

Original Research

Understanding Mental Health Needs and Predictors of Anxiety in Emirati Female Students in Higher Education

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Abstract

The prevalence rates of depression, anxiety, and stress range between 5% to 70% globally. Many students experience these mental health conditions as they go through transitional periods in life, such as starting higher education. This study aimed to explore mental health concerns, specifically depression, anxiety, stress, and quality of sleep, in Emirati female university students, a topic that has been understudied in the Middle East. We used the Depression, Anxiety, and Stress Scales (DASS-21) and the Pittsburgh Sleep Quality Index (PSQI) to assess 23 bilingual (Arabic/English) female adolescent Emirati students in the UAE. The data was analyzed using a multiple regression analysis. We found that most participants had normal levels of depression and stress, but over 60% of them had moderate to severe anxiety symptoms. Additionally, a substantial majority reported poor sleep quality. Stress was a significant predictor of anxiety, explaining 53.3% of the variance in anxiety scores. Although other factors influence anxiety, stress seems to be a substantial contributor. This study



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investigates the pervasive issue of anxiety among adolescent Emirati female students, with stress emerging as a major contributing factor. The preliminary findings underscore the imperative for additional research. Our exploration provides a roadmap for a comprehensive evaluation of mental health concerns within this population, offering valuable insights into potential preventive and intervention strategies that warrant further investigation.

Keywords

Mental health; anxiety; depression; stress; sleep; culture

1. Introduction

Poor mental health is considered one of the leading causes of disability worldwide. It affects 450 million people, and one out of four people experience mental disorders during their lifetime [1]. Major depressive disorder (MDD) and anxiety disorders are considered to be among the most prevalent mental health conditions [2, 3]. Depression is characterized by symptoms of persistent low mood and a loss of interest or pleasure, affecting one's ability to perform daily tasks. Additionally, the global prevalence of depression accumulates to 4.4% of the population [1]. Anxiety disorders are hallmarked by feelings of excessive fear and worry. They impair the function of daily activities such as school or job performance and maintaining social relationships. Anxiety affects 3.6% of the population worldwide [1].

Stress can cause or worsen many mental health conditions, like depression and anxiety. Therefore, the interrelationship between stress, anxiety, and depression is complex and multifaceted. Stress may not only trigger mental health conditions but could also be exacerbated by preexisting conditions or cultural factors. Stress happens when we feel that we cannot cope with or handle a situation that is too difficult or demanding for us. This makes us feel threatened and unsafe [4]. Stress is a normal reaction to things that bother us, such as long-lasting poverty (external triggers) or daily challenges at work or in relationships (short-term triggers). Cultural nuances may contribute to stress. For instance, in the context of Emirati female students, societal expectations regarding academic performance or family dynamics could be influential stressors. Stress can affect our body and mind in different ways, such as causing cardiovascular issues, suppressing our immune system, and making us feel angry, tired, or irritable [5].

Depression, anxiety, and stress are commonly reported by young adults when they experience transitional periods in life, such as academic progression, with prevalence rates ranging between 5% and 70% worldwide [6, 7]. Poor mental health tends to be common in university students who are adversely affected by the excessive demands that are placed upon them through their transition into further education [8]. They may experience a range of stressors, including academic issues, conditions of socioeconomic status, relationships with faculty, family, and fellow students, as well as academic and emotional failure [9]. Thus, it is essential to examine mental health in university students, as we know it impacts their academic performance and quality of life and may contribute to substance abuse, academic dishonesty, and decreased empathy [7].

A possible contributing factor to poor mental health is the amount and quality of sleep that university students get. Studies indicate that 71% of college students get less than eight hours of

sleep [10, 11]. Quality of sleep is generally impaired for those suffering from most mental health disorders [12]. Poor sleep quality has been considered a risk factor for depression and anxiety [13, 14]. Alternatively, poor sleep quality may indicate the presence of these mental health conditions [15].

In addition to sleep quality, excessive technology use emerged as another factor contributing to sleep problems among university students [16]. The frequent and prolonged use of digital technologies can disrupt healthy sleep patterns, exacerbating the already challenging issue of insufficient sleep. Notably, depression may also be triggered by real or perceived stress in the social environment [17], and managing technology use becomes integral to mitigating such stressors.

Taken together, young adults in higher education are more vulnerable to mental health conditions such as depression and anxiety and often suffer from poor sleep and stress. A limited number of studies explore mental health among late-adolescent students attending universities in the Middle East and North Africa (MENA) region. Recent studies in the Middle East [18-21] have focused on the mental health of medical students between the ages of 18 and 25 and have shown that stress, anxiety, depression, and poor quality of sleep are common among medical students. Similarly, college students in Qatar and Lebanon show significantly higher rates of depression (34.6%) and anxiety (36.1%) compared with rates in the USA of 12.8% and 15.9%, respectively [22]. Higher rates of moderate depression, estimated to be 22.2%, were also found among female university students in Al-Ain in the United Arab Emirates (UAE) [23]. Fawzy and Hamed [24] have attempted to combine some of the key factors in mental health by investigating levels of depression, anxiety, stress, and sleep in Egyptian medical students. The authors reported high frequencies of anxiety, depression, poor sleep, and stress, with stress ratings being significantly higher compared with depression and anxiety. Nevertheless, the interrelationship between the four dimensions (stress, anxiety, depression, and sleep) was not explored further. A more sophisticated statistical analysis may also allow for important insights into the prediction of illness [25].

