



Prevalence and Predictors of Depression, Anxiety, and Stress Symptoms among Jordanian University Students Amid COVID-19 Pandemic

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ABSTRACT

Background: The COVID-19 pandemic has led to increased rates of depression, anxiety, and stress symptoms. University students have been particularly affected by these psychological consequences due to the pandemic and its accompanying precautions. **Purpose:** This study aimed to assess the prevalence and predictors of depression, anxiety, and stress symptoms among Jordanian university students amid COVID-19 pandemic. **Methods:** This is a cross-sectional study. Data was collected through an anonymous online survey from Jordanian university students during the period from February 2022 to May 2022. The survey included a self-reported questionnaire that is composed of socio-demographic variables and the Arabic version of the Depression, Anxiety, and Stress Scale (DASS-21). **Results:** The mean total scores for depression, anxiety, and stress symptoms were 18.91, 18.04, and 20.71, respectively, indicating the presence of these psychological issues among university students during the pandemic. Psychological problems, parents being diagnosed with mental illness, living arrangements, and academic year explained 25.6% of the variation in depression symptoms. Academic year, living arrangements, specialization, GPA, and gender accounted for 25.9% of the variation in anxiety symptoms. Parents being diagnosed with mental illness, specialization, marital status, and GPA explained 22.3% of the variation in stress symptoms. **Conclusion:** The findings of this study have significant implications for healthcare practice, policy development, and community engagement. **Implications for Nursing:** Healthcare providers, including nurses, can utilize this information to develop targeted interventions tailored to address the specific mental-health needs of university students in Jordan. Policymakers can advocate for the implementation of mental-health support services within university settings, while community organizations can collaborate with educational institutions to promote mental-health awareness and provide accessible resources for students. By addressing the mental-health challenges identified in this study, stakeholders can contribute to fostering a supportive and resilient campus environment conducive to student success and well-being.

Keywords: Depression, Anxiety, Stress, COVID-19, University students, Jordan.

What does this paper add?

1. It contributes to the existing literature by providing empirical data specific to the Jordanian context,

thereby enhancing our understanding of the psychological impact of the pandemic on this particular demographic group.

2. Additionally, the study identifies potential predictors of mental-health symptoms, which can inform targeted interventions and support strategies tailored to the needs of Jordanian-university students.
3. Overall, this research provides valuable insights that can guide healthcare professionals, policymakers, and educators in developing effective initiatives to promote mental well-being and resilience among university students during times of crises.

Introduction

Mental-health issues have escalated into a pressing public-health concern, with profound implications for global populations (Vigo et al., 2016). Among these concerns, the mental well-being of students emerges as a critical issue, given its potential to significantly influence their future thoughts, emotions, and behaviors (Gutiérrez-Hernández et al., 2021). Extensive research consistently demonstrates that early-life mental-health problems can detrimentally impact academic performance, leading to potential economic repercussions (National Academies of Sciences, Engineering, and Medicine, 2021). A meta-analysis conducted in 2019, involving 30,817 Chinese medical students from ten cross-sectional studies, revealed a significant prevalence of depression, anxiety, and suicidal thoughts, with rates of 29%, 21%, and 11%, respectively (Zeng, 2019). Moreover, more recent research has highlighted elevated levels of depression, anxiety, and stress, particularly among university students (Hanawi, 2020).

The COVID-19 pandemic has brought about significant challenges to mental-health worldwide, particularly among university students who have experienced disruptions to their academic, social, and personal lives (Al-Rabiaah et al., 2020; Hanawi, 2020; Zeng, 2019). The emergence of the COVID-19 pandemic prompted researchers to investigate the prevalence of mental-health issues among undergraduate students, given their potential vulnerability to its effects. Many studies indicated a notable increase in the prevalence of depression, anxiety, and stress symptoms among university students during the COVID-19 pandemic compared to pre-pandemic levels and many students reported feeling overwhelmed, isolated, and uncertain about the future, which contributes to their mental-health struggles. (Al-Rabiaah et al., 2020; Hamaideh et al., 2022;

Hanawi, 2020; Saraswathi et al., 2020; Zeng, 2019). For instance, amidst the COVID-19 pandemic, college students experienced post-traumatic stress disorder, as well as feelings of anger, fear, sadness, nervousness, and emotional disturbances, as documented by Brooks et al. (2020) and Cao et al. (2020).

