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College Student Depression Throughout COVID-19: Fall 2019-Spring 2022

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ABSTRACT

The current study examines the trends in depression and emotion regulation for students ($n = 899$) at one university in the midwestern United States from prior to the COVID-19 pandemic (Fall 2019) through the Spring 2022 semester. An analysis of covariance (ANCOVA) was conducted, controlling for difficulties in emotion regulation and gender identity. The ANCOVA indicated that depression was significantly lower in Fall 2019 than in the remaining five semesters under investigation. Results of these analyses appear to indicate that depression rose significantly in students after the onset of the pandemic and implementation of social restrictions. This negative effect appears to have had a lasting impact, and the pandemic

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appears to have had deleterious effects on mental health regardless of emotion-regulation abilities and/or gender identity. Limitations and implications for researchers, clinicians, and professionals in higher education will be discussed.

KEY WORDS Depression; Emotion Regulation; COVID-19; Mental Health; Well-Being

The World Health Organization declared COVID-19 a pandemic on March 11, 2020. Since that time, the United States has seen more than 97 million COVID-19 cases and more than 1 million deaths due to COVID-19 as of the writing of this article (Centers for Disease Control and Prevention [CDC] 2022). In response to the threat of COVID-19, policies were rapidly implemented at the federal and state levels to slow the propagation of the disease. Large-scale restrictions such as social distancing, remote work, and online learning became widespread across the United States, albeit not without social and personal consequences. Researchers have focused on evaluating the impact that this period of uncertainty and the measures taken to slow the spread of COVID-19 have had on mental health throughout the pandemic as well as what factors may increase risk for negative mental health outcomes, specifically depression (e.g., Elmer, Mephram, and Stadtfeld 2020; Trougakos, Chawla, and McCarthy 2020; Ustun 2021). Professionals in higher education have been particularly interested in the mental health of college students during the COVID-19 pandemic and its coinciding social-distancing policies. In the current article, we provide evidence of the deleterious effects that COVID-19 and social distancing have had on individuals' mental health as well as how the ability to regulate emotions may affect one's mental health. We then highlight the pandemic's impact on student mental health at one midwestern U.S. institution, situating the data within the specific policies enacted at the university.

COLLEGE STUDENT MENTAL HEALTH DURING COVID-19

The pandemic led to a seismic shift in the way education had to be delivered to slow the spread of COVID-19, especially in Spring 2020, when much was still unknown about the disease. In fact, 84% of undergraduate students had some or all of their classes moved to online-only formats in Spring 2020 (National Center for Education Statistics [NCES] 2021). A reorganization of this size, scale, and suddenness had not occurred in recent history, leaving administrations uncertain of what the mental health repercussions for students would be, and leading scholars to collect data on students' psychological well-being. As the data came in, reports indicated high prevalence of loneliness, anxiety, and depression among college students (Elmer et al. 2020; Horigian, Schmidt, and Feaster 2021; Soria and Horgos 2021; Tuason, Güss, and Boyd 2021). The detrimental psychological outcomes observed in the months following the outbreak could have been caused by many factors, driving a need to understand what risk factors contributed to students' poorer mental health throughout the pandemic.

Although it is not feasible for the current article to provide an exhaustive review of mental health research done throughout COVID-19, we will highlight several factors that are particularly relevant for the sample in the current study. In South Africa, Padmanabhanunni (2022) found sense of coherence during the pandemic (the ability to appraise life events as comprehensible, meaningful, and manageable; Antonovsky 1993) to have both direct and indirect associations with depression in an undergraduate sample. Specifically, sense of coherence was negatively correlated with depression, and it mediated the positive associations observed between depression and anxiety as well as between depression and hopelessness (Padmanabhanunni 2022). After the first confirmed cases of COVID-19 in Turkey, Ustun (2021) carried out a large-scale random, opportunistic study investigating the psychological impact of COVID-19 on more than 1,000 Turkish adults. Of note, depression was greatest among the young adult (18–29 years old) age group, those who had not yet completed undergraduate education, individuals whose daily routines had changed, and participants who had to change their place of residence because of the pandemic (Ustun 2021). Finally, in the United States, Chesbro et al. (2022) examined how quarantine protocols affected the psychological and physical activity behaviors of 199 University of Oklahoma students, personnel, and associates who had been in quarantine protocols for two to four weeks. Their data indicated that loneliness was positively correlated with depression, anxiety, fatigue, and total mood disturbance, whereas physical activity was negatively associated with depression and total mood disturbance (Chesbro et al. 2022). In sum, these studies indicate that students who lack a sense of coherence, are isolated, are lonely, fall in the young adult age group, have had their routines disrupted, and/or have had to relocate may be at particular risk for depression throughout the pandemic. Although these circumstances predispose an individual to mental health risks, what remains unclear is the role of an individual's ability to manage such stressful circumstances and how that may influence mental health during this unique time.

