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Abstract: Student psychopathology has been a topic of increasing concern globally in recent years. During the COVID-19 pandemic, students' lives were heavily disrupted due to the change to remote learning. Now that learning is returning to normal, the turbulent changes students have experienced over the past few years may have impacted their mental health. The purpose of this study was to investigate COVID-19-related anxiety and stress levels in students shortly after the resumption of on-campus classes at a private university in Saudi Arabia. A questionnaire-based cross-sectional survey design was used. Three hundred twenty-six participants were a part of the study. Results indicated that a significant number of students reported being occupied with worry and stress related to COVID-19 and that it negatively affected their comfort while on-campus, in their classroom participation, in their social interactions and in their overall university experience. The findings from this study may be valuable to higher education institutions, academic administrators, lecturers and students themselves in helping to minimize friction during the process of students' return to campus.

Keywords: post-lockdown; classroom anxiety; COVID-19; higher education; social anxiety



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# 1. Introduction

The topic of students' mental health has been an issue of increasing concern globally. There have been many recent studies conducted on student psychopathology, especially anxiety and stress, a large portion of which have shown that the prevalence of mental health disorders is higher amongst university students as compared to similarly aged populations who do not attend university [1–3]. In one study, Zeng et al. [4] found that approximately 50% of the sample of students exhibited at least mild symptoms of anxiety, depression and stress. A similar figure was observed in Tyson et al. [5], where 60% of undergraduate students displayed "elevated levels" of anxiety. Furthermore, Meng et al. [6] reported that one in three students displayed one or more symptoms of social anxiety. The level of anxiety that students experience tends to fluctuate throughout their time at university [7]. Andrews and Wilding [8] reported that halfway through the students' degrees, almost 30% who had previously been symptom-free developed anxiety or depression. Moreover, the psychological well-being of students tends to decrease over the course of their degrees [7]. Chan and Sun [9] added to this notion and argued that the length of the degree has been shown to have an effect on psychological well-being and that the longer the duration of the program, the higher the levels of anxiety, depression, stress, irrational beliefs and emotional problems in students.

There have been many studies linking anxiety with certain lifestyle factors [4–6,10,11]. One of the most prominent correlations is between anxiety and physical inactivity. Studies have shown that students who do not regularly exercise and lead sedentary lifestyles are more likely to suffer from anxiety and other mental health issues [4,5,10,11]. Additionally, students who have poor self-image of their physical and mental health have a higher prevalence of anxiety [4]. High screen times also correlate with an increased risk of psychological issues [4,11].

In addition to lifestyle, there are several other factors to consider. Manassis [12] states that students with learning disabilities tend to exhibit symptoms of anxiety in academic

settings and that the two frequently co-occur. Meng et al. [6] found that there is a link between troubling experiences during childhood and social anxiety later in life. A few studies indicated that students who are religious are less likely to have anxiety [4] and irrational beliefs [9]. Chan and Sun [9] also found that low family income is a significant factor contributing to having irrational thoughts that may lead to stress and anxiety. Zeng et al. [4] state it is probable that the root of anxiety in students is a result of a combination of these issues, in addition to the adjustments that students must go through when attending university.

In addition to the above-mentioned sources of anxiety, the COVID-19 pandemic has been identified as a leading source of anxiety and stress among students [13–15]. Anxiety during the lockdown period caused by the COVID-19 pandemic not only affected students' physical and psychological health but their academic careers and their families as well [16–20]. Moreover, anxiety and stress are not just limited to the lockdown period of the pandemic but extend to the post-lockdown period as well. Many studies have been conducted to evaluate the effect of COVID-19-related anxiety and stress among students during post-lockdown on-campus classes. Haucke et al. [21] carried out a study to determine if mental health issues caused by COVID-19 remain after lockdown and found that, while being exposed to information regarding COVID-19 did not have a significantly negative effect on the moods of the participants, there was an increase in negative mental health due to worrying about contracting the virus as well as the uncertainty of being able to restore social interactions after lockdown. Furthermore, the results of their study concluded that, despite the ceasing of the lockdown, the coronavirus is still a contributing factor to people's mental health.