One possible explanation for the limited research with a mental health focus in the region is the stigma associated with mental health in the Middle East. Although the area has seen development in terms of education and mental health awareness and has a young and growing field of mental health professionals [26], stigmatizing beliefs, actions, and attitudes toward the treatment of mental illnesses are still prevalent in Arab culture [27]. Stigma and discrimination often lead to a reluctance to seek treatment, which may exacerbate mental health symptomatology [28]. This, in turn, has a negative impact on societal productivity and represents the economic burden of mental health. Figures for the economic costs of mental health in the Middle East have not been reported. However, it was estimated that the global economic costs of mental health are approximately US \$2.5 trillion. The economic impact of mental illness goes beyond direct diagnostic and treatment costs. It is expected that by 2030, this burden will increase to double the amount [29, 30]. Therefore, research on the mental health of university students in the Middle East is of paramount importance.

Additionally, it is crucial to consider the psychosocial and cultural factors that impact mental health. When it comes to Emirati female students, as discussed, family pressures play a significant role. While acknowledging that men also face challenges, our decision to exclusively focus on women is because societal expectations and familial pressures, intertwined with cultural norms, contribute to the unique stressors that these female students face.

Our study addresses a significant gap in the literature by focusing on mental health in the UAE. The present study also highlights the need for mental health awareness among this region's

population. We hypothesized (H1) that adolescent female Emirati students would have slightly higher levels of mental health issues considering cultural and societal influences and (H2) that poor sleep quality would be found in this sample. Furthermore, we hypothesized (H3) that stress would contribute to depression or anxiety among adolescent female Emirati students. To our knowledge, this study is one of the first to examine depression, anxiety, stress, and quality of sleep, as well as their interrelationships in the UAE, with a focus on adolescent Emirati females in higher education. The comprehensive exploration of the relationships between these mental health factors, with consideration of cultural nuances and the stigma associated with mental health, positions the study as a valuable contribution to the existing literature.

2. Materials and Methods

The current study is part of the Comprehensive Characterisation of Well-Being and Mental Health of Students in Higher Education (CCMHHE) project. The project aims to understand mental health needs and find suitable pathways to promote mental health among Emirati female college students. The project explores student populations, including adolescent Emirati women attending a federal university in the UAE. This population is assessed on a range of symptom dimensions and neuropsychological measures. A battery of valid, reliable, and standardized mental health and well-being measures, along with neuropsychological measures, are used to gain a rich account of students in higher education and better understand the UAE population. This project was approved by the Zayed University (ZU) research ethics committee (Ethics application number: ZU19_071_F). The participants provided written informed consent after the study was explained to them through information sheets, and they were reassured regarding their anonymity and confidentiality in the study by the researchers.

2.1 Participants

A total of twenty-three participants were an opportunity sample of Emirati women attending a federal university in the United Arab Emirates (UAE). All participants were recruited from classes typically taken by undergraduate students from the full array of majors offered at the university, such as psychology, arts and digital media, finance, marketing, international affairs, communication and media sciences, education, and information technology. The opportunity sample was chosen due to its practicality and accessibility within the study's constraints. All participants had provided written informed consent after meeting the recruitment criteria. The language of tuition at the institution is English, coupled with the bilingual proficiency of the students in both English and Arabic, which allowed for effective communication during the study and allowed for standardized assessments to be conducted in English. Furthermore, as all participants were majors attending university, they were proficient in English to IELTS level 6. However, some who attended English-speaking primary and secondary schools would have near-native proficiency. The institution, being gender-separated, presented a distinctive context for research, as the female students significantly outnumbered their male counterparts. Furthermore, the timing of classes for male students differed substantially from those of female students, which limited accessibility to male participants. Therefore, it was most feasible to recruit females for the present study. The absence of exclusion criteria for participants was a deliberate choice to enhance the study's representativeness of the

broader higher education students in the UAE. All participants were assessed using measures examining sleep, depression, anxiety, and stress, as described further.

2.2 Materials

The Depression Anxiety Stress Scales-Short Form (DASS-21) [31] was used to measure the participant's levels of depression, anxiety, and stress. The DASS-21 consists of three subscales that examine the severity of depression, anxiety, and stress. Each one of the three subscales includes seven items. The Depression Scale measures dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia, and inertia. The Anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale measures difficulty relaxing, nervous arousal, and being easily upset, agitated, irritable, overreactive, and impatient. If the participant's depression score falls between 0 and 9, it is considered normal. Scores between 10 and 13 suggest mild depressive symptomatology. Scores between 14 and 20 indicate moderate symptoms. Scores between 21 and 27 may indicate the symptomatology of severe depression. A score of 28 or higher indicates the presence of major depressive disorder symptoms (MDD). On the anxiety subscale, a score of 0–7 is considered normal; a score of 8–9 suggests mild symptoms of anxiety. A score of 10–14 suggests moderate symptoms of anxiety, and a score of 15–19 indicates severe anxiety. A score of 20 or higher indicates the presence of symptoms of Generalized Anxiety Disorder (GAD). On the stress subscale, a score of 0–14 is considered normal; a score of 15–18 suggests that the participant is experiencing mild stress levels; a score of 19–25 implies moderate stress levels; and a score of 26–33 implies severe stress levels. A score of 34 or higher implies a high level of stress [31].