An integral characteristic for managing stressful life events (e.g., COVID-19, quarantining) is emotion regulation (Fowler et al. 2014). Emotion regulation is particularly interesting in the field of psychology because of its strong association with a wide range of psychological disorders and risky behaviors (Mennin et al. 2007; Weiss et al. 2012, 2013, 2019). Despite these relationships, emotion regulation has been understudied throughout the pandemic. Examining the ability to regulate emotion may be valuable in understanding how the pandemic has differentially affected people.

EMOTION REGULATION

Emotion regulation is the process by which a person aims (either implicitly or explicitly) to influence emotion production (Gross and Jazaieri 2014; Gross, Sheppes, and Urry 2011). More specifically, scholars generally acknowledge that emotion regulation encompasses three common factors: emotional awareness, goals, and strategies (Gratz and Roemer 2004; Gross and Jazaieri 2014). Gratz and Roemer (2004) conceptualized emotion regulation as the

- (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviors and

behave in accordance with desired goals when experiencing negative emotions, and (d) ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands. (p. 43)

Conversely, *emotion dysregulation* is a term used to describe instances of emotion regulation failures (e.g., not regulating emotions when it would be beneficial to do so) and emotion misregulation (e.g., using a form of emotion regulation that is inappropriate to the situation; Gross 2013; Gross and Jazaieri 2014). Unsurprisingly, deficits in emotion regulation have been linked to psychopathology (i.e., mental health disorders), poorer social functioning, and less personal well-being (Dan-Glauser and Scherer 2013; Gross and Jazaieri 2014; Mennin et al. 2007). Regarding psychological disorders, Gross and Jazaieri (2014) cited estimates indicating that between 40% and 75% of psychological disorders are characterized by difficulties with emotions and emotion regulation (Berenbaum et al. 2003; Gross and Muñoz 1995; Jazaieri, Urry, and Gross 2013; Kring 2008, 2010; Kring and Werner 2004; Werner and Gross 2010). Emotion regulation has thus been found to be central to the relationship between negative life events and psychopathology (Miu et al. 2022).

In order to regulate emotions, people may engage in either adaptive or maladaptive strategies (Aldao and Nolen-Hoeksema 2010; Nolen-Hoeksema 2012). Adaptive emotion regulation strategies involve modulating one's emotions such that one is able to appropriately meet the demands of one's environment and the stressors one is experiencing (Aldao, Nolen-Hoeksema, and Schweizer 2010). Conversely, maladaptive emotion regulation strategies are psychological or behavioral strategies that do not lead to successful modulation of emotions so someone can meet environmental demands. Two oft-cited examples of adaptive emotion regulation strategies are reappraisal, which involves finding/creating a positive interpretation or perspective about a stressful situation to reduce distress, and problem solving, which entails engaging in specific actions to change a stressful situation or to mitigate the situation's negative consequences (e.g., brainstorming solutions, creating a course of action to reduce stress; Aldao et al. 2010; Aldao and Nolen-Hoeksema 2010; Nolen-Hoeksema 2012). Examples of maladaptive strategies include suppressing emotional expression as well as suppressing unwanted thoughts (e.g., telling oneself *not* to think about a distressing thought) and rumination, the tendency to repetitively focus on negative emotions, thoughts, or experiences and their causes and consequences, while generally not engaging in problem-solving behavior (Aldao et al. 2010; Aldao and Nolen-Hoeksema 2010; Nolen-Hoeksema 2012).

Individuals who engage in poor emotion-regulation strategies, such as rumination, are more likely to experience psychopathology. For example, Fowler et al. (2014) note that individuals who are unable to adequately regulate emotions in the face of negative events are more likely to experience prolonged distress that may result in diagnosable depression over time (Joorman and Stanton 2016; Mennin et al. 2007; Nolen-Hoeksema et al. 2007). Additionally, individuals who have poor emotion-regulation skills are more likely to experience loneliness; coincidentally, lonely individuals are more likely to experience psychopathology (Aldao and Nolen-Hoeksema 2010; Nolen-Hoeksema 2012; Preece et al.

2021). In a time when individuals are facing a significant negative life event (i.e., the threat of COVID-19), are at an increased risk for loneliness (e.g., social distancing, quarantining, online schooling), and are likely to engage in maladaptive coping strategies because of isolation, it is thus important to assess how difficulties in emotion regulation may be contributing to someone's psychological distress.