In a similar study, Zhuo et al. [22] studied how the return to university after the lockdown affected students' mental health. The findings of their study indicated the ending of the lockdown did not ease students' fear and uncertainty of the coronavirus. Students who feared the return of the virus were found to be more anxious than those who did not. Research conducted by Tadese et al. [23] to explore students' perceptions of post-lockdown classes as well as its dangers to their physical and mental well-being also proves similar results. Another study carried out by Kharma et al. [24] in Saudi Arabia revealed that 85% of the respondents suffered from stress and anxiety as they returned to college. The respondents reported feeling intense fear, which resulted from their fear of the possibility of the college failing to follow COVID-19 protocols issued by the WHO (World Health Organization) and the fear of being exposed and surrounded by people outside after thelockdown.

The above-mentioned studies show that the uncertainty of students' health in returning to college adds to the anxiety and stress that students from which students suffer. Therefore, students' deterioration in mental health transcends the lockdown period and post-lockdown education negatively impacting the mental well-being of university students. The present study focuses on exploring the level of anxiety among undergraduate students at a private university during post-lockdown on-campus classes. Hence, the study explores the following research questions.

1. What was the level of classroom anxiety among undergraduate students after returning to post-lockdown on-campus classes?

2. What was the level of social anxiety among undergraduate students after returning to post-lockdown on-campus classes?

3. What was undergraduate students' level of satisfaction for COVID-19-related protocols during post-lockdown on-campus classes?

#### 2. Methodology

The present study aimed to explore the level of anxiety among students due to the return to on-campus class during the COVID-19 pandemic. The population of the study was undergraduate male and female students at a private university in Riyadh, Saudi Arabia. The sample size was 326 both male and female students with a mean age of

18–21 years and 1.24 standard deviation. As it has been established by many researchers, anxiety in students could be a result of many factors at play, such as financial [25,26], academic [27], lifestyle-related [5,11,28], etc. Hence it was necessary to construct a demographic profile of the participants so that any dominant factor adding to COVID-19-related anxiety could be identified. The following Table 1 reveals the demographic profile of the participants.

Variables		Frequency	Percentage	
Gender	Male	102	31.29%	
Gender	Female	224	68.71%	
	18–21	256	78.53%	
Age	22–25	63	19.33%	
Ū.	26–30	7	2.15%	
	Preparatory Year	62	19.02%	
	1st Year	109	33.44%	
Year of studies	2nd Year	76	23.31%	
	3rd Year	43	13.19%	
	4th Year	36	11.04%	
	Business Administration	82	25.15%	
	Law	77	23.62%	
Study Major	Humanities and Sciences	20	6.13%	
	Computer and Information Sciences	97	29.75%	
	Engineering	50	15.34%	

**Table 1.** Demographic profile of the participants.

A questionnaire-based cross-sectional survey design was used for this study. Due to the uniqueness of the study and non-availability of any prior instrument, a questionnaire consisting of 41 items was constructed and piloted after getting feedback from two experts. Necessary changes were made in the questionnaire. The internal reliability of the questionnaire was determined by the 83 value of Cronbach's Alpha.

The questionnaire was divided into five sections. The first section sought demographic information consisting of variables such as gender, age, status, major, etc. (see Table 1). The second section consisted of seven items focused on the level of anxiety experienced by the students during post-lockdown face-to-face classes. This section did not ask questions specifically about the classroom anxiety; it only focused on anxiety due to coming back to college, such as, I feel nervous, anxious and on edge every day when I come to college. However, the third section was specifically focused on classroom anxiety. As students had spent a considerable time in lockdown where they were restricted to stay at home and had limited opportunities to have face-to-face interactions with their friends and family, it was deemed necessary to explore if students felt any sort of social anxiety due to being in a face-to-face educational environment. Hence, items in the fourth section focused on social interaction skills, such as I have difficulty making eye contact with other people. Both section three and four consisted of eleven items each. The last section was focused on students' satisfaction level over COVID-19-related precautionary measures being implemented at college. The average time to complete the survey was approximately 6 min. A four-point Likert scale was used as the response scale for Sections 2–5.

A convenient sampling technique was used to collect the responses of students. A questionnaire was distributed online through university announcements. The questionnaire contained a cover sheet explaining the nature of the study and assured students of their anonymity if they decided to volunteer for the study. Hence, informed consent was obtained. The responses were collected during October 2021–December 2021. A total of 326 complete questionnaires were received, consisting of 224 female and 102 male responses.