The COVID-19 pandemic exacerbated mental-health challenges, with factors like social isolation, economic uncertainty, and fear of the disease contributing to increased anxiety, depression, and stress (Kola et al., 2021). Unfortunately, many university students faced additional challenges during the pandemic, including the sudden shift to online learning, which came with its own set of stressors, such as technical issues and social isolation (Sifat, 2020). The pandemic underscored the importance of addressing the mental-health of young adults, especially university students, who are at a critical stage of life. Research has shown that academic pressures, changes in living situations, and other factors can contribute to higher rates of depression, anxiety, and stress in this population (Ramón-Arbués et al., 2020). Moreover, it was revealed that during the COVID-19 outbreak, a significant proportion of undergraduate students were struggling with psychological distress. Specifically, findings demonstrated that 35.5%, 33.2%, and 24.9% of these students exhibited symptoms indicative of depression, anxiety, and stress, respectively (Saraswathi, 2020).

In Jordan, as in many other countries, the COVID-19 pandemic led to widespread closures of educational institutions, which disrupted the lives of millions of university students. The shift to online learning brought its own challenges, including technology limitations, financial stress, and emotional strain (AlAzzam et al., 2021; Jaradat & Ajlouni, 2021). This is particularly challenging for college students who lack access to necessary facilities and internet resources to support their educational needs. Further, in 2020, the results of the study conducted by Hamaideh et al. (2022) in Jordan among university students showed a significant prevalence of psychological stressors, including depression, anxiety and stress symptoms with 71% of participants displaying them. This aligns with the findings of Cao et al. (2020), who indicated increased levels of stress and pressure among college students, increasing their susceptibility to psychological issues. In another cross-sectional survey study conducted on medical students' anxiety and depression levels, coupled

with an examination of the profound influence of the COVID-19 pandemic on the educational experience, the results revealed a notable impact across various dimensions, with 33.8% of students experiencing depression symptoms and 22.4% reporting heightened levels of anxiety (Basheti, 2021).

The significance of this study stems from the fact that it is one of the studies looking at university students' mental-health during the COVID-19 outbreak. In addition, while most studies were conducted at the beginning of the pandemic, this study was conducted in the middle and toward the end, and it will help determine whether the students' depression, anxiety, and stress symptoms have changed or remained the same. Hence, this study aimed to assess the prevalence and predictors of depression, anxiety, and stress symptoms among Jordanian university students amid COVID-19 pandemic. The findings will be valuable for policymakers, educators, and healthcare professionals, including nurses, in Jordan, providing insights into the mental-health challenges faced by university students during the pandemic and guiding the development of effective programs and awareness campaigns.

Methods

Sampling and Setting

The researchers used a cross-sectional descriptive design to collect data from a convenience sample of university students. Using G*Power 3.1.2, the researchers calculated the sample size based on a standard power level of 0.80, a conventional-significance criterion (α) of 0.05, and a medium effect size of 0.015 (Faul et al., 2007). The minimum sample size needed for this study was 335 participants.

The study was conducted at three government-run universities located in the northeastern region of Jordan: Yarmouk University in Irbid governorate, Jordan University of Science and Technology in Al Ramtha city within Irbid governorate, and Al al-Bayt University in Al-Mafraq governorate. These universities are among the largest higher-education institutions in Jordan and have established a reputation for providing high-quality education. Each of these universities offers an extensive range of faculties, encompassing fields, such as education, human-resource management, social development, communication science, nursing, hospitality, food nutrition, and many more. Collectively, these universities enroll approximately 70,000

undergraduate students, representing diverse backgrounds, regions, and cultures. Eligible participants needed to be fluent in Arabic, possess the ability to use software to complete the survey questionnaire, and have access to both social media and the internet.

Study Instruments

The study variables and instruments consist of two parts:

1. Socio-demographic Data, such as: gender, age, marital status, working status, living situation, university, specialization, academic year, GPA, family economic status, parental education levels, psychological issues and parents being diagnosed with mental illness.
2. Depression, Anxiety, and Stress Scale (DASS-21). The DASS-21 was used to evaluate and measure three negative emotional states of depression, anxiety, and stress. This tool comprises three self-report sub-scales (7 items for each) designed to assess those three variables using a four-point Likert-type scale ranging from 0-3. Before analysis, the scores of each item should be multiplied by 2. Therefore, the possible range of each sub-scale lies between 0 and 42 (Lovibond & Lovibond, 1995). Each sub-scale has its cut-off values for normal, mild, moderate, severe, and extremely severe levels (See Table 2). The Arabic version of the scale is considered accurate and reliable (Moussa et al., 2017). Reliability coefficients (Cronbach's alpha) for the sub-scales are 0.80 for anxiety, 0.78 for depression, and 0.77 for stress (Lovibond & Lovibond, 1995). The scale has demonstrated robust internal consistency and reliability in both clinical and non-clinical samples, with Cronbach's-alpha values ranging from 0.74 to 0.93 (Palaniappan et al., 2022).