The Pittsburgh Quality of Sleep Index (PSQI) [12] was used to assess the quality of sleep, and this scale has good cultural adaptation and acceptable psychometric properties for use in an Arabic population. The PSQI is a standardized sleep questionnaire that consists of 19 items that evaluate an individual's sleep quality based on seven components and one global score comprising subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction over the last month. Each subscale is weighted on a 0–3 interval scale. The global score is calculated by summing up the 7 component scores; a total score of 5 or more indicates poor sleep quality.

2.3 Procedure

All participants in this study provided informed consent, which was obtained through a written consent form explaining the purpose, procedures, and benefits of the research. Prior to participating, participants were given the opportunity to ask questions and seek clarification about the study.

Demographic information was collected from each participant. Age was recorded as a discrete variable, and academic grade was provided using the grade point average format (GPA). Handedness and parental socioeconomic status were determined through a self-report questionnaire with predefined categories. Furthermore, data collection was conducted in a dedicated psychology laboratory designed to minimize distractions and extraneous noise. The laboratory was equipped with comfortable seating, proper lighting, and well-ventilated conditions. Each participant completed the DASS-21 and PSQI scales using printed materials in English. The

scales were presented in a fixed order, and participants were given a brief break between completing each scale. Clear instructions were provided for each scale, and researchers were available to address any questions or concerns the participants might have.

To ensure participant confidentiality, responses were manually recorded on printed scales. All completed materials were assigned unique identification codes to maintain anonymity. The data were then entered into a protected electronic database using SPSS. Any discrepancies or uncertainties during the data collection process were resolved through consultation among the research team.

2.4 Analysis

Descriptive statistics were compiled for age, gender, GPA, parental level of education, and socioeconomic status. Handedness was based on self-report. The parental levels of education ranged from 1 (No formal qualifications) to 4 (Postgraduate). The parents' socioeconomic status was based on self-report and evaluated on a 5-point scale (1 = Lower Class, 2 = Upper Lower Class, 3 = Lower Middle Class, 4 = Upper Middle Class, 5 = Upper Class). Descriptive statistics were also computed for the DASS-21 and the PSQI scales. The data were analyzed using IBM SPSS Statistics (Version 29).

Depression, anxiety, and stress scores on the DASS-21 in the sample were evaluated against the normative scores. Since anxiety levels were found to be in a higher range in our sample (see Results), a multiple regression analysis was conducted to determine whether and how depression, stress, and sleep quality explained anxiety, with anxiety as the dependent variable and depression, stress, and sleep quality as the predictors. It has been suggested that multiple regression analyses should have a minimum of five times as many participants as predictor variables [32]. Here, we have three predictor variables, so our sample of $n = 23$ is acceptable.

Magnitude (R^2 change) was used to determine the contribution of the significant independent variables in the model to the dependent variable (anxiety). Standardized Beta (β) was used to determine the relative influence of each significant predictor in the model on anxiety.

3. Results

The participants were generally in late adolescence ($M = 18.06$, $SD = 0.24$), all of whom were right-handed, and had high semester GPAs ($M = 3.09$, $SD = 0.51$). Four participants reported that their parents had no formal qualifications, while the rest indicated that their parents had a high school, undergraduate, or postgraduate level of education. Only one participant reported that their parent's socioeconomic status was lower class, while the rest fell into the lower, middle and upper middle classes.

The DASS-21 stress ($M = 10.50$, $SD = 4.34$) and depression levels were in the normal range ($M = 9.27$, $SD = 4.88$); however, anxiety levels were in a higher range ($M = 11.09$, $SD = 4.16$). These scores are interpreted within the context of the DASS-21 Scale and were evaluated against normative scores, where a normal range for depression is considered to be between 0-4, for anxiety 0-3, and for stress 0-7 [31]. Participants also suffered from poor sleep quality ($M = 8.30$, $SD = 2.35$), as shown by their PSQI scores (a global score of 5 or higher is equivalent to poor sleep). PSQI includes a scoring key for calculating a patient's score on the seven subscales. We found that participants scored in the midrange for all 7 subscales (see Table 1).

