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Prevalence of Depression, Anxiety, and Stress among Jordanian University Students: A Nationwide Cross-sectional Study

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Abstract

Purpose. Different local, regional and international reports highlighted the increased prevalence of mental health disturbances and their effect on health. This study aimed at investigating the prevalence rates of depression, anxiety and stress among Jordanian university students and exploring the associated socio-demographic factors.

Method. A random sample of 850 university students from different Jordanian universities were recruited in this study during the first semester of the academic year 2021/2022. The Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and the Perceived Stress Scale 10 were used to collect data from the study participants. Data were analyzed using the Statistical Package of Social Sciences (SPSS). Descriptive statistics, Chi-Square test and Fishers Exact test were used to analyze the harvested data.

Results. The results of the study showed that 5.1% (n=43), 2.1% (n=18), 1.3% (n=11) had moderate, severe and extremely severe depression, respectively. In addition, it was found that 26.9% (n=229), 8.6% (n=73), 3.5% (n=30) had mild, moderate and severe anxiety, respectively. Moreover, it was found that 21.3% (n=181) had moderate level of stress and 3.2% (n=27) had high perceived stress. The findings of the study showed that age, gender, family monthly income, academic year and academic specialization were factors associated with increased prevalence of depression, anxiety and stress among Jordanian university students.

Conclusion. The study concluded that there is an elevated levels of depression, stress and anxiety among Jordanian university students compared to previously reported prevalence rates. In addition, the study concluded that depression, anxiety and stress levels are associated with university students' age, gender, family monthly income, academic year and academic specialization. The study recommended increasing students' awareness about adopting different coping mechanisms to alleviate levels of different mental health disturbances.

Keywords: depression, stress, anxiety, prevalence, university students, Jordan

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Распространенность депрессии, тревоги и стресса среди иорданских студентов: общенациональное межсекторальное исследование

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Резюме

Цель. В различных местных, региональных и международных отчетах подчеркивалась возросшая распространенность психических расстройств и их влияние на здоровье. Целью данного исследования было изучение показателей распространенности депрессии, тревоги и стресса среди студентов иорданских университетов и связанных с ними социально-демографических факторов.

Метод. В ходе исследования в течение первого семестра 2021/2022 учебного года была набрана случайная выборка из 850 студентов из различных иорданских университетов. Для сбора данных от участников исследования использовались опросник депрессии Бека (BDI), опросник тревожности Бека (BAI) и опросник ШВС-10 (PSS-10). Данные были проанализированы с использованием статистического пакета социальных наук (SPSS). Для анализа собранных данных использовались описательная статистика, критерий Хи-квадрат и точный тест Фишера.

Результаты. Результаты исследования показали, что у 5,1% (n=43), 2,1% (n=18), 1,3% (n=11) была умеренная, тяжелая и крайне тяжелая депрессия соответственно. Кроме того, было обнаружено, что 26,9% (n=229), 8,6% (n=73), 3,5% (n=30) испытывали легкую, умеренную и сильную тревогу соответственно. Более того, было обнаружено, что 21,3% (n=181) имели умеренный уровень стресса, а 3,2% (n=27) – высокий уровень стресса. Результаты исследования показали, что возраст, пол, ежемесячный доход семьи, учебный год и академическая специализация были факторами, связанными с повышенной распространенностью депрессии, тревоги и стресса среди студентов иорданских университетов.

Заключение. В исследовании был сделан вывод о том, что среди иорданских студентов университетов отмечаются повышенные уровни депрессии, стресса и тревоги по сравнению с ранее сообщенными показателями распространенности. Кроме того, депрессия, тревога и стресс связаны с возрастом, полом, ежемесячным доходом семьи, учебным годом и академической специализацией студентов университетов. В исследовании было рекомендовано повысить осведомленность учащихся о необходимости использования различных механизмов для преодоления различных психических расстройств.

Ключевые слова: депрессия, стресс, тревожность, распространенность, студенты университетов, Иордания

■ INTRODUCTION

College life can be among the most rewarding and challenging time periods in a young person's life (Beiter et al., 2015; Samawi et al., 2022). Increasingly, students are in need for mental health care and support for their well-being. Thirty-nine (39%) of students reported feeling so depressed that they were having trouble functioning, 61% reported that they experienced overwhelming anxiety in the last 12 months (Son et al., 2020). In addition, center for collegiate mental health reported that the number of students using counselling centers increased by approximately 30% on average from 2009 to 2015 (Xiao et al., 2017). A lot of challenges are encountered in the university campuses with a student population (Bayly et al., 2020).