To analyze the data, descriptive statistical analysis was performed using SPSS software. To provide a clearer view of the results, the four-point Likert scale was divided into two sections, and the points within each section were combined. Thus, *strongly agree* was combined with *agree* and *strongly disagree* with *disagree*.

#### 3. Results

# 3.1. Anxiety While On-Campus

The results of the present study showed that a notable percentage of students experienced anxiety related to COVID-19 while on-campus at university (see Table 2). A considerable number of students worried that, after being at college, they might bring the virus back to their families (57%). A high proportion of students (55%) reported not being able to relax while at college, and 35% agreed that they experienced trouble sleeping due to the anxiety surrounding coming into college. Additionally, 35% of students reported feeling nervous and anxious at college, and the same percentage felt that they remained anxious even after returning home from campus. Moreover, one-third of the sample reported not being able to control their worry of getting COVID-19 while at college, and 39% felt more irritable since the resumption of on-campus classes.

 Table 2. Anxiety while being on-campus.

	Agre ∑	e %	Disag ∑	gree %	Standard Deviation Ø	Mean ±
I feel nervous, anxious and on edge every day when I come to college.	113	35%	213	65%	2.76	0.92
I have trouble sleeping because I am anxious about going to college.	115	35%	211	65%	2.79	0.95
I cannot stop or control my worry of getting COVID-19 while being at college.	106	33%	220	67%	2.89	0.92
I often have trouble relaxing while at college.	179	55%	147	45%	2.42	0.9
I become easily annoyed or irritated since the start of on-campus classes.	127	39%	199	61%	2.68	0.9
I remain feeling anxious after I come back from college.	113	35%	213	65%	2.79	0.89
I feel worried that I may bring COVID-19 back to my home and family members after spending a day at college.	185	57%	141	43%	2.4	1.02

When the data according to gender were analyzed, the results indicated no major differences between male and female students in this part of the study. Furthermore, analysis of the data according to the five different colleges in the university revealed that the number of students who felt they could not control their worry of getting COVID-19 while at college was 13% percent lower in the College of Humanities and Sciences than the average. They also reported feeling less irritated since the resumption of face-to-face classes (12% less than the average), less anxious after leaving college (almost 10% less) and less worried about bringing COVID-19 back home to family members (17% less).

# 3.2. Classroom-Related Anxiety

The results for classroom-related anxiety (Table 3) showed that the majority of students did not avoid going to class (84%) or their lecturers' office hours (82%) due to fear of contracting coronavirus. However, a large portion of students worry that they may be forced to miss lectures (62%) or exams (60%) if they do contract COVID-19, and 29% reported feeling afraid of group work due to the risk of catching the virus. Close to one-quarter of the surveyed students reported that worry of COVID-19 has affected their class participation, caused them to experience breathing difficulties and made them feel the need to leave class if it is overcrowded. A smaller percentage of students said they experience restlessness (23%); almost one-third felt that concern surrounding the virus has negatively

impacted their grades; and 61% felt uncomfortable touching desks, seats, computers and test papers during exams.

Table 3. Classroom-related anxiety.

	Agre ∑	e %	Disaş ∑	gree %	Standard Deviation Ø	${\displaystyle \underset{\pm}{Mean}}$
Due to the fear of contracting COVID-19, I often miss my classes on purpose.	74	16%	274	84%	3.25	0.83
I often feel afraid of studying in a group due to the possibility of contracting COVID-19.	94	29%	232	71%	2.93	0.91
I worry that I may miss my course lectures due to being absent after contracting COVID-19.	126	62%	125	38%	2.31	1.01
My fear for COVID-19 has affected my participation in class activities.	79	24%	247	76%	3.03	0.87
Due to my constant worry about COVID-19, I often feel so restless that I have trouble sitting still.	74	23%	252	77%	3.07	0.85
I experience difficulty breathing while in class due to my fear of contracting COVID-19.	81	25%	245	75%	3.03	0.92
Due to the fear of contracting COVID-19, I often leave class when it is overcrowded.	79	24%	247	76%	3.03	0.90
I avoid going to my teacher's office during office hours due to the fear of contracting COVID-19.	59	18%	267	82%	3.16	0.85
I worry that I may miss my tests or exams due to being in contact with a coronavirus positive person.	197	60%	129	40%	2.26	1.09
I feel uncomfortable while touching chairs, tables, computers and exam papers during exams.	198	61%	128	39%	2.31	1.04
I believe that my constant worry of contracting COVID-19 has negatively affected my grades.	102	31%	224	69%	2.84	0.96