Table 1 Sample Demographics and Mental Health Characteristics.

| Demographic Characteristics | Mean | Std. Deviation |
|---|-------|----------------|
| Age in years | 18.06 | 0.24 |
| Student Semester GPA | 3.09 | 0.51 |
| Clinical Characteristics | Mean | Std. Deviation |
| Depression (DASS-21) | 9.27 | 4.88 |
| Anxiety (DASS-21) | 11.09 | 4.16 |
| Stress (DASS-21) | 10.50 | 4.34 |
| Total Sleep Quality (PSQI) | 8.30 | 2.35 |
| PSQI subscale - Subjective Sleep Quality | 1.41 | 0.73 |
| PSQI subscale - Sleep Latency | 1.73 | 1.24 |
| PSQI subscale - Sleep Duration | 1.05 | 1.09 |
| PSQI subscale - Habitual Sleep Efficiency | 0.62 | 0.32 |
| PSQI subscale - Sleep Disturbances | 1.59 | 0.73 |
| PSQI subscale - Use of Sleep Medications | 0.41 | 0.95 |
| PSQI subscale - Daytime Dysfunction | 1.50 | 0.85 |

The frequency of symptom scores for depression, anxiety, and stress in Emirati female students is shown in Figure 1. The severity of stress levels ranged from normal to mild for most participants. The majority of the sample (78.26%) scored in the normal range for depression, with none scoring in the moderate range. Anxiety was observed at all the different severity levels, with most of our participants (60.87%) scoring in the moderate or severe range (Figure 1).

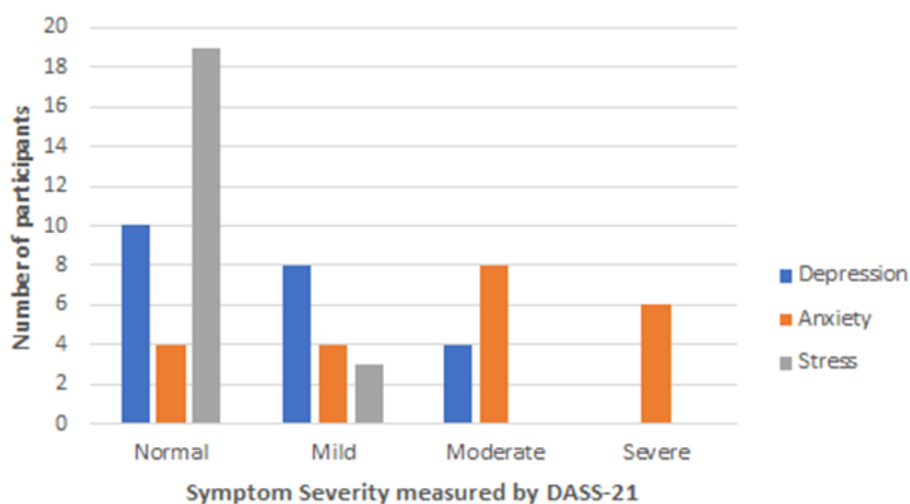


Figure 1 Symptom severity in depression, anxiety, and stress in Emirati students.

The statistical analysis was conducted through SPSS, where the model's significance was evaluated through an F-test, with beta coefficients representing the strength and direction of each variable's contribution. In the multiple regression analysis, anxiety served as the dependent variable, and factors such as depression, stress, and sleep quality were examined. The results indicated a significant model, as evidenced by $F(3,18) = 6.845$, $p = 0.033$, explaining 53.3% of the variance in anxiety. $R^2 = 0.533$, which determines the proportion of variance in the dependent

variable, and the corresponding effect size (f^2) = 1.14132762, indicative of a large effect [33]. Stress made a significant contribution to the change in anxiety scores (β = 0.731; p = 0.0001), and quality of sleep showed a trend towards significance (β = 0.347; p = 0.051). However, depression had a non-significant influence (β = -0.259; p = 0.158).

In brief, the study was conducted on late-adolescent participants with right-handedness and high semester GPAs. Most of the participants' parents had high educational levels and fell into either the lower-middle or upper-middle classes. Participants reported higher anxiety levels. Poor sleep quality played a major role, with participant scores falling into the midrange across seven subscales. Many Emirati female students showed normal to mild stress levels and normal ranges for depression. On the other hand, anxiety varied across severity levels, ranging from moderate to severe. A multiple regression analysis revealed that stress significantly contributed to anxiety, followed by sleep quality, while depression did not significantly influence the outcomes.

4. Discussion

The present study, to our knowledge, is the first to examine mental health and the relationship between anxiety, depression, stress, and sleep in a sample of late adolescent female Emirati students in higher education in the UAE. The findings showed that, as hypothesized (H1), adolescent female Emirati students had slightly higher levels of mental health issues. Depression and stress levels were within the normal range for most participants; however, over 60% of the sample reported moderate-to-severe anxiety symptoms. Similarly, hypothesis two was supported; a large percentage of the participants (95%) reported poor quality of sleep. Finally, in line with our hypothesis (H3), stress was found to contribute significantly to anxiety, explaining 53.3% of the variance.

Our findings of higher levels of anxiety and poor sleep are consistent with those from the MENA region, which have focused on the mental health of medical students [18-21]. Most studies in the MENA region focus on medical students, and there is evidence that this specific population of students has rates of depression and suicide that are much higher than those of the general population [34]. In contrast, our study explored mental health among university students studying different majors other than the medical field. Similar results were found in a study that is more comparable to ours in a Malaysian university student sample pursuing various fields of study [35]. Similar to the present study, Shamsuddin and colleagues [35] utilized the DASS-21 scale to explore possible correlates of depression, stress, and anxiety. Their results indicated that the prevalence of anxiety is much higher than that of depression and stress. Additionally, our results offer insights into the prediction of anxiety, revealing the importance of stress in the potential onset of anxiety [36, 37].