Data Collection

Data collection was carried out through an anonymous online survey from a convenient sample of Jordanian-university students during the period from February 2022 to May 2022. Survey questionnaires were created using Microsoft Forms, with all items designated as mandatory. Data was securely transferred to the main researcher's e-mail upon completion. Participants were also provided with contact information with the researchers to address any queries about survey completion.

Ethical Considerations

Ethical considerations were strictly adhered to, with ethical approval obtained from Al al-Bayt University (AABU) (IRB #: 02/2021/2022). An electronic consent form accompanied the survey questionnaire, including information about the study purpose and procedures, and university students were asked to review and digitally sign it prior to completing the survey. The consent form informed the participating students that their involvement was voluntary. Additionally, students were assured that their personal information would be safeguarded through stringent privacy and confidentiality measures implemented by the research team. Upon signing the consent form, students proceeded to complete the questionnaire forms online. Personal information was omitted to protect participant identities, and data encryption was employed for added security.

Data Analysis

Data analysis was performed using IBM-SPSS, version 23. Descriptive statistics were used to calculate

frequencies, means, percentages, and standard deviations. Multiple-regression analysis was conducted to identify socio-demographic and personal variables associated with depression, anxiety, and stress in university students, with a significance level set at 0.05.

Results

Sample Description

A total of 561 university students participated in the study, and the gender distribution was nearly even, with 289 males and 272 females comprising the sample. The majority of the participants fell within the 18 to 24 age range, and were single (n=496, 88.4%). Furthermore, less than a half of the sample lived with their parents (n=242, 43.1%). The majority of respondents also maintained very good GPAs (n=235, 41.9%). Roughly a half of the students' mothers had an educational background of secondary education or lower (n=321, 57.2%). Similarly, about a half of the students' fathers had secondary education or lower (N=281, 50.1%). Most of the students reported a low family economic status (n=353, 62.9%) (See Table 1).

Table 1. Socio-demographics characteristics of the studied sample (N=561)

Variables (N=561)	Frequency	Percentage (%)
Gender		
Male	289	51.5
Female	272	48.5
Age		
18-24 years	544	97.0
25 years and above	17	3.0
Marital status		
Single	496	88.4
Married	37	6.6
Other	28	5.0
Working status		
Yes	74	13.2
No	487	86.8
Living with:		
Both parents	242	43.1
One of them	204	36.4
University housing	115	20.5
University		
AABU	204	36.3
JUST	121	21.6
Yarmouk	236	42.1
Specialization		
Scientific	374	66.7
Humanistic	187	33.3
Academic year		
First year	119	21.2
Second year	184	32.8
Third year	168	30.0

Variables (N=561)	Frequency	Percentage (%)
Fourth year	90	16.0
GPA		
Acceptable	82	14.6
Good	149	26.6
Very good	235	41.9
Excellent	95	16.9
Family economic status		
High	133	23.7
Medium	75	13.4
Low	353	62.9
Mother's education level		
Secondary and less	321	57.2
Undergraduate	216	38.5
Post-graduate	24	4.3
Father's education level		
Secondary and less	281	50.1
Undergraduate	238	42.4
Post-graduate	42	7.5
Psychological problems		
Yes	15	2.7
No	546	97.3
Parents diagnosed with mental illness		
Yes	11	2.0
No	550	98.0

Depression Sub-scale Items' Analysis

The study found that the mean score was (M=18.91, SD= 7.92), indicating a moderate level of depression, with scores spanning from 0 to 42. Specifically, 8.7% (n = 49) of students fell into the category of mild depression (scoring 10 to 13), 35.9% (n = 201) fell into the category of moderate depression (scoring 14-20),

while 30.1% (n = 169) were identified as severely depressed (scoring 21-27), and 13.5% (n = 76) were identified as extremely severely depressed (scoring 28 and above), whereas only 11.8% (n = 66) scored less than 10, suggesting a normal level of depression. (See Table 2).