GENDER IDENTITY, EMOTION REGULATION, AND MENTAL HEALTH

For some time, women have constituted the majority of undergraduate enrollment at U.S. institutions (NCES 2022) and have also reported a greater prevalence of mental health disorders than have their male counterparts (American College Health Association [ACHA] 2021a, 2021b, 2022); thus, it is worth considering how emotion-regulation strategies may affect college men and women differently with regard to mental health. Meta-analytic research indicates that when individuals are asked about what coping strategies they use when they are faced with stressors, women report greater use of both adaptive and maladaptive coping strategies than men do (Tamres, Janicki, and Helgeson 2002). Moreover, research suggests that women engage in rumination, in particular, more often than men do when coping with emotions. Mediation modeling indicates that this rumination may account for some of the increased depression and anxiety observed in women when compared to men (ACHA 2021a; Nolen-Hoeksema 2012). When examining the impacts of COVID-19 on college student mental health, it is therefore important in the analysis to account for gender and emotion-regulation skills to gain a clearer picture of how COVID-19 and its subsequent social restrictions have affected students.

SETTING THE CONTEXT: MIDWEST UNIVERSITY

The university from which data were collected will be referred to as Midwest University (MU) because it was a university in the midwestern United States. Like many universities (National Student Clearinghouse 2022), MU saw enrollment declines after the onset of the COVID-19 pandemic. Enrollment at MU dropped by less than 1,000 students from Fall 2019 to Fall 2021, however; thus, many of the characteristics to be described have remained relatively consistent over the span of the COVID-19 pandemic. For the 2021–2022 academic year, approximately 8,000 students were enrolled at MU across undergraduate (76.76%) and graduate (23.24%) degrees. MU is a public regional university wherein the student body comprises largely commuter students, with 76.90% of students living off campus and 40.00% of students coming from the county that the university is situated in or its contiguous counties. Moreover, 19.60% of students are out-of-state students and 1.70% are international students. Additional demographics indicate that the university is majority White (83.30%), female (64.60%), and not of first-generation student status (82.70%). A timeline of MU's response to COVID-19 from Fall 2019 to Spring 2022 is provided in Figure 1.

To fully situate MU in its institutional context, it is important to review the mental health resources available to students throughout all phases of the pandemic that will be discussed. MU provides mental health services to its students primarily through a

university counseling center (UCC). The UCC allows students 12 sessions per academic year; sessions are paid for through annual student fees, so there are no additional costs for seeking counseling through the UCC. From Fall 2019 through Spring 2022, the UCC had anywhere between two and six full-time staff counselors/social workers/psychologists. Although there are generally no wait lists at MU's UCC, the number of full-time therapists is low compared to what may be considered best practice. The International Accreditation of Counseling Services (IACS) recommends one professional staff member (i.e., clinical social worker, mental health counselor, clinical/counseling psychologist), excluding trainees, per every 1,000–1,500 students (IACS 2019). Using that metric, MU's UCC should have between five and eight full-time professional staff members. Furthermore, the average number of full-time staff at a counseling center within a school of MU's size (7,501–10,000 students) in the 2019–2020 and 2020–2021 academic years was 6.63 and 7.75, respectively (Gorman et al. 2020, 2021). This number suggests that MU generally had less than the average number of staff for a school its size and at times had less than half of the average number of full-time staff for a school of comparable size. Interestingly, the UCC received increased appointment requests every year from the Spring 2020 semester through the Spring 2022 semester, but the total number of appointments decreased each year between the 2019–2020, 2020–2021, and 2021–2022 academic years because of staff shortages. The UCC's response to the obstacles presented by COVID-19 is also provided in Figure 1.

Figure 1. Timeline of Midwest University's COVID-19 Response

Fall 2019: Before the Pandemic

- Classes provided online and in-person, the majority in-person
- University counseling center (UCC) provides in-person therapy as well as an online peer-support platform
- No social distancing or face-mask guidelines

Spring 2020: Onset of the Pandemic

- March:
 - MU closes classes for an additional week while students are on spring break, with classes to be delivered online for the additional week
 - UCC appointments are cancelled
 - MU announces that courses will be entirely online for the remainder of the semester; employees are to work remotely; all MU events are canceled for the remainder of the year
 - MU closes housing to students; students are to move out this month, with some exceptions made for students who do not have permanent residences or cannot return to their permanent residences (e.g., international students)
-

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Figure 1. Timeline of Midwest University’s COVID-19 Response, cont.

Spring 2020: Onset of the Pandemic, cont.

