Original Research

Measuring depression and anxiety prevalence among Iraqi healthcare college students using hospital anxiety and depression scale

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Abstract

Objective: The study aimed to 1) measure the prevalence of depression and anxiety among Iraqi pharmacy and medical students at a number of universities in Baghdad using Hospital Anxiety and Depression Scale (HADS) and 2) investigate the association between various sociodemographic factors and students’ HADS scores.

Methods: This study was based on a cross-sectional descriptive design in four universities in Baghdad, Iraq. Depression and anxiety were screened using an Arabic version of the HADS. An online survey was administered via Qualtrics to convenience samples of students at four colleges of pharmacy and a college of medicine between March and June 2018. Multiple linear regression was used to identify factors associated with depression and anxiety symptoms among the participants.

Results: The researchers received 750 usable surveys. The participating students spent more time browsing social media (6.64 hours/day) than studying (1.92 hours/day) and exercising (2.83 hours/week). Approximately forty-six percent (45.9%) of the participants had scores that indicated depression symptoms and one-quarter (24.8%) had scores that indicated depression borderline symptoms. More than one-half (52.1%) of the participants had scores that indicated anxiety symptoms, while 20.1% had scores that indicated anxiety borderline symptoms. According to the multiple linear regression analysis, more depression and anxiety symptoms were significantly (p-value <0.05) associated with higher study hours weekly and lower sleep hours at night, academic achievement, and colleagues and family social support during exams.

Conclusions: Pharmacy and medical students may be vulnerable to depression and anxiety because of long study hours. To reduce their levels of anxiety and depression, they may need more social support, more exercise, more sleep, less social media use and a lower academic workload.

Keywords: Depression; Anxiety; Anxiety Disorders; Students, Medical; Students, Pharmacy; Academic Success; Sleep; Exercise; Social Support; Workload; Prevalence; Linear Models; Cross-Sectional Studies; Iraq

INTRODUCTION

Depression and anxiety are serious health conditions that affect increasing numbers of people globally. Depression is characterized by sadness, loss of interest or pleasure, feeling of guilty or low self-worth, disturbed sleep or appetite, feeling of tiredness and poor concentration, while anxiety patients present with a feeling of anxiety and fear. According to the 2017 World Health Organization (WHO) report, nearly 322 million people (4.4%) worldwide live with depression and about 264 million people (3.6%) globally live with anxiety. According to a recent Iraqi Ministry of Health (MOH) report, 16.5% of Iraqi people older than 15 years of age suffer from psychological diseases. In 2015, the prevalence of depression and anxiety in the Eastern Mediterranean Region was 9% and 10%, respectively. Depression affects nearly 10.9% of individuals aged 18-25 years, which is a key population segment in each society as it primarily constitutes college students. It is noteworthy that depression can lead to suicide which is the second leading cause of death in young adults (15-29 year old) globally.

A recent meta-analysis (2019) included 69 studies comprising 40,348 medical students found the highest prevalence of anxiety was in the Middle East (42%). A study in Egypt found that 30.3% of 164 pharmacy students experienced moderate to severe anxiety symptoms. In a WHO report that surveyed international college students at 19 colleges across 8 countries (Australia, Belgium, Germany, Mexico, Northern Ireland, South Africa, Spain, United States), about 35% of first-year college students reported mental health disorders. A systematic review of data from 195 countries over 27 years found that depression ranks the largest contributor to health loss for both sexes globally. Moreover, nearly 50% of people with depression do not receive adequate treatment. To highlight this global expanding condition, the WHO launched a campaign called “Depression: Let’s Talk” in 2017 to help people with depression get help worldwide. In Iraq, the prevalence rates were estimated at 3.7% for depression and 4.5% for anxiety. Although there are many studies of medical students’ mental health, there is little research evaluating mental health in pharmacy students. One study in the United States (U.S.) including students of five healthcare colleges found that 19.4% of the participants had social isolation.
This study found that interpersonal (relationships with faculty and other students), and organization (university/college requirement) factors can be associated with student social isolation. Studies have shown that the prevalence of depression among pharmacy students ranges from as low as 22.6% (in Malaysia) to as high as 51.5% (in Egypt). Factors accounting for a higher prevalence of depression among pharmacy students include age related factors, stressors specific to the educational environment, and daily life stressors. The potential consequences of these psychological problems on pharmacy students at the personal and professional levels include increased difficulty with classroom learning, deteriorating healthcare practice, increasing the likelihood of prescription errors, and lower quality of patient care.