Table 2. Descriptive statistics for the levels of depression, anxiety, and stress among the studied university students (N=561)

Variables	Frequency	Percentage (%)
Depression levels		
Normal 0-9	66	11.8
Mild 10-13	49	8.7
Moderate 14-20	201	35.9
Severe 21-27	169	30.1
Extremely severe ≥28	76	13.5
Anxiety levels		
Normal 0-7	53	9.4
Mild 8-9	13	2.3
Moderate 10-14	79	14.1
Severe 15-19	115	20.5
Extremely severe ≥ 20	301	53.7

Stress levels		
Normal 0-14	145	25.8
Mild 15-18	115	20.5
Moderate 19-25	173	30.8
Severe 26-33	115	20.5
Extremely severe ≥ 34	13	2.4

Anxiety Sub-scale Items’ Analysis

The analysis revealed that the mean score was (M=18.04, SD=7.76), indicating a severe level of anxiety. The majority of students experienced extremely severe levels of anxiety (≥ 20), comprising 53.7% (n=301) of the sample. Additionally, significant proportions of students reported severe (20.5%) (n=115) and moderate (14.1%) (n= 79) levels of anxiety, while smaller percentages experienced mild (2.3%) (n=13) or normal (9.4%) (n=53) levels of anxiety. (See Table 2).

Stress Sub-scale Items’ Analysis

The analysis revealed that the mean score was (M = 20.71, SD = 7.46), indicating a moderate level of stress. About 145 students (25.8%) indicated experiencing stress within the normal range (0-14), while a notable portion (30.8%) fell into the moderate-stress category (19-25). Additionally, a significant number of students (20.5%) reported mild stress levels (15-18), with a smaller cohort (20.5%) experiencing severe stress (26-33). A minimal proportion of students (2.4%) reported extremely severe stress levels (≥ 34). (See Table 2).

Predictors for Depression Symptoms

Four variables (psychological problems, having a parent diagnosed with a mental illness, living arrangements, and academic year) were found to predict depression symptoms and these four variables collectively explained 25.6% of the variation in depression symptoms (See Table 3). Psychological problems emerged as the most influential predictor, as it was associated with an average increase in depression symptoms by (B = 2.921, $p < 0.001$). Following this, having a parent diagnosed with a mental illness was the next significant predictor, linked to an average increase in depression symptoms by (B = 2.308, $p < 0.001$). Living with a single parent was identified as a significant predictor associated with a mean rise in depression symptoms of (B = 1.450, $p < 0.015$). Lastly, being in the final year of academic education, in comparison to the first year, was associated with an average increase in depression symptoms by (B = 1.387, $p = 0.040$). (See Table 3).

Table 3. Predictors of depression symptoms among the studied university students (N=561)

Model		B	Beta	R	Adjusted R ²	t-value	Sig. F change
1	Psychological problems (yes)	2.921	0.183	0.472	0.222	3.373	<0.001
2	Parent diagnosed with mental illness (yes)	2.308	0.140	0.489	0.237	2.886	<0.001
3	Living with one of the parents	1.450	0.091	0.497	0.247	2.430	0.015
4	Academic year (4 yeas)	1.387	0.086	0.508	0.256	2.383	0.040

Predictors for Anxiety Symptoms

The final model retained five predictors for anxiety; namely, academic year, living with one parent, specialization, GPA, and gender. This suggests that these variables collectively elucidated 25.9% of the variation in anxiety symptoms. Specifically, the second and third academic years showed an inverse relationship with decreased anxiety symptom levels (B = -1.752, $p < 0.001$ and B = -1.322, $p < 0.001$, respectively) on

average compared to the first year. Additionally, living with only one parent, as opposed to living with both parents, and pursuing a scientific specialization instead of a literary one were both linked to an increase in anxiety levels (B = 0.993, $p < 0.001$ and B = 0.902, $p = 0.004$, respectively) on average.

Regarding GPA, having an excellent or a very good GPA demonstrated a negative association with anxiety levels, indicating that possessing an excellent or a very

good GPA is connected to a reduction in anxiety by (B = -1.853, p = 0.002 and B = -1.670, p = 0.028, respectively) when compared to an acceptable grade.

Furthermore, being female, as opposed to being male, was associated with an increase in anxiety symptoms by (B = 0.633, p = 0.033) on average. (See Table 4).