- April:
 - Teletherapy is established as an option for students through the UCC
 - UCC’s outreach programming via Zoom begins

Fall 2020: Ongoing Response, Part 1

- August:
 - Students are provided instruction via in-person, online, and hybrid formats
 - UCC therapy services are provided via telehealth only
 - Policies are put in place requiring decreased class sizes, six feet of social distancing in MU facilities, sanitizing of desks before and/or after classes, and that masks be worn on campus
 - COVID-19 infection protocols put in place; students who have tested positive, exhibit COVID-19 symptoms, or have been in contact with an infected person may self-report to the Dean of Students, leading to quarantine and class accommodations for absences; instructors are required to document where students sit, in order to contact trace if a student tests positive
- November:
 - Students return home for Thanksgiving break and complete the remainder of the semester from home via online instruction

Spring 2021: Ongoing Response, Part 2

- January:
 - Policies from Fall 2020 semester (masks requirement, decreased class sizes, quarantining, etc.) remain in place
 - UCC therapy services are still provided only through telehealth
 - For the first three weeks of the semester, all courses are taught online before returning to in-person instruction; instruction continues in in-person, online, and hybrid formats as it did in Fall 2020 semester
 - March:
 - No spring break is given, to decrease travel and risk for exposure to infection
 - April:
 - MU begins offering vaccinations through its university health center
-

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Figure 1. Timeline of Midwest University’s COVID-19 Response, concl.

Fall 2021: Decreased Distancing

- August:
 - Masking policies and updated quarantining protocols remain; however, social distancing has been reduced to three feet and in-person classes resume their prepandemic sizes
 - UCC provides therapy via both in-person and telehealth formats
 - Classes are taught in online and in-person formats
- November:
 - MU introduces online platform that can provide teletherapy to out-of-state students through a third party

Spring 2022: Masking Changes

- January:
 - UCC provides only teletherapy because of rise in COVID cases
 - February:
 - UCC resumes in-person therapy options
 - March:
 - MU lifts the mask requirement, making face coverings optional on campus; self-report of COVID-19 symptoms, infection, or exposure is still encouraged; quarantine procedures follow CDC guidance
-

PRESENT STUDY

The present study sought to provide insight into the student mental health at each stage of the various institutional policies that were put in place at MU in response to COVID-19. The semesters under investigation were Fall 2019–Spring 2022. Our study was guided by two research questions:

1. How have depression scores changed across semesters from prior to the pandemic to the present?
2. Do difficulties in emotion regulation account for any potential differences in depression across semesters?

Before moving forward, it is worth mentioning the time in which survey data were gathered for the present study. The academic semesters under investigation in this study were Fall 2019, Spring 2020, Fall 2020, Spring 2021, Fall 2021, and Spring 2022. Data collection began in Fall 2019, prior to the onset of the pandemic, as part of a larger study on childhood adversity and adult mental health. All students who completed the study in Spring 2020 did so after the university had closed campus and transitioned to virtual education because of statewide lockdown as cases of COVID-19 became more prevalent. Data collection during Fall 2020, Spring 2021, and Fall 2021 was conducted during times when there were social-distancing guidelines, masking requirements at the university, and

quarantining protocols. Finally, in Spring 2022, all students who completed this study did so after the masking requirement had been lifted. We thus have a glimpse of MU student mental health before the pandemic, shortly after the pandemic's onset, throughout the pandemic's course, and when institutional policies once again closely resembled prepandemic functioning.

METHOD

Participants

A total of 899 participants were recruited for the current study. The participants were recruited from an undergraduate research pool comprising primarily Introduction to Psychology students from several sections taught by multiple instructors. Participants took part in the research for course credit. Informed consent and all instruments were completed online via Qualtrics. The sample was 71.60% female ($n = 644$) and 28.30% male ($n = 254$), with data on gender identity missing for 1 participant.¹ Age of participants ranged from 18 to 37 years ($M = 19.27$, $SD = 1.73$). The number of participants completing the study each semester was comparable, with 134 participants in Fall 2019, 159 in Spring 2020, 143 in Fall 2020, 136 in Spring 2021, 190 in Fall 2021, and 137 in Spring 2022. Most students were freshmen ($n = 543$), followed by sophomores ($n = 277$), juniors ($n = 48$), seniors ($n = 19$), and 1 graduate student, with class data missing for 11 participants. Participants identified as White, non-Hispanic ($n = 793$); Black, non-Hispanic ($n = 38$); multiracial ($n = 27$); Asian ($n = 25$); Hispanic ($n = 9$); and Pacific Islander ($n = 2$), with racial/ethnic identity data missing for 5 students. Regarding locale, 86.50% of participants indicated that they were in-state students ($n = 778$) and 11.80% indicated that they were out-of-state students ($n = 106$), with residency data missing for 15 students; 40.93% of students reported living on campus ($n = 368$), and 58.84% participants reported living off campus ($n = 529$), with campus residence data missing for 2 participants. Finally, 523 students were not first-generation students, while 375 were first-generation college students (data on first-generation status was missing for 1 student). Table 1 summarizes participants' demographic data.