Gender could be considered as a factor influencing stress and anxiety. Female students tend to experience higher levels of stress in comparison to their male counterparts [38-40]. In line with our study, there are similar reports of anxiety being more prevalent in female students [41]. A study conducted by Sehlo et al. [42] found higher levels of stress in female students in Saudi Arabia. They found one main significant predictor, which is poor peer group support. This predictor of stress could be explained by cultural factors such as parental attitudes towards their daughters and parental restrictions that make it harder for female students to communicate with their friends [42] easily. This cultural factor could explain the results of our study since Saudi Arabia and the UAE share

similar collectivist, conservative cultures. Therefore, the restriction of limited peer group support could lead to stress and anxiety in our sample.

Indeed, mental health needs to be examined in the context of the person's cultural, racial, and ethnic background, as there are culture-specific expressions of anxiety; for instance, *Taijin Kyofusho* is a Japanese culture-specific anxiety disorder [43]. Additionally, collectivistic cultures, in contrast to individualistic cultures, are found to have a more positive attitude towards socially avoidant behaviors, which increases levels of disorders such as social anxiety [44]. This could help explain the high levels of anxiety found in our Emirati sample. Other possible factors contributing to stress could be academic performance, social performance, financial issues, high parental standards, and the pressure of exams [38].

In addition, our participants' results indicate poor quality of sleep, although sleep only showed a trend towards significance in predicting anxiety. Poor sleep quality may indicate the presence of a mental health condition such as an anxiety disorder [26, 45-47]. Studies suggest that 71% of college students get less than eight hours of sleep [10, 11], which has been linked with anxiety [48, 49]. Females tend to be more susceptible to the adverse effects of sleep disturbances, which is due to various factors such as engagement in multiple social roles and cycling hormones [50]. The Sleep Anxiety Performance Process (SAPP) [51] model states that sleep and anxiety contribute to one another in a reciprocal process, which results in the impairment of academic performance and student mental health. This model explains our findings and suggests that poor sleep and stress could be predictors of anxiety.

Anxiety and stress have intertwined neural underpinnings and a bidirectional relationship. Studies have demonstrated that stress leads to or increases levels of anxiety [52]. It has been stated that the neurobiology of specific anxiety disorders is primarily unclear; however, few characteristics have been discovered, such as limbic system disturbances, hypothalamic-pituitary-adrenal axis abnormalities, and hereditary factors [53]. Animal models illustrate the association between anxiety, stress, and various brain regions. The brain regions affected by anxiety and stress include the medial prefrontal cortex, locus coeruleus, basolateral amygdala, and reward-processing areas such as the nucleus accumbens [54-56]. The fact that both stress and anxiety are controlled by interconnected neural circuitry implies a significant relationship between these two dimensions of mental health.

Consequently, the bidirectional relationship between stress and anxiety may contribute to the etiology of anxiety-related disorders such as post-traumatic stress disorder and social anxiety disorder [54]. However, most of the studies exploring the relationship between anxiety and stress are conducted on animal models. Additionally, there is a scarcity of studies that highlight stress as a predictor of anxiety in the female Emirati population. Therefore, our research using a non-clinical human sample of female Emiratis could be the basis for future studies, which may include neuroimaging. This type of investigation could shed light on the predictors of anxiety disorders, help us better understand neuropsychopathology, and aid in early diagnosis.

Our findings could be used to inform early diagnosis, intervention/treatment, and prevention strategies for the student population. Knowledge of risk indicators of anxiety disorders allows for early diagnosis and the use of preventative measures [57]. Early diagnosis is essential as it impacts the rate at which individuals seek help. A recent study [58] found that individuals who have received an anxiety diagnosis were 3.19 times more likely to seek help in comparison to those who have not received a diagnosis. Early intervention, treatment, and prevention efforts for anxiety in the UAE

could be facilitated using the findings from our study. Identifying individuals at risk for a disorder in various age groups and focusing on early signs or non-clinical levels of anxiety symptoms has proven successful previously [59]. In addition, being female, as well as having a familial history of anxiety, are also known risk factors for anxiety disorders [53]. Moreover, this could further promote the creation of appropriate targeted interventions in a primary healthcare or university setting to prevent levels of anxiety from transitioning into a clinical disorder.

Our study not only sheds light on the risk indicators and early intervention strategies for anxiety among university students in the UAE but also highlights the critical intersection between mental health and academic success. Students' achievement in higher education is intricately tied to their overall life satisfaction [60]. Notably, our findings emphasize the importance of providing additional support for Emirati students, recognizing their unique needs, and developing self-efficacy and stress management skills to navigate the challenges of higher education [60]. Recognizing that both genders may face distinct challenges and differences in stress and self-efficacy levels. It is essential to tailor effective support systems that promote academic and mental well-being for both male and female Emirati students. Educational institutions can foster an environment that supports students and their mental health by integrating our insights into preventative measures and early interventions.