Table 4. Predictors of anxiety symptoms among the studied university students (N=561)

Model		B	Beta	R	Adjusted R ²	t-value	Sig. F change
1	Academic year (second)	-1.752	-0.230	0.341	0.115	-5.950	<0.001
2	Academic year (third)	-1.322	-0.167	0.423	0.176	-4.161	<0.001
3	Academic year (fourth)	1.097	0.144	0.459	0.206	3.691	<0.001
4	Living with one of the parents	0.993	0.131	0.478	0.223	3.552	<0.001
5	Specialization	0.902	0.114	0.495	0.238	2.879	<0.001
6	GPA (excellent)	-1.853	-0.115	0.507	0.249	-3.145	0.002
7	GPA (very good)	-1.670	-0.079	0.513	0.254	-2.158	0.028
8	Gender (female)	0.633	0.087	0.519	0.259	2.136	0.033

Predictors for Stress Symptoms

The final model retained four predictors: whether either of parents has a mental illness, specialization, marital status, and GPA. This signifies that these variables jointly accounted for 22.3% of the variance in stress symptoms. Having either parent with a mental illness was associated with an increase in stress symptoms by an average of (B = 2.225, p < 0.001). Also, majoring in scientific fields, as opposed to literary ones, was linked to an increase in stress symptoms by an average of (B = 1.975, p < 0.001).

Conversely, marital status (married vs. other) and (single vs. other) were negatively correlated with stress

symptoms, with reductions of (B = -2.002, p < 0.001) and (B = -2.028, p = 0.031) on average, respectively. This suggests that being married or single was associated with lower stress symptoms compared to other marital statuses among students. Similarly, having a university GPA of excellent or very good, in contrast to acceptable, was negatively related to stress symptoms, with decreases of (B = -0.500, p = 0.006) and (B = -0.495, p = 0.010) on average, respectively. This indicates that students with excellent or very good GPAs experienced lower stress symptoms compared to those with acceptable GPAs (See Table 5).

Table 5. Predictors of stress symptoms among the studied university students (N=561)

Model		B	Beta	R	Adjusted R ²	t-value	Sig. F change
1	Parents having mental illness	2.225	0.149	0.410	0.167	3.741	<0.001
2	Specialization (scientific)	1.975	0.131	0.433	0.184	3.183	<0.001
3	Marital status (married)	-2.002	-0.133	0.454	0.202	-3.168	<0.001
4	GPA (excellent)	-0.500	-0.107	0.465	0.211	-2.449	0.006
5	GPA (very good)	-0.495	-0.103	0.475	0.219	-2.351	0.010
6	Marital status (single)	-2.082	-0.089	0.481	0.223	-2.121	0.031

Discussion

The findings of our study emphasize the significant mental-health challenges faced by Jordanian university students amidst the COVID-19 pandemic. Our results revealed moderate levels of depression, severe levels of anxiety, and moderate levels of stress among the surveyed students, with the prevalence of depression, anxiety, and stress symptoms in this study being 35.9%, 53.7%, and 30.8%, respectively. These findings align with previous research, highlighting the profound

impact of the pandemic on the mental well-being of individuals in Jordan (Al-Ajlouni et al., 2020; Azmi et al., 2022; Basheti et al., 2021; Hamaideh et al., 2022; Islam et al, 2020). The economic, social, and health-related ramifications of the pandemic likely contributed to the exacerbation of depression, anxiety, and stress symptoms among the student population.

The prevalence of depression, anxiety, and stress symptoms observed in our study exceeded rates reported in similar populations under normal circumstances (Asif

et al., 2020; Basheti et al., 2021; Sifat, 2020; Wang et al., 2021; Islam et al., 2020). This suggests a heightened level of psychological distress among Jordanian university students amid the pandemic. Several studies conducted on COVID-19 epidemic have consistently highlighted the increased prevalence of depression, anxiety, and stress among university students globally (Harries et al., 2021; Wang et al., 2021). In Bangladesh, for example, a significant proportion of university students have reported experiencing anxiety, stress, or sadness, with economic challenges and academic disruptions being the major contributing factors (Islam et al., 2020). Similarly, university students in other countries, such as Greece, China, and Spain, have also reported elevated levels of depression, anxiety, and stress associated with the pandemic (Harries et al., 2021). Academic demands, coupled with the abrupt shift to online learning, may have further overwhelmed students, contributing to their psychological burden (Basheti et al., 2021; Hamaideh et al., 2022; Mahmood et al., 2021). Concerns about academic performance, graduation, and future-employment prospects likely compounded these stressors (Alasqah et al., 2024; Aveiro-Róbaló et al., 2022; Radwan et al., 2021).

Consistent with previous studies, our study identified several socio-demographic variables as significant factors influencing students' psychological well-being during the pandemic. Psychological issues, such as anxiety disorders and mood disturbances, have been widely recognized as significant predictors of depression symptoms among university students. A study by Cao et al. (2020) found that students with pre-existing psychological issues were more likely to experience heightened depression symptoms during the pandemic due to increased stress and uncertainty. Further, parental mental illness has also emerged as a critical factor influencing students' mental-health outcomes. Research by Li et al. (2021) demonstrated that students with parents who had a history of mental illness were at greater risk of developing depression symptoms themselves, possibly due to genetic predispositions and familial stressors exacerbated by the pandemic.

