessment, 41*(1), 36–52. 10.1007/s10862-018-9687-1

Park, C. L., Finkelstein-Fox, L., Russell, B. S., Fendrich, M., Hutchison, M., & Becker, J. (2021). Americans' distress early in the COVID-19 pandemic: Protective resources and coping strategies. *Psychological Trauma, 13*(4), 422–431. https://doi.org/10.1037/tra0000931

Parsloe, S. M., & Smith, E. M. (2022). COVID as a catalyst: Shifting experiences of disability and (mis)fitting in the college classroom. *Communication Education, 71*(3), 204–222. https://doi.org/10.1080/03634523.2022.2078497

Pfefferbaum, B., & North, C. S. (2020). Mental health and the COVID-19 pandemic. *New England Journal of Medicine, 383*(6), 510–512. https://doi.org/10.1056/NEJMp2008017

Roberti, J. W., Harrington, L. N., & Storch, E. A. (2006). Further psychometric support for the 10-item version of the Perceived Stress Scale. *Journal of College Counseling, 9*(2), 135–147. https://doi.org/10.1002/j.2161-1882.2006.tb00100.x

Rose, D. H., Harbour, W. S., Johnston, C. S., Daley, S. G., & Abarbanell, L. (2006). Universal design for learning in postsecondary education: Reflections on principles and their application. *Journal of Postsecondary Education and Disability, 19*(2), 135–151.

Rosebruck, L., Černis, E., Lambe, S., Waite, F., Rek, S., Petit, A., Ehlers, A., Clark, D. & Freeman, D. (2021). Catastrophic cognitions about coronavirus: The Oxford Psychological Investigation of Coronavirus Questionnaire [TOPIC-Q]. *Psychological Medicine*, 1–10. https://doi:10.1017/S0033291721000283

Scott, S. S., McGuire, J. M., & Foley, T. E. (2003). Universal design for instruction: A framework for anticipating and responding to disability and other diverse learning needs in the college classroom. *Equity & Excellence in Education, 36*(1), 40–49. https://doi.org/10.1080/10665680303502

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research, 22*(9), e21279. https://doi.org/10.2196/21279

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine, 166*(10), 1092–1097. https://doi.org/ 10.1001/archinte.166.10.1092

Starick, E., Montemarano, V., & Cassin, S. E. (2021). Coping during COVID-19: The impact of cognitive appraisal on problem orientation, coping behaviors, body image, and perceptions of eating behaviors and physical activity during the pandemic. *International Journal of Environmental Research and Public Health, 18*(21), 11305. https://doi.org/10.3390/ijerph182111305

Verduzco-Gutierrez, M., Lara, A. M., & Annaswamy, T. M. (2021). When disparities and disabilities collide: Inequities during the COVID-19 pandemic. *PM&R, 13*(4), 412-414. https://doi.org/10.1002/pmrj.12551

Wang, X., Hegde, S., Son, C., Keller, B., Smith, A., & Sasangohar, F. (2020). Investigating mental health of US college students during the COVID-19 pandemic: Cross-sectional survey study. *Journal of Medical Internet Research, 22*(9), e22817. https://doi.org/10.2196/22817

About the Authors

Lauren Conder received her B.A. degree in psychology from the University of North Carolina at Chapel Hill, M.A. degree in Psychology from Western Carolina University, and Ph.D. from East Carolina University. She is currently a psychology fellow at the Durham Veterans Affairs focusing on behavioral medicine and psychology within primary care settings. Her research interests include stress, increasing accessibility in mindfulness interventions, and mental health in students with disabilities. She can be emailed by email at conderl18@students.ecu.edu.

Sarah Vanacore received her B.A. in English Literature from Eastern University, her M.A. in English from the University of Pennsylvania, and M.A. in Psychology from Rutgers University-Camden. She is currently a student in the Clinical Health Psychology Ph.D. program at East Carolina University. Her research interests include stress and coping, particularly how coping strategies and flexibility in coping facilitate psychosocial adjustment, well-being, and growth. She can be reached by email at vanacores19@students.ecu.edu.

Alia Simon received her B.A. degree in psychology from the University of Tampa. She is currently a Clinical Health Psychology doctoral student at East Carolina University. Her research interests include stress, interoception, psychopathology, and mindfulness. She can be reached by email at: simonal21@students.ecu.edu.

Christyn Dolbier received her B.S. degree in psychology from Eckerd College, M.S. degree from University of Florida and Ph.D. from University of Texas at Austin. She is currently an associate professor in the Department of Psychology at East Carolina University. Her research interests include stress, coping, and resilience. She can be reached by email at: dolbierc@ecu.edu.