Additionally, findings from a related study [61] indicate that supportive teaching positively correlates with students' well-being across diverse cultural contexts. This includes educators adopting strategies such as providing choice, giving structure, and demonstrating affection [61]. This recommendation resonates with our emphasis on fostering a supportive academic environment. This holistic approach will contribute to students' educational pursuits and overall well-being, ensuring a comprehensive support system for university students in the UAE.

4.1 Methodological Considerations

This study has several significant methodological contributions, including the use of a non-clinical, UAE national and drug-free sample and examining multiple mental health dimensions. By using various dimensions of mental health, our approach offers a comprehensive understanding of the unique challenges Emirati female students face in higher education. Despite the substantial contributions, it is important to acknowledge the study's limitations, including the small sample size and lack of male participants, which inhibit any direct inferences being made about the generalizability of the findings to a larger UAE student population. Furthermore, other limitations to consider are the possibility of social desirability bias as the data has been self-reported, which might affect the participants' responses. Future research may benefit from employing more rigorous sampling techniques to enhance the external validity and generalizability of findings. Despite these limitations, this study contributes valuable insights into the mental health patterns of Emirati women attending higher education.

Additionally, this preliminary study provides a roadmap for future research, which can include both genders and go beyond the core mental health dimensions we have examined. Future studies should include sociodemographic and cultural factors that may impact anxiety and/or stress. This expansion will enrich our understanding of the nuanced interplay between mental health and diverse contextual influences. Our study not only highlights the prevalence of mental health

challenges among Emirati female students but also advocates for a proactive stance through early detection, diagnosis, and intervention research.

5. Conclusion

Mental health is a crucial topic for university students, as it affects their academic achievement, well-being, and other aspects of academic and social functioning [7]. Our study reveals the high prevalence of anxiety among Emirati female students and the significant role of stress. These findings emphasize the critical need for proactive measures in mental health care. As discussed, our findings justify further exploration of mental health dimensions and potential predictors of mental health, which could help with early detection, intervention, and treatment of mental health problems. Especially ones tailored to the unique challenges faced by this demographic and Emiratis in general. Intervention research can capitalize on our findings to design and implement effective support programs, including stress management workshops and culturally sensitive counseling services. Integrating these resources into an academic environment would create a holistic approach to mental health. Moreover, insights gained from our research can inform the development of diagnostic tools that go beyond generic assessments. Clinicians can enhance the precision of their diagnoses, ensuring that the interventions are tailored to the specific needs and experiences of Emirati female and male students.

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Author Contributions

JJ and VK contributed to designing the study. FA, SA, AS, JJ, and VK contributed to data collection. FA, SA, AS, JJ, and VK contributed to data analysis. FA, SA, AS, JJ, and VK contributed to writing the original manuscript. All authors revised the paper and approved the final revision.

Competing Interests

The authors have no funding to disclose. The authors report there are no financial conflicts of interest or competing interests to declare.

References

1. Sayers J. The world health report 2001-Mental health: New understanding, new hope. *Bull World Health Organ.* 2001; 79: 1085.
2. Richards D. Prevalence and clinical course of depression: A review. *Clin Psychol Rev.* 2011; 31: 1117-1125.
3. James SL, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: A systematic analysis for the global burden of disease study 2017. *Lancet.* 2018; 392: 1789-1858.