Moreover, living arrangements have been identified as a key predictor of depression symptoms among students. A study by Son et al. (2020) revealed that students living alone or in non-supportive environments experienced higher levels of depression

symptoms compared to those living with family or supportive roommates, highlighting the importance of social support in buffering against psychological distress during the pandemic. Moreover, academic year has also been linked to depression symptoms, with senior students often reporting higher levels of depression compared to their junior counterparts. Research by Wang et al. (2021) found that the transition to remote learning and uncertainty about future-career prospects contributed to increased depression symptoms among senior students, underscoring the unique challenges faced by this demographic group during the pandemic.

Similarly, academic year, living arrangements, field of specialization, GPA, and gender have been identified as significant predictors of anxiety symptoms among university students. A study by Khan et al. (2021) reported that female students, students with lower GPAs, and those in highly competitive majors experienced higher levels of anxiety during the pandemic, reflecting the multi-faceted nature of anxiety among students.

Furthermore, variables such as parental mental illness, field of specialization, marital status, and GPA have been associated with stress symptoms. Research by Zhang et al. (2021) found that students with parents who experienced mental-health issues, as well as those in demanding academic programs and with lower GPAs, reported higher levels of stress during the pandemic, highlighting the importance of considering socio-demographic factors in understanding students' stress responses.

Notably, fourth-year students with acceptable GPAs exhibited higher levels of depression, stress, and anxiety, compared to those in other academic years. This result is in line with the findings of a study conducted in Saudi Arabia by Alasqah et al., where they found that first-year students exhibited lower levels of depression, anxiety, and stress compared to senior students (Alasqah et al., 2024). This could be attributed to the increased academic demands in the senior year and the nearing prospect of graduation, prompting considerations about the future. This finding emphasizes the unique challenges faced by students in their final year of study, including concerns about post-graduation plans and employment prospects. It also highlights the critical role of academic performance in shaping students' mental well-being during this pivotal period.

Implications for Nursing

The findings of this study highlight the significant burden of depression, anxiety, and stress symptoms among Jordanian university students amid the COVID-19 pandemic. Implications for nursing encompass a range of interventions aimed at screening, education, counseling, collaboration, and advocacy to support the mental-health needs of students. Further, nurses can contribute to the development of a holistic approach to mental-health care within university settings.

Furthermore, the current findings shed light on the importance of the role of stakeholders, such as the Ministry of Health (MOH), the Ministry of Higher Education (MOHE), parents, friends, teachers, healthcare providers, in disseminating knowledge, promoting health education, and implementing social-support programs aimed at enhancing youth psychological well-being and mental health. By collectively embracing these efforts, they can foster the development of a psychologically and socially healthy society, thereby contributing to the overall well-being of Jordanian youth.

Study Limitations

This study provides valuable information about depression, anxiety, and stress symptoms, but it has some limitations. Firstly, the study used a cross-sectional convenience sample; therefore, prospective follow-up studies may contribute to a deeper understanding and identification of direct causes related

to these symptoms. Secondly, the survey was conducted through an online questionnaire, which may introduce sample bias; however, the large sample size mitigated this risk. Finally, the sample was drawn from only one region in Jordan (the north) and included students from governmental universities exclusively, not encompassing all Jordanian universities. This may restrict the generalizability of the results to the broader population beyond the northern region of Jordan.

Conclusions

The primary results of the present research indicate that the students who participated reported experiencing levels of depression, anxiety, and stress ranging from moderate to severe. Specifically, the study found that 35.9% exhibited depression symptoms, 53.7% showed signs of anxiety, and 30.8% experienced stress. Hence, it is crucial to implement measures aimed at enhancing the resilience and coping mechanisms of Jordanian university students, alongside fostering social support networks, to address their mental-health needs, both during and after the COVID-19 pandemic.

Conflict of Interests

The authors declare no conflict of interests.