Materials

Difficulties in Emotion Regulation Scale. The Difficulties in Emotion Regulation Scale (DERS) is a 36-item self-report measure that assesses clinically relevant difficulties in emotion regulation (Gratz and Roemer 2004). Sample items include “When I am upset, I have difficulty focusing on other things” and “I am attentive to my feelings.” Participants respond to items on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). Items are summed to provide a total DERS score, with higher scores indicating greater difficulties in regulating emotions. The DERS has demonstrated high test-retest reliability for a period of four to eight weeks ($\rho_1 = .88$) as well as construct and predictive validity (Gratz and Roemer 2004).

Table 1. Demographic Data by Semester

Variable	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spring 2022
Gender (<i>n</i>)						
Male	49	39	28	38	59	41
Female	84	120	115	98	131	96
Data missing	1	—	—	—	—	—
Academic class (<i>n</i>)						
Freshman	75	77	80	84	131	96
Sophomore	48	63	38	45	51	32
Junior	5	14	11	4	7	7
Senior	4	5	4	3	1	2
Graduate student	1	0	0	0	0	0
Data missing	1	—	10	—	—	—
First-generation status (<i>n</i>)						
First-gen student	65	75	59	53	63	60
Not first-gen student	69	84	83	83	127	77
Data missing	—	—	1	—	—	—
Race/Ethnicity (<i>n</i>)						
White, non-Hispanic	117	137	132	113	170	124
Black, non-Hispanic	7	10	3	7	6	5
Asian	3	1	3	7	8	3
Hispanic	1	1	2	2	3	0
Pacific Islander	0	0	0	1	0	1
Multiracial	4	10	3	5	2	3
Data missing	2	—	—	1	1	1
Permanent residence (<i>n</i>)						
In state	119	141	119	119	162	118
Out of state	10	17	16	17	28	18
Data missing	5	1	8	—	—	1
Campus residence (<i>n</i>)						
On campus	62	69	71	0	113	53
Off campus	71	90	71	136	77	84
Data missing	1	—	1	—	—	—
Total	134	159	143	136	190	137

Patient Health Questionnaire. The Patient Health Questionnaire is a 9-item measure (PHQ-9) that is widely used by health professionals to assess depression severity (Kroenke, Spitzer, and Williams 2001). The PHQ-9 consists of statements regarding symptoms of depression (e.g., “Little interest or pleasure in doing things,” “Feeling down, depressed, or hopeless”) for which respondents indicate how often they have experienced the specified symptoms over the past two weeks, on a four-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Responses to items are summed; thus, the higher the score, the greater

level of depression someone is experiencing. Total scores of 5, 10, 15, and 20 serve as cut points for mild, moderate, moderately severe, and severe depression (Kroenke et al. 2001). The test-retest reliability of the PHQ-9 over a 48-hour period was high ($r = 0.84$), and the PHQ-9 has demonstrated strong construct and criterion validity (Kroenke et al. 2001).

Data Analysis

The primary analysis for the current study was an analysis of covariance (ANCOVA). The ANCOVA included semester as the independent variable, PHQ-9 as the dependent variable, and DERS and gender identity as the covariates. The ANCOVA was conducted to control for the effect of difficulties in emotion regulation and gender identity on depression, in order to determine if depression scores were meaningfully different between semesters, regardless of students' ability to regulate emotion or their gender identity. Similar to previous research, a Pearson correlation analysis revealed a significant positive correlation between difficulties in emotion regulation and depression, $r(872) = .60, p < .001$, further supporting our decision to control for emotion regulation in the ANCOVA. Moreover, we wanted to also control for gender because of the large percentage of our sample that identified as female (71.70%) and the trend for female college students to indicate higher rates of depression than their male counterparts (ACHA 2021a).