Mental health disorders can affect everyone's quality of life in a complex aspect of physical wellbeing, mental state, personal beliefs, including social interactions (Gerino et al., 2017). College life is one of the most challenging stage of human development where people are experiencing process of expanding autonomies and opportunities in advancing people's well-being (Osher et al., 2020). College students taking up medicine, nursing, pharmacy and laboratory science or even humanitarian or social sciences are highly vulnerable to depression given the fact of a heavy workload in completing course requirements, examinations and training demands of the curriculum (Gao et al., 2020). The negative effect of depression, anxiety or stress affects their academic performance as well as their health (Samawi & Shaheen, 2019). Regular evaluation of students and early identification of the signs of depression will prevent the negative effects and will facilitate early management for those who are affected (Pascoe et al., 2020). If this condition will continue students may feel loss of appetite, self-isolation, extreme feeling of sadness, low self confidence in performing activities in the college, difficulty focusing to study, difficulty sleeping and worst this can take the lead to suicide thoughts (Melaku et al., 2015).

Depression, anxiety and stress are considered a two-sequence process that involves a stimulus and a response (Millett-Thompson, 2017). When a person is faced with an event that is perceived as challenging or threatening, called the stressor, he or she experiences a stress reaction that often involves fear and/or anxiety. For instance, college students often mention tests as a source of stress (the stressor or stimulus) and describe the trepidation they felt while preparing for and taking the exams (Rehman et al., 2021). For example, Depression is one of the most prevalent mental disorders in the world, which has an impact on both physical and psychological health. Depression is a medical condition, and not caused by a chemical imbalance, or electrical functions in certain areas of the brain as some believe. Basically, with depression, the core features are some ongoing bad mood disturbance, lowered mood, feeling sad, and feeling blue (Lacasse and Leo, 2015).

The World Health Organization reported that depression is the leading cause of disability around the globe and in their latest report there are 350 million people worldwide suffer from depression (WHO, 2019). In the United States, the National Institute of Mental Health estimates that 16 million adults had at least one major depressive episode in 2012,

which is formulate 6.9% of the population. While in Saudi Arabia, it had been reported that 1.4 million individuals, that is 4.5% of the population, were diagnosed with depressive disorders. Depression is not confined to certain groups; it can affect people in all regions, from all countries and societies (NIMH, 2020).

In general, the literature shows several factors that likely lead to depression, including social, psychological, and biological factors. Depression, stress and anxiety might progress and negatively affect an individual's whole life. Furthermore, its effect is not limited to the negative change of the psychological state like sadness, pessimism, self-criticalness, lack of value, speed of anger, and loss of enjoyment (Chauvet-Gelinier & Bonin, 2017). But it extends to include the negative impact on their physical condition, such as energy loss, the difficulty of sleeping, laziness, the difficulty of concentrating, changes in appetite, food, and sex. Individuals who experience certain adverse life events (such as loss of a job or losing a partner) are more susceptible to depression development (Cohen et al., 2015). Lower-income, poor social relations either with peers or family members, living alone, and emotional abuse were reported as factors influencing the development of depression, stress and anxiety among youth in addition to lack of exercise, smoking, and excessive use of medication (Raheel, 2015).

Previous Studies

A cross-sectional study was conducted that aimed to assess the level of depression among undergraduate Saudi medical students. A study sample consisted of 2.562 medical students was selected conveniently from twenty higher education institutions. The study findings revealed that there is a highly reported prevalence rate of depression among Saudi medically specialized students (83.4%). In addition, it was reported that symptoms of depression were significantly associated with academic level, living area, and being a smoker (Alharbi et al., 2018).

In another study, the researchers sought to explore the prevalence of depression and suicide ideas, through performing a systematic literature review. A number of 183 studies were reviewed in the current study. The findings of the review showed that the estimated prevalence rate of depression among the study Respondents was 27.2% whereas the existence of suicide thoughts was prevalent among 11.1% (Rotenstein et al., 2016).

Another cross-sectional study was conducted that aimed at exploring the prevalence of depression among Vietnamese medical specializations students. In addition, the study sought to identify the risk factors associated with depression. A Patient Health Questionnaire 9, an academic motivation scale (AMS) and International Physical Activity Questionnaire (IPAQ) were adopted to elicit data in this study. The findings of the survey revealed that depression prevalence rate was 15.2% of the surveyed medical students. Furthermore, it was reported that depression had a significant correlation with the perceived financial burden, physical inactivity, academic level, night shift working, and academic motivation (Pham et al., 2019).