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REFERENCES

- Al-Ajlouni, Y.A., Park, S.H., Alawa, J., Shamaileh, G., Bawab, A., El-Sadr, W.M., & Duncan, D.T. (2020). Anxiety and depression symptoms are associated with poor sleep health during a period of COVID-19-induced nationwide lockdown: A cross-sectional analysis of adults in Jordan. *BMJ Open*, *10* (12), e0419955.
- Alasqah, I., Alhamdan, A., Alhourri, M., & Alfehaid, M. (2024). Socio-demographic determinants of depression, anxiety, and stress immediately after the COVID-19 pandemic: A cross-sectional study among university students in Saudi Arabia. *Front. Public Health*, *11*, 1271536. <https://doi:10.3389/fpubh.2023.1271536>
- AlAzzam, M., Abuhammad, S., Alhmoud, A., & Hamdan- Mansour, A. (2021). Predictors of depression and anxiety among senior high-school students during COVID-19 pandemic: The context of home quarantine and online education. *The Journal of School Nursing*. <https://doi:10.1177/1059840520988548>
- Al-Rabiaah, A., Temsah, M.H., Al-Eyadhy, A.A., Hasan, G.M., Al-Zamil, F., Al-Subaie, S., ..., & Somily, A.M. (2020). Middle East respiratory syndrome-corona virus (MERS-CoV)-associated stress among medical students at a university teaching hospital in Saudi Arabia. *Journal of Infection and Public Health*, *13* (5), 687-691.
- Asif, S., Mudassar, A., Shahzad, T.Z., Raouf, M., & Pervaiz, T. (2020). Frequency of depression, anxiety and stress among university students. *Pakistan Journal of Medical Sciences*, *36* (5), 971.
- Aveiro-Róbaló, T.R., Garlisi-Torales, L.D., Chumán-

- Sánchez, M., Pereira-Victorio, C.J., Huaman-Garcia, M., Failoc-Rojas, V.E. et al. (2022). Prevalence and associated factors of depression, anxiety, and stress in university students in Paraguay during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *19*, 12930. <https://doi.org/10.3390/ijerph191912930>
- Azmi, F.M., Khan, H.N., Azmi, A.M., Yaswi, A., & Jakovljevic, M. (2022). Prevalence of COVID-19 pandemic: Self-esteem and its effect on depression among university students in Saudi Arabia. *Frontiers in Public Health*, *10*, 836688. <https://doi.org/10.3389/fpubh.2022.836688>
- Basheti, I.A., Mhaidat, Q.N., & Mhaidat, H.N. (2021). Prevalence of anxiety and depression during COVID-19 pandemic among healthcare students in Jordan and its effect on their learning process: A national survey. *PloS One*, *16* (4), e0249716.
- Brooks, S.K., Webster, R.K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G.J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, *395* (10227), 912-920.
- Cao, W. et al. (2020) The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, *287*, Article ID: 112934. <https://doi.org/10.1016/j.psychres.2020.112934>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power-analysis program for social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39* (2), 175-191.
- Gutiérrez-Hernández, M.E., Fanjul, L.F., Díaz-Megolla, A., Reyes-Hurtado, P., Herrera-Rodríguez, J.F., Enjuto-Castellanos, M.D.P., & Peñate, W. (2021). COVID-19 lockdown and mental health in a sample population in Spain: The role of self-compassion. *International Journal of Environmental Research and Public Health*, *18* (4), 2103.
- Hamaideh, S.H., Al-Modallal, H., Tanash, M.A., & Hamdan-Mansour, A. (2022). Depression, anxiety and stress among undergraduate students during COVID-19 outbreak and home quarantine. *Nursing Open*, *9* (2), 1423-1431.
- Hanawi, S.A., Saat, N.Z.M., Zulkafly, M., Hazlenah, H., Taibukahn, N.H., Yoganathan, D., ..., & Low, F.J. (2020). Impact of a healthy lifestyle on the psychological well-being of university students. *International Journal of Pharmaceutical Research & Allied Sciences*, *9* (2).
- Harries, A.J., Lee, C., Jones, L. et al. Effects of the COVID-19 pandemic on medical students: A multi-center quantitative study. *BMC Med. Educ.*, *21*, 14 (2021). <https://doi.org/10.1186/s12909-020-02462-1>
- Islam, M.A., Barna, S.D., Raihan, H., Khan, M.N.A., & Hossain, M.T. (2020). Depression and anxiety among university students during the COVID-19 pandemic in Bangladesh: A web-based cross-sectional survey. *PloS One*, *15* (8), e0238162.
- Jaradat, S., & Ajlouni, A. (2021). Undergraduates' perspectives and challenges of online learning during the COVID-19 pandemic: A case from the University of Jordan. *Journal of Social Studies Education Research*, *12* (1), 149-173.
- Khan, U. R., Khan, G. M., & Arbab, K. (2021). Creating 'COVID-safe' face-to-face teaching: Critical reflections on on-campus teaching during a pandemic. *Journal of University Teaching & Learning Practice*, *18*(5). <https://doi.org/10.53761/1.18.5.9>.
- Kola, L., Kohrt, B.A., Hanlon, C., Naslund, J.A., Sikander, S., Balaji, M., ..., & Gonsalves, P. (2021). COVID-19 mental-health impact and responses in low-income and middle-income countries: Reimagining global mental health. *The Lancet Psychiatry*, *8* (6), 535-550.
- Li, Y., Wang, A., Wu, Y., Han, N., & Huang, H. (2021). Impact of the COVID-19 pandemic on the mental health of college students: A systematic review and meta-analysis. *Frontiers in Psychology*, *12*, 669119. <https://doi.org/10.3389/fpsyg.2021.669119>
- Lovibond, S.H., & Lovibond, P.F. (1995). *Manual for the depression-anxiety-stress scales*. 2nd Edition. Sydney: Psychology Foundation.
- Mahmood, Z., Saleem, S., Subhan, S., & Jabeen, A. (2021). Psychosocial reactions of Pakistani students towards COVID-19: A prevalence study. *Pakistan Journal of Medical Sciences*, *37* (2), 456.
- Moussa, M.T., Lovibond, P., Laube, R., & Megahead, H.A. (2017). Psychometric properties of an Arabic version of the depression anxiety stress scales (DASS). *Research on Social Work Practice*, *27* (3), 375-386. <https://doi.org/10.1177/1049731516662916>
- National Academies of Sciences, Engineering, and Medicine. (2021). *Mental health, substance use, and well-being in higher education: Supporting the whole student*. National Academies Press.
- Palaniappan, K., Natarajan, R., & Dasgupta, C. (2022). Prevalence and risk factors for depression, anxiety and