Prior to conducting our ANCOVA, we tested for the assumptions of an ANCOVA (e.g., normality, homoscedasticity, etc.). All assumptions were met with some slight exceptions. When examining for outliers, we found four outliers, but they had no meaningful impact on the results when we ran our ANCOVA with and without outliers, so we chose to include outliers in our analysis. Using a Shapiro–Wilk test, we found a minor violation in the assumption of normality regarding depression, for Fall 2021, $W = 0.98, p = .031$; however, an ANCOVA is generally robust to violations of normality, particularly when the ANCOVA groups are equal or nearly equal (Rheinheimer and Penfield 2001). We thus continued with our analysis without transformations of our data because our groups were comparable in size and we felt our ANCOVA would be robust to this violation of normality. Finally, to test for homoscedasticity, we tested the interactions of semester \times emotion regulation, semester \times gender, and semester \times gender \times emotion regulation. There were no significant interactions between the covariates and semester: semester \times emotion regulation, $F(5, 847) = 0.62, p = .683$, semester \times gender, $F(5, 847) = 0.82, p = .534$, and semester \times emotion regulation \times gender, $F(6, 847) = 0.83, p = .546$. It therefore appeared that no differences in depression existed between semesters because of gender and/or emotion-regulation abilities. Finally, for our ANCOVA, we utilized η^2 as a measure of effect size. Using Cohen's (1988, as cited in Fritz, Morris, and Richler 2012) guidelines, effect sizes were determined to be either large (.14), medium (.06), or small (.01) depending on the value of η^2 .

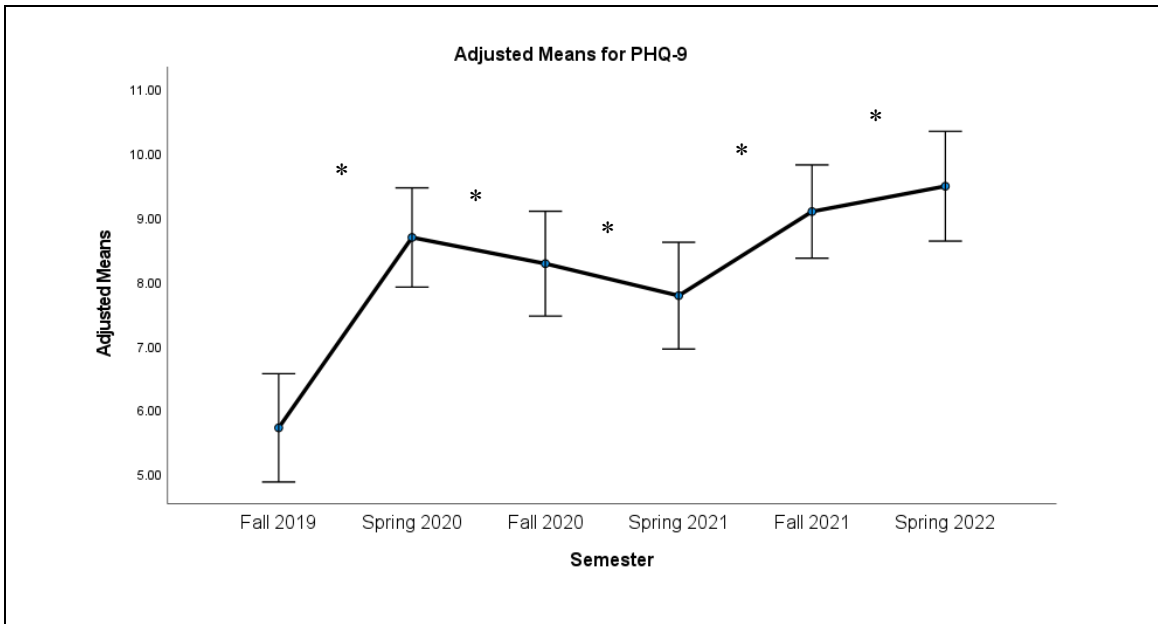
RESULTS

First, we examined the descriptive statistics of two of our main variables of interest; depression and emotion regulation. Means and standard deviations for depression and

difficulties in emotion regulation, broken down by gender and semester, can be found in Table 2. Next, we examined the results of our primary analysis, the ANCOVA. The ANCOVA demonstrated a significant effect of semester on depression, $F(5, 863) = 10.06, p < .001$, with a medium effect size ($\eta^2 = .06$). Pairwise comparisons using the Bonferroni correction were conducted, and as such, adjusted means are presented unless otherwise stated. Post hoc tests revealed that depression scores in Fall 2019 ($M = 5.71, SE = 0.43$) were significantly lower than in Spring 2020 ($M = 8.68, SE = 0.40$), $p < .001$, Fall 2020 ($M = 8.27, SE = 0.42$), $p < .001$, Spring 2021 ($M = 7.77, SE = 0.42$), $p = .01$, Fall 2021 ($M = 9.08, SE = 0.37$), $p < .001$, and Spring 2022 ($M = 9.48, SE = 0.44$), $p < .001$. These results appear to indicate that depression rates have been significantly higher throughout the pandemic than they were prior to the pandemic (i.e., Fall 2019), when controlling for gender identity and emotion regulation abilities. A graphical representation of the ANCOVA results is provided in Figure 2. A post hoc power analysis was conducted in G*Power (University of Düsseldorf 2022), which indicated that the ANCOVA had sufficient power, with $1 - \beta = 0.999$. Thus, based on the p -values of our ANCOVA and the power observed, we believe the results are adequately protected against Type I and II errors.