Appendix

Pandemic Stress Item Factor Loadings

Item	Factor Loading								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Missing getting to be with the people you used to spend time with due to the pandemic.	.73	-.06	-.03	.13	.12	-.02	.07	-.07	-.05
Missing getting to attend university sponsored gatherings and events (e.g., athletic events, concerts, movies, festivals) due to the pandemic.	.59	.17	-.07	-.11	.08	.02	.10	-.02	-.05
Not being able to do your usual social activities (e.g., movies, dining out, sports, clubs) due to the pandemic.	.95	-.06	-.01	-.05	-.05	.01	-.07	-.02	.08
Activities you were looking forward to being cancelled or postponed (e.g., concerts, vacations) due to the pandemic.	.87	-.06	-.01	.01	-.04	-.02	-.01	.03	-.01
Not being able to exercise like you used to due to fitness center closures or restrictions due to the pandemic.	.67	-.02	.04	-.04	-.04	-.03	-.06	.14	.05
Having to stay home due to the pandemic.	.73	.11	.04	-.06	-.03	.01	-.00	-.04	.01
Having to figure out things you can do for enjoyment/entertainment that are safe given the pandemic.	.78	.11	.01	.01	-.02	-.04	-.05	.04	-.04
Being physically separated from those you feel close to due to the pandemic.	.64	-.04	.02	.18	.09	-.01	.05	-.05	-.03
Lack of or confusing information from your course instructors related to the pandemic.	.03	.40	.02	-.02	.06	.16	.03	.04	.03
Adjusting to a different kind of work for your courses due to the pandemic.	-.05	.95	-.07	.01	.04	-.03	-.03	.01	-.04
More distractions in your current living arrangement due to the pandemic.	-.03	.60	.01	.02	-.02	.13	.10	.07	-.05
Disruption in your regular routine due to the pandemic.	.15	.59	.05	.02	.01	.11	.05	-.01	.00
Lack of structure in your day due to the pandemic.	.17	.64	-.02	.01	-.07	.05	.06	-.03	.04
Adjusting to a different format for your courses (e.g., online or hybrid) due to the pandemic.	.01	.94	-.02	-.01	-.03	-.12	.00	.02	-.00
Difficulty keeping up with coursework due to the pandemic.	-.05	.89	.04	.03	-.01	-.03	-.07	.01	.01
Adjusting to a different schedule for your courses (i.e., fewer courses at faster pace for each block) due to the pandemic.	.04	.85	.01	.02	.02	-.11	-.05	-.05	.05
Lack of or confusing information from your employer related to the pandemic.	-.02	.05	.84	-.01	-.02	.05	-.08	.01	-.01

Item	Factor Loading								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Adjusting to a different kind of work for your employer due to the pandemic.	.08	.05	.86	.01	-.03	-.08	.01	-.01	-.04
Having to go to work without appropriate personal protective equipment.	-.03	-.04	.74	-.04	.09	.01	.11	.06	-.13
Dissatisfaction with work policies related to the pandemic.	-.06	-.02	.83	.08	.02	.03	.03	-.02	-.10
Adjusting to working remotely due to the pandemic.	.06	-.04	.66	-.05	-.02	-.00	.02	-.01	.05
Concern about your job security due to the pandemic.	-.02	-.03	.72	.02	-.04	-.01	-.06	-.04	.23
Concern that others are not taking the pandemic seriously.	-.13	.13	.00	.76	.07	.00	-.02	-.07	.05
Concern about the death toll due to the pandemic.	-.00	-.02	.00	.85	.00	.00	-.02	-.00	-.07
Concern for the economy due to the pandemic.	.16	-.05	-.01	.56	-.02	.04	-.00	.07	.05
Concern for the impact of the pandemic on the welfare of others.	.12	.02	-.03	.82	-.03	-.01	-.00	.04	-.03
Concern about the unemployment rate due to the pandemic.	.00	-.01	.03	.80	-.06	-.00	.05	.00	.05
Concern about your loved ones not being able to get needed food or household items due to the pandemic.	.03	-.02	.03	-.03	.81	.06	-.04	-.02	.04
Concern about your loved ones not being able to get needed medical care or health related items (e.g., prescriptions) due to the pandemic.	-.00	.04	-.03	.03	.86	-.03	-.05	.00	.00
Concern about your loved ones not being able to get needed protective supplies (e.g., face masks, hand sanitizer) due to the pandemic.	.00	.02	.03	.02	.87	-.05	.00	.00	-.01
Concern about where your loved ones will live due to the pandemic.	-.02	-.03	-.05	-.04	.58	.07	.09	.03	.04
Difficulty keeping up with information coming in about the pandemic	.06	.04	-.01	.08	-.01	.66	.00	-.00	.03
Lack of or confusing information about what to do to keep yourself and others safe from the coronavirus.	-.10	-.05	-.01	.06	.02	.94	-.09	-.00	.04
Difficulty adhering to what is recommended to keep yourself and others safe from the coronavirus.	.00	-.07	.00	-.06	.02	.89	.02	.00	-.02
Having to maintain restrictions and disruptions to your usual routine due to the pandemic.	.19	.16	.04	-.06	-.02	.54	.03	-.02	-.06
Having to live somewhere different from where you lived before the pandemic.	-.04	-.00	.01	.01	-.01	-.07	.75	.03	.10
Having to move due to the pandemic.	.03	.02	.02	-.06	-.02	-.03	.81	-.11	.06

Item	Factor Loading								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
More crowded living arrangement than before the pandemic.	-.04	-.06	-.02	.06	.05	.01	.68	.11	-.12
Not liking your current living arrangement.	.02	.04	.03	-.01	-.05	.03	.50	.01	.06
Lack of or difficulty accessing a computer and the internet due to the pandemic.	.03	-.04	-.02	.02	.02	-.05	-.01	.83	.02
Technological difficulties (e.g., trouble with a software program being used for class or work) due to the pandemic.	.01	.15	-.03	-.03	.00	.07	-.07	.68	.01
Competing with others for the use of a computer or the internet due to the pandemic.	-.01	-.03	.05	.01	.00	-.01	.13	.68	.01
Concern for your financial security due to the pandemic.	-.03	-.00	.04	.04	.05	.07	.03	.01	.70
Needing a job and not being able to find one due to the pandemic.	.04	.01	-.13	.04	-.04	.06	.11	-.04	.63
Difficulty paying bills due to financial changes related to the pandemic.	.01	.01	.07	-.04	.08	-.09	-.04	.07	.80