Table 1. The characteristics of the participating students

| Characteristics | N   | %   | Item                                | N   | %   |
|-----------------|-----|-----|-------------------------------------|-----|-----|
| Age (years)     |     |     | Sleep hours during night            |     |     |
| 19              | 78  | 11.8| 1-4.5                               | 84  | 12.3|
| 20              | 144 | 21.9| 5                                   | 214 | 31.4|
| 21              | 185 | 28.1| 6                                   | 175 | 25.7|
| 22              | 128 | 19.4| 7                                   | 80  | 11.7|
| 23              | 93  | 14.1| 8                                   | 36  | 5.3 |
| 24 and more     | 31  | 4.7 | 9-12.0                              | 19  | 2.8 |
| Total           | 659 | 100.0 | Total                              | 682 | 100.0|
| Gender          |     |     | Sleep time                          |     |     |
| Male            | 171 | 25.9| 10-10:45 PM                         | 45  | 6.6 |
| Female          | 488 | 74.1| 11-11:45 PM                         | 103 | 15.1|
| College year    |     |     | Total                               |     |     |
| 1st             | 29  | 4.4 | Total                               | 683 | 100 |
| 2nd             | 105 | 16.0| Study Schedule                      |     |     |
| 3rd             | 196 | 29.9| Daily                               | 156 | 22.8|
| 4th             | 196 | 29.9| Weekly                              | 234 | 34.2|
| 5th             | 129 | 19.7| Before exam only                    | 294 | 43.0|
| College name    |     |     | Total                               |     |     |
| Pharmacy/ Baghdad| 340  | 51.7| Study hours weekly                  | 215  | 32.7|
| Pharmacy/ Yarmouk| 44  | 6.7 | 0-5                                 | 165  | 25.1|
| Pharmacy/ Assool Al-Deen | 61  | 9.3 | 6-10.0                              | 73   | 11.1|
| Pharmacy/ Nahrain | 99  | 15.0| 11-15.0                             | 62   | 9.4 |
| Medical/ Nahrain | 110 | 16.7| 15-20                               | 65   | 9.9 |
| Others          | 6   | 0.9 | 21-28                               | 77   | 11.7|
| Total           | 658 | 100.0| Total                               | 657 | 100.0|
| Marital status  |     |     | Academic achievement                |     |     |
| Single          | 606 | 92.1| Fair                                | 150  | 21.9|
| Married         | 21  | 3.2 | Medium                              | 267  | 39.0|
| Engaged         | 31  | 4.7 | Good                                | 213  | 31.1|
| Paid job        |     |     | Very Good                           | 54   | 7.9 |
| Yes             | 55  | 8.3 | Total                               | 684  | 100.0|
| No              | 606 | 91.7| Missed classes                      |     |     |
| Total           | 661 | 100.0| Total                               | 685  | 100.0|
| Chronic disease/ disability |     |     | Daily                               | 95   | 13.9|
| No              | 603 | 91.2| Weekly                              | 180  | 26.3|
| Yes             | 58  | 8.8 | Rare                                | 325  | 47.4|
| Total           | 661 | 100.0| Total                               | 688  | 100.0|
| Lost parent     |     |     | Smoke hookah                        |     |     |
| No              | 588 | 89.0| Yes                                 | 58   | 8.4 |
| Yes             | 73  | 11.0| No                                 | 630  | 91.6|
| Total           | 661 | 100.0| Total                               | 688  | 100.0|
Methods

This was a cross-sectional descriptive study that was conducted in four universities (two public and two private) in Baghdad, Iraq. A web-based self-reported survey was administered to pharmacy and medical students. The electronic survey was administered through Qualtrics Survey Software (Qualtrics, Inc, Provo, UT). The survey link was distributed electronically via Facebook groups (closed groups for academic purposes) to a convenience sample of students at four colleges of pharmacy and a college of medicine between March 11 and June 4, 2018. The authors reached out to faculty members at different universities/colleges to distribute the survey link among their student groups. Additionally, final-year pharmacy students helped to distribute the survey on their class Facebook closed (academic) group(s).