Regarding the differences between male and female students, the results showed that approximately double the number of male students (25%) than female students (12%) reported purposefully missing classes due to fear of COVID-19. Male students were also 11% more likely to report beliefs that their grades have been negatively affected by their worry of the virus. On the other hand, over 11% more female students had worries about missing lectures; 10% more than male students feared missing exams if they caught the virus; and 15% were more likely to report feeling uncomfortable touching computers, test papers and furniture during exams.

There were a few observable differences within the university colleges. Firstly, the proportion of students who believed that their worry of the virus has had a negative effect on their grades was over 10% higher in the College of Business Administration. Additionally, the percentage of students who felt uncomfortable using university equipment and furniture was almost 13% lower in the College of Engineering. In the College of Computer and Information Sciences, almost 10% more students than the average worried about missing lectures due to COVID-19. In the College of Law, almost 9% less students reported leaving class if it is overcrowded. Students in the College of Humanities reported between 10–26% less COVID-19 anxiety when compared to the university average in 8 out of the 11 survey questions in this section of the study.

# 3.3. Social Anxiety Due to Lockdown and COVID-19

Due to limited social interaction during lockdown, students' social skills and social anxiety may have been affected when on-campus classes resumed. The results of this part

of the present study (Table 4) indicated that a large portion of students was socially anxious when returning to university. Almost 43% reported feeling nervous when speaking to their lecturer or bumping into someone they know in public, and a little over 40% said they feel tense when talking to classmates. Additionally, 39% of students reported experiencing difficulty making eye contact with others; 47% felt uncomfortable going to social events at university; and more than one-half worry about being perceived as awkward. Almost one-quarter said they avoid university cafes due to worries about COVID-19; 29% reported they feel their fear of the virus has affected their relationships with college friends; and 38% avoid disagreeing with others as it makes them uncomfortable. Lastly, almost one out of two students said they do not find it easy to make new friends, and 44% do not feel confident when meeting new people.

	Agre ∑	ee %	Disag ∑	gree %	Standard Deviation Ø	$\frac{\textbf{Mean}}{\pm}$
I get nervous when I have to speak to my teacher.	139	43%	187	57%	2.63	0.94
I have difficulty making eye contact with other people.	126	39%	200	61%	2.74	0.96
I become tense if I have to talk to my class fellows.	132	40%	194	60%	2.68	0.90
I find it easy to make friends.	159	49%	167	51%	2.68	0.9
I tense up when I bump into someone I know in public.	139	43%	187	57%	2.63	0.82
I feel uncomfortable when I go to social events in college.	153	47%	173	53%	2.57	0.93
I feel confident and comfortable when meeting new people.	184	56%	142	44%	2.43	0.86
I worry that people think I am awkward.	169	52%	157	48%	2.48	1.02
I avoid disagreeing with people because it makes me uncomfortable.	124	38%	202	62%	2.7	0.88
My fear of COVID-19 has affected my relationship with my friends at college.	93	29%	233	71%	2.95	0.94
Due to my fear of COVID-19, I avoid going to university cafes.	79	24%	247	76%	3.05	0.94

Table 4. Social anxiety due to lockdown and COVID-19.

There were a number of significant differences between men and women in this section. Across all but three of the items, female students consistently reported higher levels of socially anxious feelings and behaviors than male students. The greatest of these differences was that 33% more female students than male students worried about being perceived as awkward, and 22% more reported having trouble making eye contact with others.

There were a few significant differences across the different colleges within the university. In comparison to the university average, the percentage of students who felt uncomfortable going to social events at college was almost 14% higher in the College of Humanities, and around 22% more students within this college reported not feeling confident when they meet new people. Additionally, students in the College of Computer and Information Sciences were 10% more likely to avoid disagreeing with others, and students in the College of Business Administration were approximately 10% more likely to avoid going to college cafes.