- stress among foreign construction workers in Singapore: A cross-sectional study. *International Journal of Construction Management*, 1-9.
- Radwan, E., Radwan, A., Radwan, W., & Pandey, D. (2021). Prevalence of depression, anxiety and stress during the COVID-19 pandemic: A cross-sectional study among Palestinian students (10-18 years). *BMC Psychology*, 9 (1), 1-12.
- Ramón-Arбуés, E., Gea-Caballero, V., Granada-López, J. M., Juárez-Vela, R., Pellicer-García, B., & Antón-Solanas, I. (2020). The prevalence of depression, anxiety and stress and their associated factors in college students. *International Journal of Environmental Research and Public Health*, 17 (19), 7001.
- Saraswathi, I., Saikarthik, J., Kumar, K. S., Srinivasan, K. M., Ardhanaari, M., & Gunapriya, R. (2020). Impact of COVID-19 outbreak on the mental-health status of undergraduate medical students in a COVID-19 treating medical college: A prospective longitudinal study. *PeerJ.*, 8, e10164.
- Sifat, R.I. (2020). COVID-19 pandemic: Mental stress, depression, and anxiety among university students in Bangladesh. *Soc. Psychiatry*, 1 (2).
- 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>
- Vigo, D., Thornicroft, G., & Atun, R. (2016). Estimating the true global burden of mental illness. *The Lancet Psychiatry*, 3 (2), 171-178.
- Wang, C., Tee, M., Roy, A., Fardin, M., Srichokchatchawan, W., Habib, H., Tran, B., Hussain, S., Hoang, M., Le, X., Ma, W., Pham, H., Shirazi, M., Taneepanichskul, N., Tan, Y., Tee, C., Xu, L., Xu, Z., Vu, G., Zhou, D., Koh, B., McIntyre, R., Ho, C., Ho, R.C., & Kuruchittham, V. (2021). The impact of COVID-19 pandemic on physical and mental health of Asians: A study of seven middle-income countries in Asia. *PLoS One*, 16 (2), e0246824. <https://doi.org/10.1371/journal.pone>
- Wang, C., Wen, W., Zhang, H., Ni, J., Jiang, J., Cheng, Y., Zhou, M., Ye, L., Feng, Z., Ge, Z., Luo, H., Wang, M., Zhang, X., & Liu, W. (2021). Anxiety, depression, and stress prevalence among college students during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of American College Health*, 1-8 <https://doi.org/10.1080/07448481.2021.1960849>
- Zeng, W., Chen, R., Wang, X., Zhang, Q., & Deng, W. (2019). Prevalence of mental-health problems among medical students in China: A meta-analysis. *Medicine*, 98 (18).
- Zhang, T.H. (2021). Chinese parents' perception of emergency remote K-12 teaching-learning in China during the COVID-19 pandemic. *Asian Journal of Distance Education*, 16 (1), 16-30. <https://doi.org/10.5281/zenodo.4567480>