Another study implemented a cross-sectional study that aimed at assessing the levels of depression among Sudanese medical specializations undergraduates. A stratified random sample consisted of 440 Sudanese medicals students were recruited in this study. The Patient Health Questionnaire 9 (PHQ-9) was adopted as a data gathering tool in this study. The findings of the study showed that moderately severe and severe depression were prevalent among 10.2% and 5.5% of the medical students, respectively. In addition,

the study reported that both age and gender were not significantly in association with the prevalence of depression among medical students (Mohammed et al., 2017).

Kebede et al. (2019) estimated the prevalence of both depression and anxiety among Ethiopian medical students, in addition to identifying the associated risk factors with depression and anxiety. A quantitative cross-sectional survey was performed over a study sample comprised of 273 Ethiopian medical students. The Hospital Anxiety and Depression Scale (HADS) was adopted to collect data from the study Respondents. The findings showed that the prevalence rate of depression was 51.30%, whereas the prevalence rate of anxiety was 30.1%. Furthermore, the study found that the educational level and the social support were significantly correlated with both anxiety and depression levels.

In one of the studies to estimate the level of depression among Saudi medical students enrolled in Taibah University. The researchers performed a cross-sectional study that included the recruitment of 555 medical students. A self-filled questionnaire was distributed electronically over the study Respondents. The results of the study revealed that depression is prevalent in a rate of 28.3% among Saudi medical students. The study reported that gender and marital status were significantly correlated to the prevalence of depression among Saudi medical students (Al-Raddadi et al., 2016).

A cross-sectional study was performed, which aimed at estimating the prevalence rate of depression among Cameroonian medical students. A randomly selected study sample consisted of 618 Respondents was recruited in this study. The findings of the study indicated that about 30.6% of the study Respondents had major depressive disorders. Mild depression was prevalent among 34.6%, moderate depression was prevalent among 26.4%, and moderately severe depression and severe depression were reported to be prevalent among 3.4% and 0.8%, respectively. Furthermore, the study reported that depression is not significantly associated with the students' academic performance (Ngasa et al., 2017).

A study measured the prevalence of depression among Egyptian medical students who were enrolled in Al-Fayoum University. A self-filled questionnaire was used to collect data from the study Respondents (Depression, Anxiety, and Stress Scale – 21). The findings indicated that out of 442 recruited students, depression was prevalent among 60.8% in addition, the study reported that depression had a significant correlation to the students' age and socioeconomic state of the participating students (Abdel Wahed and Hassan., 2019).

In a cross-sectional survey carried out over the Indian medical students, the study assessed the prevalence of depression and its related risk factors. A sample of 444 medical students were recruited in this cross-sectional study and they were asked to fill the Beck Depression Inventory (BDI). The findings of the study showed that mild, moderate and severe depression were prevalent among 33.6%, 13.5% and 0.7% of the Indian medical students, respectively. Moreover, the study reported that depression was significantly lower among those students who had lower levels of stress (Kumar et al., 2017).

Assessment of the Nigerian medical students' susceptibility to depression. A random study sample consisted of 352 medical students was recruited in this study. The researchers administered a self-filled questionnaire to the study Respondents. The findings of the study showed that about 4% of the Nigerian medical students were having moderate to severe depression. In addition, the study reported that both gender and age are not significantly associated with depression susceptibility (Tamunosiki et al., 2017).

Ibrahim and Abdelreheem (2015) investigated the prevalence of anxiety and depression among Egyptian medical students. The study sample consisted of 164 medical undergraduates at Alexandria University. The study adopted both the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI). The study findings indicated that the prevalence of depression and anxiety among the investigated Respondents were 57.9% and 43.9%, respectively. Mild mood disturbance was prevalent among 22.6%, borderline clinical depression was prevalent among 20.7%, moderate depression was prevalent among 24.4%, severe and extreme depression were prevalent among 11.6% and 1.2%, respectively.

Iqbal et al., (2015) conducted a cross-sectional study that focused on assessing the level of depression, anxiety and stress among the undergraduate medical students and the correlation of their demographic variables with the level of depression. The study sample consisted of 353 undergraduate medical students at the Institute of Medical Sciences at Bhubaneswar, Odisha, India. The researchers used the Depression Anxiety Stress Scale (DASS 42) scale to collect data from the Respondents. The study findings revealed that 51.3% of the study Respondents were affected with depression, 66.9% were exhibiting anxiety and 53% were stressed.