#### 3.4. Satisfaction with COVID-19 Protocols at College

When asked about the level of satisfaction regarding COVID-19 protocols at the university, the results showed an almost 50–50 split across the survey items (Table 5). Fifty-three percent of students reported dissatisfaction with the social distancing, and 49% did not feel satisfied with the level of sanitization. Additionally, 51% of the students were not satisfied with the available alternative options for missing classes due to coronavirus, and 41% said they would prefer online lectures instead of in-person classes.

	Agree Σ	e %	Disag ∑	ree %	Standard Deviation Ø	Mean ±
I am not satisfied with the social distancing at my college.	172	53%	154	47%	2.44	0.95
I am not satisfied with the level of sanitization at my college.	160	49%	166	51%	2.48	0.95
I am not satisfied with the alternatives provided by my college for missing classes due to coronavirus.	167	51%	159	49%	2.41	0.96
I would like to have online classes instead of on-campus classes.	135	41%	191	59%	2.67	1.15

Table 5. Satisfaction with COVID-19 protocols at college.

There was only one significant gender difference in this section of the survey where 14% more female students were dissatisfied with the level of sanitization at college than male students. When looking at the results according to the different colleges at the university, the only significant differences were found in the College of Humanities. They reported 13% more satisfaction with social distancing measures than the university average, and they were 16% more satisfied with alternatives provided by the university for missed classes due to COVID-19.

The results of the present study revealed that anxiety relating to COVID-19 affects a large number of students at the university. As the results demonstrated, this could be due to students' dissatisfaction with COVID-19 precautionary measures at college, such as social distancing and sanitization, or due to the general atmosphere post-lockdown. A high proportion of students reported experiencing worry and stress about COVID-19, and the results showed that this has affected a significant number of students' classroom activity, although it is not the majority. On the other hand, many students' social skills seem to have been negatively affected by the pandemic, and the results revealed that this was a bigger issue for female students than for male students. Lastly, students in the College of Humanities tended to experience less COVID-19 anxiety and were more satisfied with precautionary measures than in other colleges. However, they experienced higher levels of social anxiety.

# 4. Discussion

The findings of this study showed that a significant proportion of students experienced anxiety regarding COVID-19 upon returning to campus post-lockdown. While most studies concerning COVID-19 anxiety in college students have been focused on the period during lockdown, this study looked at it from the post-lockdown perspective upon the resumption of on-campus classes. As of yet, few studies have been published on the mental health implications of the pandemic on college students after classes returned to normal. For context, at the time of the survey, students were instructed to continue wearing masks, sanitizing their hands and social distancing, but these measures were not being strictly enforced as the number of cases in Saudi Arabia was low. Our study concluded that a significant percentage of students experienced anxiety relating to COVID-19 after returning to campus, although this was not the majority.

The first part of the survey looked at the general COVID-19 anxiety that students faced while on campus. Many studies have identified COVID-19 as a source of anxiety in university students during the pandemic [29–31], which correlates with the findings of the present study. The most significant stressor in this section was the fear of transmission to the students' families (57%). Moore et al. [29] and Salman et al. [20] noted similar findings in fear of family contracting the virus as a considerable stressor for students. Additionally, more than one-third of the students reported trouble sleeping due to their worry, and COVID-19 anxiety has been related to poor sleep quality [30].

The second section of the survey sought information about classroom implications caused by COVID-19 anxiety. This part revealed that, while the majority of students did not miss classes or their lecturers' office hours, they were still concerned that they would

have no choice but to miss classes or exams if they caught the virus. Additionally, between one-quarter and one-third of students reported that anxiety relating to the pandemic has poorly affected their grades and classroom participation. These results are similar to the findings of Arribathi et al. [32], where almost 70% of participants felt afraid that their academic achievements would be negatively impacted due to COVID-19.