Table 2. Means and Standard Deviations of PHQ-9 and DERS by Semester and Gender

Semester	PHQ-9		DERS	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Fall 2019				
Male	4.47	4.93	93.29	17.09
Female	7.25	5.97	99.79	15.75
Spring 2020				
Male	6.85	6.90	85.44	23.70
Female	8.59	5.87	91.63	26.50
Fall 2020				
Male	6.18	5.88	84.54	23.71
Female	9.04	6.22	96.49	23.73
Spring 2021				
Male	6.65	5.50	93.16	20.41
Female	8.37	6.01	94.35	22.77
Fall 2021				
Male	6.00	5.89	81.36	21.51
Female	10.02	6.92	95.10	21.76
Spring 2022				
Male	7.55	6.11	92.37	17.24
Female	10.58	6.52	97.50	21.99
Total				
Male	6.20	5.89	88.21	20.96
Female	9.05	6.35	95.55	22.66

Figure 2. Adjusted Means of Depression Scores by Semester

Note: Adjusted means are representative of an ANCOVA with semester as the independent variable and depression as the dependent variable while controlling for difficulties in emotion regulation and gender identity. Error bars represent 95% confidence interval.

* Significantly greater than Fall 2019.

DISCUSSION

The results of the current study demonstrate that depression scores for students were significantly higher during the semesters following the onset of the COVID-19 pandemic and the subsequent implementation of various social distancing policies. Specifically, we conducted an ANCOVA in which we controlled for difficulties in emotion regulation and gender identity and found that depression was significantly higher each semester during the pandemic than in Fall 2019, prior to the pandemic; thus, depression appears to have significantly increased at MU after the onset of the pandemic, regardless of individuals' gender identity or ability to regulate their emotions. Furthermore, depression scores have sustained this increase throughout the pandemic and do not appear to be decreasing despite a loosening of restrictions at MU.

It is interesting that there were no significant differences between depression scores in the semesters following the pandemic's onset in Spring 2020 (i.e., depression remained elevated and did not significantly improve after returning to campus). This may have occurred for a variety of reasons. First, students were dealing with a changing academic environment that they had to adapt to regularly (e.g., being fully online one semester; then taking a mix of hybrid, in-person, and online courses in two semesters; then returning to primarily in-person, socially distanced classes with some online courses in Fall 2021; then moving to not having to wear masks in Spring 2022). This continual adjustment and

adaptation may have added stress for students because of a lack of consistency and routine in their academic environment. Such adjustment to stressors is often associated with anxiety and depression symptoms (e.g., American Psychiatric Association 2013) and may have contributed to depression scores remaining elevated. Second, students may have felt a sense of hope that a vaccine would be a “silver bullet” to COVID-19 that would lead to campus returning to prepandemic functioning, but, as was realized, despite dissemination of COVID-19 vaccines beginning in Spring 2021, many restrictions and safeguards had to be maintained to slow the continued spread of the disease, which may have been discouraging for some individuals. Finally, depression has been showing increased prevalence among the college student population for the past several years (ACHA 2021a, 2021b, 2022); thus, it is possible that depression scores not significantly lowering after Spring 2020 may be due to a continuation of depression trends that have been observed for years in college students (i.e., depression continually increasing in prevalence despite increased mental health awareness and resources). For further reading on factors that have been attributed to the rise in prevalence of depression in college students, see Antshel (2020).

Given that there has been an increase in prevalence of depression in college students prior to the pandemic, it is worth reiterating that the only primary significant differences that we observed in our study occurred *after* COVID-19 and social-distancing policies began to play a prominent role in students’ lives. Depression was significantly lower in Fall 2019 than in all other semesters. Again, these differences were observed after the most overt change to students’ lives between semesters: the onset of COVID-19 and implementation of social distancing policies. More subtle changes (e.g., going from online-only to hybrid classes) did not result in significant changes in depression. It is therefore possible that COVID-19 and institutional restrictions in the Spring 2020 semester exacerbated the stressors that are often thought to already contribute college student depression (e.g., social media, emphasis on performance outcomes; Antshel 2020) and then depression remained elevated in the following semesters because of the continually changing academic environment, coupled with the aforementioned traditional stressors.