■ MATERIALS AND METHODS

Research Design

The present study was a nation-wide cross-sectional study that was performed over different Jordanian universities. The cross-sectional design was adopted in this study due to its benefits as it is a quick, cost-effective and suitable to achieve the study objectives. The cross-sectional design is used to measure the prevalence of a disease at a specific time point. It is used to snapshot the reality of a variable at a specific time point within a specific population.

Research Population

The population of the present study was all Jordanian and non-Jordanian university students who are enrolled at both private and public Jordanian universities in the second semester of the academic year 2021/2022. According to the statistics released by the Jordanian ministry of higher education, there were 298819 students who are enrolled in different academic specializations within the public and private Jordanian universities.

Research Sample

Random sampling was used to recruit the study participants. The sample size was calculated using Raosoft program, with a 95% confidence interval and 5% margin of error. The minimum sample size was found to be 384. However, a total of 850 participants were enrolled in this study. The participants were from Jordanian universities within different regions in Jordan and withdrawn from different faculties and academic specializations.

Data Collection Tools

To collect data, the researchers developed a questionnaire that consisted of four parts. The first part was used to elicit the students' socio-demographic characteristics (age, gender, academic year, family monthly income, and type of university). The second part of the questionnaire was the Beck Depression Inventory Scale formulated

by Aaron T. Beck in 1961 and later revised in 1978. Beck Depression Inventory II is composed of 21-question multiple-choice self-report inventory. The study included the demographic profile of the respondents in the questionnaire to be administered (Appendix A, Page 58). The researcher used the English-Arabic version of the scale that was translated by Dr. Abdul Sattar Ibrahim from the Faculty of Medicine at King Faisal University (Appendix A, Page 58). The bilingual scale was used to ensure that the students are fully understanding the items of the questionnaire. The following guidelines have been suggested to interpret the response of the respondents:

- 1–10 These Ups and Downs Considered Normal.
- 11–16 Mild Mood Disturbance.
- 17–20 Borderline Clinical Depression.
- 21–30 Moderate Depression.
- 31–40 Severe Depression.
- Over 40 Extreme Depression.

The researcher ensured the validity of the study scale through submitting the primary version of the scale to a group of specialists in psychologists in order to get their comments and feedback regarding the language, clarity and appropriateness of the scale items. The valid and reliable adopted scale was administered to the study respondents as a whole package that included a consent form and a cover page introducing the title of the study, the aim and the ethical considerations.

The third part of the study questionnaire was the Perceived Stress Scale 10 (PSS-4) developed by Cohen (1983) and consisted of 10 items scaled as Never (0), Almost never (1), sometimes (2), fairly often (3) and often (4). Questions 4, 5, 7, and 8 were reversed. The lowest score is 0 and the highest score is 40. Higher scores are correlated to more stress among the study participants.

Finally, the fourth part is the Beck Anxiety Inventory questionnaire (BAI) was used to assess anxiety among university students. Each of the 21 items corresponding to a symptom of anxiety is summed to give a single score for the BAI. There is a four-point scale for each item ranging from 0 to 3. BAI score ranges from 0 to 63. Each of the 21 items was scored from 0 ("not at all") to 3 ("severely – it bothered me a lot"). The total score of 0–21 is low anxiety, 22–35 is moderate anxiety, and over 36 is potentially concerning levels of anxiety. BDI was validated on the Arabian context by Samreen et al (2020) and its reliability was 0.79.

Data Collection Procedure

The data collection procedure was performed during the period between February and April/2022. The questionnaire was submitted via official channels to public and private universities as an electronic survey that was distributed over university students through official university mail. The questionnaire was opened for a period of two weeks in order to collect the highest number of hits from university students. Finally, the data was retrieved from the electronic questionnaire as an Excel file.

Data Analysis

The data analysis was performed using the Statistical Package of Social Sciences (SPSS) (v. 26, IBM Corp. Chicago, IL, USA). Descriptive statistics were used to analyze the participants' distribution based on sociodemographic characteristics, levels of depression,

anxiety and stress. Differences in depression, stress, and anxiety levels among the Jordanian university students were analyzed using Chi-Square test and Fishers exact test. A significance level of ($\alpha \leq 0.05$) was used as a statistical significance threshold.