The goal of the third section was to discover whether remote learning had any effect on students' social skills or caused any social anxiety. The findings showed that a significant number of students reported experiencing various symptoms of social anxiety, the highest being the fear of being perceived as awkward. Furthermore, close to one-half of the sample reported difficulty making new friends in addition to feeling uncomfortable attending university social events. Similarly, Samantaray et al. [33] showed that social anxiety and fear of COVID-19 were positively correlated, and Thompson et al. [34] found that social anxiety symptoms had increased during the pandemic.

In the last part of the survey, findings demonstrated that approximately one-half of the sample of students was dissatisfied with sanitization levels, social distancing measures and alternatives for missed classes. More than 40% of participants said they preferred online classes—a higher percentage than what has been found in other studies [35,36].

There were a few significant differences between the results of male and female students. A few recent studies have reported that women were more likely to experience COVID-19-related emotional distress [37] and anxiety [13,15]. Some specific points in the second section of the survey correlated with these findings, including anxiety surrounding missing lectures or exams due to contracting the virus and discomfort when touching supplies or equipment on campus. On the other hand, a few points did not correlate with the studies mentioned previously, such as the fact that male students were significantly more likely to intentionally miss lectures due to their fear of COVID-19 and believed that the virus negatively impacted their grades. Although there were a few points that indicated different anxiety levels between men and women in the second section, they did not consistently point to one gender being more anxious than the other. However, the third section pointed to female students experiencing higher levels of social anxiety than the male students, which is in line with previous studies on gender differences and social anxiety prior to the pandemic [38–40]. The final section showed that female students were less satisfied with sanitization standards.

When looking at the data according to each college within the university, in a similar way to Reddy et al. [27], our study showed that students at the College of Humanities and Sciences reported lower COVID-19-related anxiety levels overall while on campus and in the classroom. This could be due to the fact that they reported higher levels of satisfaction with sanitization and alternatives for missed classes. Another reason could be that the College of Humanities has the smallest number of students as compared to the other colleges, and most of the classes do not reach full capacity. This could also explain why Humanities students were more afraid of attending social events due to fear of COVID-19 as perhaps they were used to smaller crowds.

In essence, the findings of this research study confirmed that COVID-19, past its lockdown stage, still plays a role in the levels of anxiety that college students in Saudi Arabia experience. The research findings indicated that various COVID-19-related variables contributed to the stress and anxiety that college students faced. One of the primary causes of mental discomfort in students was the fear of contracting COVID-19 and subsequently spreading it to their family members back home. The findings further demonstrated that a large number of students felt that this fear negatively affected their overall college experience and performance, including but not limited to group work, grades, class participation and socializing. While the results showed that about one-half of the students felt unsatisfied regarding proper social distancing and sanitization, this did not prevent them from attending their lectures. On the contrary, a big proportion of students feared having no choice but to miss classes as a result of contracting the virus. It can be said that, although

the COVID-19 lockdown period has come to an end, college students in Saudi Arabia are still dealing with anxiety and stress concerning the virus.

This study has successfully concluded its findings; however, there are some limitations that have hindered the study's progress. The sample included in the study was taken from one private university in Saudi Arabia only. Students from other institutions did not contribute to this study. Additionally, the survey used in this study was by no means a medical survey; what it provided was insight into the nature and causes of the stress and worry students experienced upon returning to campus after the pandemic rather than a formal medical or pathological diagnosis for anxiety. Furthermore, during the data collection process, male students could not be accessed easily to fill out the survey. Therefore, the number of female students participating in the survey is noticeably higher than the number of male students. More to mention, due to the limited time of conducting the research, students were not interviewed to give further explanation about their experience with anxiety pre-lockdown and post-lockdown. It is recommended to choose a sample that includes males and females equally and to thoroughly interview students to achieve critical and clear findings.

# 5. Recommendations and Implications

This study found that a considerable portion of university students experienced different types of stress relating to COVID-19 after on-campus learning resumed. The results of this investigation will be useful to higher education institutions, academic administrators, lecturers and students to help them gain a better understanding of students' mental health in light of the pandemic and the specific areas of concern that contributed to stress and anxiety. This information could be valuable in helping to minimize friction during the process of students returning to in-person classes. To improve student mental health, it is recommended to maintain cleanliness and hygiene standards on campus, to reduce overcrowding in lecture halls and to provide alternatives in the case of missed exams/classes. It would also be beneficial to provide social support for students suffering from social anxiety.

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