4. Taniguchi A, Mizuno M. Psychological stress and coping in recently discharged postsurgical cancer patients. *Asia Pac J Oncol Nurs*. 2016; 3: 176-182.
5. Sharma DK. Physiology of stress and its management. *J Med Stud Res*. 2018; 1: 001.
6. Beiter R, Nash R, McCrady M, Rhoades D, Linscomb M, Clarahan M, et al. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *J Affect Disord*. 2015; 173: 90-96.
7. January J, Madhombiro M, Chipamaunga S, Ray S, Chingono A, Abas M. Prevalence of depression and anxiety among undergraduate university students in low-and middle-income countries: A systematic review protocol. *Syst Rev*. 2018; 7: 57.
8. Dias Lopes LF, Chaves BM, Fabrício A, Porto A, Machado de Almeida D, Obregon SL, et al. Analysis of well-being and anxiety among university students. *Int J Environ Res Public Health*. 2020; 17: 3874.
9. Ibrahim AK, Kelly SJ, Adams CE, Glazebrook C. A systematic review of studies of depression prevalence in university students. *J Psychiatr Res*. 2013; 47: 391-400.
10. Lund HG, Reider BD, Whiting AB, Prichard JR. Sleep patterns and predictors of disturbed sleep in a large population of college students. *J Adolesc Health*. 2010; 46: 124-132.
11. Khayat MA, Qari MH, Almutairi BS, Shuaib BH, Rambo MZ, Alrogi MJ, et al. Sleep quality and internet addiction level among university students. *Egypt J Hosp Med*. 2018; 73: 7042-7047.
12. Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Res*. 1989; 28: 193-213.
13. O'Leary K, Bylsma LM, Rottenberg J. Why might poor sleep quality lead to depression? A role for emotion regulation. *Cogn Emot*. 2017; 31: 1698-1706.
14. Narmandakh A, Roest AM, de Jonge P, Oldehinkel AJ. The bidirectional association between sleep problems and anxiety symptoms in adolescents: A TRAILS report. *Sleep Med*. 2020; 67: 39-46.
15. Hamilton NA, Gallagher MW, Preacher KJ, Stevens N, Nelson CA, Karlson C, et al. Insomnia and well-being. *J Consult Clin Psychol*. 2007; 75: 939-946.
16. Tülübaş T, Karakose T, Papadakis S. A holistic investigation of the relationship between digital addiction and academic achievement among students. *Eur J Investig Health Psychol Educ*. 2023; 13: 2006-2034.
17. Qassim SU, Boura F, Al-Hariri Y. Public knowledge and attitude toward depression and schizophrenia: Findings from quantitative study in UAE. *Asian J Pharm Clin Res*. 2018; 11: 402-406.
18. Mirghani HO, Mohammed OS, Almutadha YM, Ahmed MS. Good sleep quality is associated with better academic performance among Sudanese medical students. *BMC Res Notes*. 2015; 8: 706.
19. Hangouche AJ, Jniene A, Abouddrar S, Errguig L, Rkain H, Cherti M, et al. Relationship between poor quality sleep, excessive daytime sleepiness and low academic performance in medical students. *Adv Med Educ Pract*. 2018; 9: 631-638.
20. Gomathi KG, Ahmed S, Sreedharan J. Psychological health of first-year health professional students in a medical university in the United Arab Emirates. *Sultan Qaboos Univ Med J*. 2012; 12: 206-213.

21. Mohammadbeigi A, Absari R, Valizadeh F, Saadati M, Sharifimoghadam S, Ahmadi A, et al. Sleep quality in medical students; the impact of over-use of mobile cellphone and social networks. *J Res Health Sci.* 2016; 16: 46-50.
22. Kronfol Z, Khalifa B, Khoury B, Omar O, Daouk S, Dewitt JP, et al. Selected psychiatric problems among college students in two Arab countries: Comparison with the USA. *BMC Psychiatry.* 2018; 18: 147.
23. Mellal A, Albluwe TA, Al-Ashkar DA. The prevalence of depressive symptoms and its socioeconomic determinants among university students in Al Ain, UAE. *Int J Pharm Pharm Sci.* 2014; 6: 309-312.
24. Fawzy M, Hamed SA. Prevalence of psychological stress, depression and anxiety among medical students in Egypt. *Psychiatry Res.* 2017; 255: 186-194.
25. Jeon J. The strengths and limitations of the statistical modeling of complex social phenomenon: Focusing on SEM, path analysis, or multiple regression models. *Int J Econ Manage Eng.* 2015; 9: 1634-1642.
26. Karamustafaloğlu O. Major depressive disorder, mental health care, and the use of guidelines in the middle east. *J Clin Psychiatry.* 2010; 71: 27766.
27. Zolezzi M, Alamri M, Shaar S, Rainkie D. Stigma associated with mental illness and its treatment in the Arab culture: A systematic review. *Int J Soc Psychiatry.* 2018; 64: 597-609.
28. Ashwood JS, Briscoe B, Collins RL, Wong EC, Eberhart NK, Cerully J, et al. Investment in social marketing campaign to reduce stigma and discrimination associated with mental illness yields positive economic benefits to California. *Rand Health Q.* 2017; 6: 5.
29. Rice KG, Leever BA, Christopher J, Porter JD. Perfectionism, stress, and social (dis) connection: A short-term study of hopelessness, depression, and academic adjustment among honors students. *J Couns Psychol.* 2006; 53: 524-534.
30. Trautmann S, Rehm J, Wittchen HU. The economic costs of mental disorders: Do our societies react appropriately to the burden of mental disorders? *EMBO Rep.* 2016; 17: 1245-1249.
31. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. *Behav Res Ther.* 1995; 33: 335-343.
32. Brace N, Kemp R, Snelgar R. *SPSS for psychologists.* London, UK: Palgrave Macmillan; 2012.
33. Cohen J. *Statistical power analysis.* *Curr Dir Psychol Sci.* 1992; 1: 98-101.
34. Givens JL, Tjia J. Depressed medical students' use of mental health services and barriers to use. *Acad Med.* 2002; 77: 918-921.
35. Shamsuddin K, Fadzil F, Ismail WS, Shah SA, Omar K, Muhammad NA, et al. Correlates of depression, anxiety and stress among Malaysian university students. *Asian J Psychiatr.* 2013; 6: 318-323.
36. Heinen I, Bullinger M, Kocalevent RD. Perceived stress in first year medical students-associations with personal resources and emotional distress. *BMC Med Educ.* 2017; 17: 4.
37. Jones PJ, Park SY, Lefevor GT. Contemporary college student anxiety: The role of academic distress, financial stress, and support. *J Coll Couns.* 2018; 21: 252-264.
38. Pourrajab M, Rabbani M, Kashmaeinezhadfard S. Different effects of stress on male and female students. *Online J Couns Educ.* 2014; 3: 31-39.
39. Mazumdar H, Gogoi D, Buragohain L, Haloi N. A comparative study on stress and its contributing factors among the graduate and post-graduate students. *Adv Appl Sci Res.* 2012; 3: 399-406.