■ RESULTS

A sample of 850 university students participated in this cross-sectional study. As illustrated in table (1), the mean age of the enrolled university students was (21.6 ± 2.3). Females constituted 41.3% ($n=351$), whereas males constituted 58.7% ($n=499$). In addition, it was found that the highest representation in term of monthly family income was for the university students having a family monthly income ranging between 301 and 600 JOD (82.1%, $n=698$). The results showed that third year students constituted 67.4% ($n=573$) among the enrolled university students. In addition, it was found that students from medical and health related specializations were the most represented category as they constituted 33.1% ($n=281$) of the enrolled university students. Finally, it was found that university students from public Jordanian university constituted 74.5% ($n=633$), whereas university students from private Jordanian universities were representing 25.5% ($n=217$).

The results presented in table (2) showed that 5.1% ($n=43$) of the enrolled Jordanian university students had moderate depression, whereas 2.1% ($n=18$) had severe depression, and 1.3% ($n=11$) had extremely severe depression. In addition, it was found

Table 1
Enrolled university students' socio-demographic characteristics (n=850)

Variable	M (SD)	F (%)
Age		
1. Less than 20	21.6 (2.3)	149 (17.5)
2. 20–22		621 (73.1)
3. More than 22		80 (9.4)
Gender		
1. Female		351 (41.3)
2. Male		499 (58.7)
Family Income (Monthly/JOD)		
1. Less than 300	536 (255.6)	21 (2.5)
2. 301–600		698 (82.1)
3. More than 600		131 (15.4)
Academic Year		
1. First Year		91 (10.7)
2. Second Year		114 (13.4)
3. Third Year		573 (67.4)
4. Fourth Year or more		72 (8.5)
Academic Specialization		
1. Humanitarian		141 (16.6)
2. Medical & health related		281 (33.1)
3. Engineering and computer related		136 (16)
4. Social sciences		142 (16.7)
5. Other		150 (17.6)
Type of University		
1. Public		633 (74.5)
2. Private		217 (25.5)

Table 2
Levels of Depression, anxiety and stress among enrolled university students (n=850)

Variable	Total (n=850)	Public (n=633)	Private (n=217)	χ ²	p
	F (%)	F (%)	F (%)		
Depression					
Normal (1–10)	461 (54.2)	320 (50.6)	141 (65)	23.411	0.000*
Mild Mood Disturbance (11–16)	246 (28.9)	203 (32.1)	43 (19.8)		
Borderline Clinical Depression (17–20)	71 (8.4)	61 (9.3)	10 (4.6)		
Moderate Depression (21–30)	43 (5.1)	32 (5.1)	11 (5.1)		
Severe Depression (31–40)	18 (2.1)	10 (1.6)	8 (3.7)		
Extremely severe depression (over 40)	11 (1.3)	7 (1.1)	4 (1.8)		
Anxiety					
Minimal anxiety levels (0–7)	518 (60.9)	412 (65.1)	106 (48.8)	18.533	0.000*
Mild anxiety (8–15)	229 (26.9)	151 (23.9)	78 (35.9)		
Moderate anxiety (16–25)	73 (8.6)	51 (8.1)	22 (10.1)		
Severe anxiety (26–63)	30 (3.5)	19 (3)	11 (5.1)		
Stress					
Low stress (0–13)	642 (75.5)	491 (77.6)	151 (69.6)	7.0461	0.03*
Moderate stress (14–26)	181 (21.3)	121 (19.1)	60 (27.6)		
High perceived stress (27–40)	27 (3.2)	21 (3.3)	6 (2.8)		

Note: * Significant at significance level ($\alpha \leq 0.05$).

that 26.9% (n=229) had mild anxiety, 8.6% (n=73) had moderate anxiety and 3.5% (n=30) had severe anxiety. Moreover, it was found that 21.3% (n=181) had moderate level of stress and 3.2% (n=27) had high perceived stress. The results presented in table (2) showed that there were significant differences between public and private universities in the levels of depression ($X^2=23.411$, $p=0.000$), anxiety ($X^2=18.533$, $p=0.000$), and stress ($X^2=7.0461$, $p=0.003$).