Limitations

The current study is not without limitations, providing opportunities for future research. First, the data presented are cross-sectional and thus may be influenced by cohort effects. Longitudinal designs may be beneficial in demonstrating how the same group of students progressed throughout the pandemic. Second, we were able to take only two measures of mental health. A more comprehensive assessment of student mental health over the course of the pandemic may provide a fuller picture of how students have responded to the environment. For example, anxiety is generally cited as the top college-student mental health concern currently (e.g., ACHA 2022) and is often comorbid with depression (Watson and Stasik 2014) but was not able to be included in this study. Additionally, it is possible that individuals may be languishing in some aspects of their mental health while flourishing in others (Keyes 2007). Including measures of both psychopathology and psychological well-being may thus illustrate college students’ total mental health. Third, the data included in this report were collected from one university in the midwestern United

States, primarily from freshmen and sophomores, as well as primarily White students. These demographic variables are important, as COVID-19 affected various groups differently. For example, research suggests that the pandemic has affected some racial groups differently than others (McKnight-Eily et al. 2021). While this is obviously an important consideration, we did not have enough participants of varying racial/ethnic groups and academic classes to responsibly run comparative analyses between groups with our data. Research examining mental health of college students at several universities, in separate contexts (e.g., rural, urban), and from diverse gender identity, racial, sociocultural, and academic class backgrounds could improve generalizability.

Implications

Despite its limitations, we believe this study has valuable implications for researchers, clinicians, faculty, and administration in higher education. A brief investigation of the Integrated Postsecondary Education System (NCES n.d.) indicates that approximately 153 institutions are comparable to MU (i.e., four-year public university that is a non-historically Black college or university and having 5,000–9,999 students) in the United States. Thus, MU is similar to many universities across the country and it is important that researchers stay vigilant in documenting the mental health of students as vaccinations circulate and restrictions lift.

Two interesting findings in the current study stand out. First, even after differences in emotion regulation were controlled for, the COVID-19 pandemic and subsequent restrictions appear to have had a profoundly negative impact on student mental health. In our sample, a positive correlation was observed between difficulties in emotion regulation and depression, which contributed to our decision to control for difficulties in emotion regulation in our ANCOVA. Whenever difficulties in emotion regulation and gender were controlled for, results indicated significantly less depression in Fall 2019 than in the remaining semesters. Studies taking place during the pandemic and examining what may be moderating the relationship between emotion regulation and depression may be valuable in providing recommendations to help individuals improve their emotion-regulation abilities and, thus, decrease the likelihood of depression.

Second, the negative impact of COVID-19 and social restrictions at MU seems to have had a lasting effect. Our ANCOVA revealed that depression has been significantly higher than its prepandemic levels each semester following the onset of the pandemic. It is interesting that depression has remained elevated after Spring 2020, considering that from Fall 2020 through Spring 2022, students have been returning to class, living on campus again, and participating in clubs, sports, and other extracurricular activities; vaccinations have been disseminated; and counseling services have been expanded. In higher education's effort to improve student mental health, it is important to continue investigating what may be unique about the current sociocultural landscape that is negatively affecting student mental health. Such investigation may help in developing appropriate prevention and intervention programs for colleges and universities. For example, Campos et al. (2022) found problem-focused coping strategies to be protective factors to psychological distress during COVID-19 among a large sample of Brazilian adults. Similar studies in U.S.

universities may benefit clinicians in developing interventions for college students. In the meantime, universities like MU that have increased the amount of mental health services they offer and the modality in which they do so should be encouraged to continue this practice, as there is an apparent need. Research supports such practices, demonstrating that teletherapy can be just as effective as face-to-face therapy for many mental health disorders (Greenbaum 2020) and that social support such as that offered at MU has been found to alleviate depression (Comer and Comer 2019), particularly for female-identifying students (Nolen-Hoeksema 2012).

CONCLUSION

The current study examined depression at one university in the U.S. Midwest from the Fall 2019 semester through the Spring 2022 semester. When difficulties in emotion regulation and gender identity were controlled for, depression scores were significantly higher each semester after the onset of the pandemic than before it. Continued monitoring of student mental health trends as well as of the mechanisms underlying them may be valuable in prevention and intervention efforts as higher education returns to traditional functioning.

ENDNOTE

1. Data on demographic variables were gathered through institutional data. MU collects data pertaining to gender identity on a binary basis; thus, gender identity in this report does not capture students who may identify as transgender, nonbinary, etc.

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