40. Abdulghani HM, AlKanhil AA, Mahmoud ES, Ponnampereuma GG, Alfaris EA. Stress and its effects on medical students: A cross-sectional study at a college of medicine in Saudi Arabia. *J Health Popul Nutr.* 2011; 29: 516-522.
41. Wahed WY, Hassan SK. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. *Alexandria J Med.* 2017; 53: 77-84.
42. Sehlo MG, Al-Zaben FN, Khalifa DA, Agabawi AK, Akel MS, Nemri IA, et al. Stress among medical students in a college of medicine in Saudi Arabia: Sex differences. *Middle East Curr Psychiatry.* 2018; 25: 150-154.
43. Hofmann SG, Anu Asnaani MA, Hinton DE. Cultural aspects in social anxiety and social anxiety disorder. *Depress Anxiety.* 2010; 27: 1117-1127.
44. Heinrichs N, Rapee RM, Alden LE, Bögels S, Hofmann SG, Oh KJ, et al. Cultural differences in perceived social norms and social anxiety. *Behav Res Ther.* 2006; 44: 1187-1197.
45. Kalmbach DA, Abelson JL, Arnedt JT, Zhao Z, Schubert JR, Sen S. Insomnia symptoms and short sleep predict anxiety and worry in response to stress exposure: A prospective cohort study of medical interns. *Sleep Med.* 2019; 55: 40-47.
46. Choueiry N, Salamoun T, Jabbour H, El Osta N, Hajj A, Rabbaa Khabbaz L. Insomnia and relationship with anxiety in university students: A cross-sectional designed study. *PLoS One.* 2016; 11: e0149643.
47. Silva VM, Magalhaes JE, Duarte LL. Quality of sleep and anxiety are related to circadian preference in university students. *PLoS One.* 2020; 15: e0238514.
48. Nyer M, Farabaugh A, Fehling K, Soskin D, Holt D, Papakostas GI, et al. Relationship between sleep disturbance and depression, anxiety, and functioning in college students. *Depress Anxiety.* 2013; 30: 873-880.
49. Becker SP, Jarrett MA, Luebke AM, Garner AA, Burns GL, Kofler MJ. Sleep in a large, multi-university sample of college students: Sleep problem prevalence, sex differences, and mental health correlates. *Sleep Health.* 2018; 4: 174-181.
50. Lee SY, Wuertz C, Rogers R, Chen YP. Stress and sleep disturbances in female college students. *Am J Health Behav.* 2013; 37: 851-858.
51. Hamilton N, Freche R, Zhang Y, Zeller G, Carroll I. Test anxiety and poor sleep: A vicious cycle. *Int J Behav Med.* 2021; 28: 250-258.
52. Manzar MD, Salahuddin M, Pandi-Perumal SR, Bahammam AS. Insomnia may mediate the relationship between stress and anxiety: A cross-sectional study in university students. *Nat Sci Sleep.* 2021; 13: 31-38.
53. Craske MG, Stein MB, Eley TC, Milad MR, Holmes A, Rapee RM, et al. Correction: Anxiety disorders. *Nat Rev Dis Primers.* 2017; 3: 17024. doi: 10.1038/nrdp.2017.100.
54. Daviu N, Bruchas MR, Moghaddam B, Sandi C, Beyeler A. Neurobiological links between stress and anxiety. *Neurobiol Stress.* 2019; 11: 100191.
55. Shin LM, Liberzon I. The neurocircuitry of fear, stress, and anxiety disorders. *Neuropsychopharmacology.* 2010; 35: 169-191.
56. Lowery-Gionta EG, Crowley NA, Bukalo O, Silverstein S, Holmes A, Kash TL. Chronic stress dysregulates amygdalar output to the prefrontal cortex. *Neuropharmacology.* 2018; 139: 68-75.
57. Van Oort FV, Greaves-Lord K, Ormel J, Verhulst FC, Huizink AC. Risk indicators of anxiety throughout adolescence: The TRAILS study. *Depress Anxiety.* 2011; 28: 485-494.

58. Barbato M, Al Hemeiri S, Nafie S, Dhuhair BA, Dabbagh NT. Characterizing individuals accessing mental health services in the UAE: A focus on youth living in Dubai. *Int J Ment Health Syst.* 2021; 15: 29.
59. Craske MG. *Anxiety disorders: Psychological approaches to theory and treatment.* Boulder, CO: Westview Press; 1999.
60. Hitches E, Woodcock S, Ehrich J. Building self-efficacy without letting stress knock it down: Stress and academic self-efficacy of university students. *Int J Educ Res Open.* 2022; 3: 100124.
61. Wang Y, King RB, Wang F, Leung SO. Need-supportive teaching is positively associated with students' well-being: A cross-cultural study. *Learn Individ Differ.* 2021; 92: 102051.