The results presented in table (3) showed that there were significant differences in depression levels between the enrolled university students referred to their sociodemographic characteristics (age, gender, monthly family income, academic year and specialization). The university students aged 20 to 22 had the highest levels of moderate depression (39.5%), severe depression (61.1%) and extremely severe depression (54.6%). With regard to gender, male university students had higher prevalence of moderate depression (58.1%), severe depression (66.7%), and extreme severe depression (63.6%) compared to females. In addition, it was found that university students with a family monthly income ranging between 301 and 600 JOD had higher prevalence of moderate depression (69.8%), severe depression (61.1%) and extremely severe depression (36.4%). With regard to the academic year, it was found that third year students had higher prevalence rates of moderate depression (60.5%), severe depression (33.3%) and extremely severe depression (36.4%) compared to university students from other academic years. Finally, it was found that university students from medical and health related specializations and students from social sciences specializations had highest prevalence rate of moderate depression (30.2%) for each category, whereas severe depression was more prevalent among students from medical and health related

Table 3
Prevalence of depression among Jordanian university students according to their socio-demographic variables

Variable	Normal (n=461)	Mild Mood Disturbances (n=246)	Borderline clinical depression (n=71)	Moderate depression (n=43)	Severe depression (n=18)	Extremely severe (n=11)	P value
Age							
1. Less than 20	51(11)	58 (23.6)	15 (21.1)	15 (34.9)	6 (33.3)	4 (36.4)	≤0.05
2. 20–22	382 (82.9)	153 (62.2)	52 (73.2)	17 (39.5)	11 (61.1)	6 (54.6)	
3. More than 22	28 (6.1)	35 (14.2)	4 (5.6)	11 (25.6)	1 (5.6)	1 (9.1)	
Gender							
1. Female	186 (40.3)	71 (28.9)	66 (92.9)	18 (41.9)	6 (33.3)	4 (36.4)	≤0.05
2. Male	275 (59.7)	175 (71.1)	5 (7.1)	25 (58.1)	12 (66.7)	7 (63.6)	
Family Income (Monthly/JOD)							
1. Less than 300	1 (0.2)	2 (0.8)	7 (9.9)	5 (11.6)	2 (11.1)	4 (36.4)	≤0.05
2. 301–600	358 (77.7)	239 (97.2)	56 (78.9)	30 (69.8)	11 (61.1)	4 (36.4)	
3. More than 600	102 (22.1)	5 (2)	8 (11.2)	8 (18.6)	5 (27.8)	3 (27.3)	
Academic Year							
1. First Year	49 (10.6)	28 (11.4)	3 (4.2)	6 (14)	3 (16.7)	2 (18.2)	≤0.05
2. Second Year	63 (13.7)	19 (7.7)	18 (25.4)	6 (14)	5 (27.8)	2 (18.2)	
3. Third Year	308 (66.8)	187 (76)	42 (59.2)	26 (60.5)	6 (33.3)	4 (36.4)	
4. Fourth Year or more	41 (8.9)	12 (4.9)	8 (11.2)	5 (11.6)	4 (22.2)	3 (27.3)	
Academic Specialization							
1. Humanitarian	118 (25.6)	6 (2.4)	8 (11.3)	4 (9.3)	3 (16.7)	2 (18.2)	≤0.05
2. Medical & health related	169 (36.7)	63 (25.6)	29 (40.8)	13 (30.2)	5 (27.8)	2 (18.2)	
3. Engineering and computer related	91 (19.7)	27 (11)	9 (12.7)	4 (9.3)	3 (16.7)	2 (18.2)	
4. Social sciences	55 (11.9)	53 (21.5)	15 (21.1)	13 (30.2)	2 (11.1)	4 (36.4)	
5. Other	28 (6.1)	97 (39.4)	10 (14.1)	9 (21)	5 (27.8)	1 (9)	

Note: * Significant at significance level ($\alpha \leq 0.05$).

specializations and students from specializations other than those categorized in this study. However, extremely severe depression was more prevalent among students from social sciences specializations.

The results presented in table (4) showed that there were significant differences in stress levels between the enrolled university students referred to their sociodemographic characteristics (age, gender, monthly family income, academic year and specialization). The results showed that university students aged 20 to 22 years had highest prevalence rate of low stress (70.2%), moderate stress (84.5%), and high stress (62.9%). In addition, it was found that there is a higher prevalence rate of stress among males compared to females. Low stress was prevalent among 61.2% of males, whereas moderate and high stress levels were prevalent among 84.5% and 62.9% of males, respectively. Moreover, it was found that university students having a monthly family income had higher prevalence rates of low stress (79.6%), moderate stress (93.4%), and high stress (66.7%). Moreover, it was found that third year students had higher prevalence rates of low stress (73.4%), moderate stress (48.1%), and high stress (55.6%). Finally, it was found that medical and health related students had higher prevalence rates of low stress (26.6%) and moderate stress (57.5%), whereas high stress was more prevalent among students from humanitarian specializations (59.3%).

Table 4
Prevalence of Stress among Jordanian university students according to their socio-demographic variables

Variable	Low Stress (n=642)	Moderate Stress (n=181)	High Perceived Stress (n=27)	P value
Age				
1. Less than 20	131 (20.4)	11 (6.1)	7 (26)	≤0.05
2. 20–22	451 (70.2)	153 (84.5)	17 (62.9)	
3. More than 22	60 (9.4)	17 (9.4)	3 (11.1)	
Gender				
1. Female	249 (38.8)	89 (49.2)	13 (48.1)	≤0.05
2. Male	393 (61.2)	92 (50.8)	14 (51.9)	
Family Income (Monthly/JOD)				
1. Less than 300	6 (0.90)	9 (5)	6 (22.2)	≤0.05
2. 301–600	511 (79.6)	169 (93.4)	18 (66.7)	
3. More than 600	125 (19.5)	3 (1.6)	3 (11.1)	
Academic Year				
1. First Year	73 (11.4)	16 (8.8)	2 (7.4)	≤0.05
2. Second Year	87 (13.6)	21 (11.6)	6 (22.2)	
3. Third Year	471 (73.4)	87 (48.1)	15 (55.6)	
4. Fourth Year or more	11 (1.6)	57 (31.5)	4 (14.8)	
Academic Specialization				
1. Humanitarian	86 (13.4)	39 (21.5)	16 (59.3)	≤0.05
2. Medical & health related	171 (26.6)	104 (57.5)	6 (22.2)	
3. Engineering and computer related	121 (18.8)	13 (7.2)	2 (7.4)	
4. Social sciences	118 (18.4)	22 (12.2)	2 (7.4)	
5. Other	146 (22.8)	3 (1.7)	1 (3.7)	

Note: * Significant at significance level ($\alpha \leq 0.05$).

The results presented in table (5) showed that there were significant differences in anxiety levels between the enrolled university students referred to their sociodemographic characteristics (age, gender, monthly family income, academic year and specialization). The results showed that university students aged 20 to 22 years had higher prevalence rates of minimal anxiety (81.5%), mild anxiety (56.8%), and moderate anxiety (80.8%). However, severe anxiety was more prevalent among students aged more than 22 years (53.4%). With regard to gender, it was found that minimal anxiety was more prevalent among females (57.1%), whereas mild anxiety (83%), moderate anxiety (80.8) and severe anxiety (93.3%) were more prevalent among male university students. Moreover, it was found that university students having a monthly family income had higher levels of minimal anxiety (80.5%), mild anxiety (87.7%), moderate anxiety (76.7%) and severe anxiety (80%). Furthermore, it was found that third year students had higher prevalence rates of minimal anxiety (63.7%), mild anxiety (75.5%), moderate anxiety (58.9%), and severe anxiety (90%). Finally, medical and health related university students had highest prevalence rates of minimal anxiety (30.7%), mild anxiety (43.1%) and moderate anxiety (24.7%). However, severe anxiety was more prevalent among students from specializations other than those categorized in this study.

Table 5
Prevalence of anxiety among Jordanian university students according to their socio-demographic variables

Variable	Minimal (n=518)	Mild (n=229)	Moderate (n=73)	Severe (n=30)	P value
Age					
1. Less than 20	86 (16.6)	51 (22.3)	8 (11)	4 (13.3)	≤0.05
2. 20–22	422 (81.5)	130 (56.8)	59 (80.8)	10 (33.3)	
3. More than 22	10 (1.9)	48 (21)	6 (8.2)	16 (53.4)	
Gender					
1. Female	296 (57.1)	39 (17)	14 (19.2)	2 (6.7)	≤0.05
2. Male	222 (42.9)	190 (83)	59 (80.8)	28 (93.3)	
Family Income (Monthly/JOD)					
1. Less than 300	12 (2.3)	7 (3.1)	1 (1.4)	1 (3.3)	≤0.05
2. 301–600	417 (80.5)	201 (87.7)	56 (76.7)	24 (80)	
3. More than 600	89 (17.2)	21 (9.2)	16 (21.9)	5 (16.7)	
Academic Year					
1. First Year	40 (7.7)	24 (10.5)	26 (35.6)	1 (3.3)	≤0.05
2. Second Year	103 (19.9)	9 (3.9)	1 (1.4)	1 (3.3)	
3. Third Year	330 (63.7)	173 (75.5)	43 (58.9)	27 (90)	
4. Fourth Year or more	45 (8.7)	23 (10.1)	3 (3.1)	1 (3.3)	
Academic Specialization					
1. Humanitarian	106 (20.5)	23 (10.1)	11 (15.1)	1 (3.3)	≤0.05
2. Medical & health related	159 (30.7)	99 (43.1)	18 (24.7)	5 (16.7)	
3. Engineering and computer related	99(19.1)	21 (9.2)	15 (20.5)	1 (3.3)	
4. Social sciences	87 (16.8)	32 (14)	12 (16.4)	11 (36.7)	
5. Other	67 (12.9)	54 (23.6)	17 (23.3)	12 (40)	

Note: * Significant at significance level ($\alpha \leq 0.05$).

■ DISCUSSION

During the college life most of the students encounters a lot of first encounter in their lives such as exposure to a new learning environment, new teaching strategies used in higher education, new friends, peers with different cultures, and modern lifestyle. These experiences and exposure to a more diverse environment will become a struggle for the students if they cannot manage and cope. These experiences will make them susceptible to stressor that leads to depression, anxiety and stress if it will not be detected and addressed. This condition will affect the student's ability to study, interact with other students and inability perform self-care.

The present study aimed at exploring the prevalence of depression, stress, and anxiety among Jordanian university students and providing updated prevalence rates of these mental health disturbances. A cross-sectional survey was performed over private and public Jordanian universities within different geographical zones in Jordan. The findings of our study showed that there were significant differences in the levels of depression, stress and anxiety between students from public and private universities in Jordan. This result might be attributed to the difference in the sample size and the differences in the quality of the provided educational services provided in both types of universities as more strict and accredited programs are provided in public higher education institutions in Jordan compared to private universities that are still in the beginning of its accreditation process.

Our findings revealed that there is a significant increase in the prevalence rates of depression, anxiety and stress among Jordanian university students compared to previous years. This result might be attributed to that students were experiencing shifting from e-learning situation due to COVID-19 pandemic conditions again to the traditional learning within the university campus, which imposed higher burden, either academic or non-academic, in this period. Increased prevalence rates of depression, anxiety or stress might be attributed to the increased study load, increased efforts and increased requirements needed from Jordanian university students at this stage, especially after this transition from online learning to traditional learning. He results of the present study are consistent with the findings reported by Dwekat et al. (2021) who had reported an increased prevalence of depression and anxiety among Jordanian youth.

The findings of this study revealed that higher depression, stress, and anxiety prevalence rates were among middle aged students, males, middle income category, third year students and students from medical or health related specializations. This result might be attributed to that those students are the age category that started online learning when entering the university and did not practice traditional learning since their beginnings. In addition, this result might be attributed to that medical and health related majoring students are more susceptible to mental health disturbances compared to students from other specializations as evidenced in literature. Further, increased prevalence of depression, stress and anxiety among students from middle income families might be attributed to that this income level is the most prevalent in the country. These findings are consistent with the findings reported by Basheti et al. (2021) who found that depression, anxiety and stress are associated with students' socio-economic factors.

Limitations

Despite the significant findings reported in this study, still there are a number of limitations that could be limiting the generalization of these findings. A significant limitation is the low sample size considered for a nationwide study that explores prevalence of depression, stress and anxiety among university students. In addition, another limitation is the lack of representation of private university students in this study compared to university students from public universities. Moreover, one limitation is not exploring any previous mental health disorders or mental health disturbances that could affect the prevalence of depression, anxiety and stress among university students.

CONCLUSION

The present study concluded that there is a significant increase in the prevalence rates of depression, stress, and anxiety among Jordanian university students compared to the reported previous rates. In addition, this study concluded that increased prevalence rates were among students aged 20 to 22 years, males, students from middle income families, and students from medical or health related specializations. The present study recommends conducting awareness campaigns and interventional programs that aim to increase students' awareness regarding different mental health disturbances and how to adopt different coping strategies. In addition, the present study recommends conducting further cross-sectional studies to assess the prevalence rates of depression, stress and anxiety at different levels and specializations within the Jordanian universities.

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