Depression and anxiety were measured using the HADS questionnaires, which is a valuable tool utilized by many studies for this purpose. The HADS scale was used because it is validated tool that can measure both depression and anxiety symptoms even in apparently healthy subjects. In 2014, the HADs scale was validated to detect anxiety and anxiety symptoms among a large sample of French employees from 16 large companies.14 Additionally, a recent (2019) master thesis from Cardiff University School of Medicine, Philosophy Department confirmed that the HADs is appropriate tool for measuring anxiety and depression in medical students.15 The HADs four-point scales were used to answer the survey questionnaires (0-normal, 1-mild symptoms, 2- moderate symptoms, 3-severe symptoms).

The survey included 28 demographic items and 14 HADS items. At the end of the survey, sociodemographic information was collected from the students including age, gender, social status, year of study, name of the university, academic achievement, smoking cigarette/hookah, lost parent and having chronic disease/disability. The participants were also asked about the different life activities (sport, religious, social, going out, having professional plan, study hours, sleep hours, TV watching, social media browsing, and types of social media used). The survey also included two questions about receiving social support from family and friends. The items had categorical answers except some questions needed to type numbers such as the hours spent for study, sleep, social media browsing and social activities. An expert in Social and Administrative Pharmacy (with 37 published peer-reviewed studies in the field) developed the demographic and activity questions.

The survey was pretested (pilot study) during February 2018 to evaluate the clarity of demographic and social activity items. To avoid any language barrier, the instructions and all survey items were translated into Arabic. No incentives were offered. The survey was optional and anonymous. This study proposal was approved by Ethical Committee at University of Baghdad College of Pharmacy.

Statistical analyses

The analyses were conducted using the SPSS version 22, (IBM, New York, USA). Means, ranges, standard deviations (SD), frequencies and percentages of participant characteristics were calculated. The reliability analyses of both depression (7 items) and anxiety scales (7 items) were measured using Cronbach’s alpha as indicator of internal consistency. Multiple linear regression was used to identify the factors associated with of depression and anxiety symptoms among the participants. The independent

| Table 2. Different social activities of the participating students |
|------------------------|--------|------|
| Item                   | N     | %    |
| Social Activities      |       |      |
| Sport                  | 210   | 25.3 |
| Visit friends and relatives | 196   | 23.6 |
| Visit Religious places | 91    | 11.0 |
| Go out with family and friends | 334   | 40.2 |
| Total                  | 831   | 100.0|
| Family support during exams |     |      |
| No                     | 85    | 12.9 |
| Sometimes              | 252   | 38.1 |
| Always                 | 324   | 49.0 |
| Total                  | 661   | 100.0|
| Have a clear plan for professional goals |     |      |
| No                     | 342   | 51.8 |
| Yes                    | 318   | 48.2 |
| Total                  | 660   | 100.0|
| Mean (STDEV)           |       |      |
| Sleep hours/night      | 5.50  | 1.5  |

Figure 1. The distribution of students’ sleep hours during night

| Table 3. The average hours of student activities per week |
|------------------------|--------|------|
| Activities             | hours  |
| Watch TV               | 3.17   |
| Browsing Facebook      | 22.97  |
| Sport                  | 2.83   |
| Study                  | 13.46  |
| Go out with family/friends | 3.76  |
| Visits friends/relatives | 3.01  |
| Religious activities   | 1.3    |

| Table 4. students using each social media application and hours of social media browsing per day |
|-----------------------------------------------|--------|------|
| Social media | Student users (%) | Daily hours |
| Facebook     | 81.7           | 3.28   |
| WhatsApp     | 12.9           | 1.13   |
| Viber         | 15.3           | 1.2    |
| Instagram     | 63.1           | 2.47   |
| Snapchat     | 31.4           | 2.06   |
| Telegram     | 68.6           | 2.86   |
| Others        | 18.5           | -      |
Table 5. Distribution of total HAD score among students

| Total HADs depression score | % of students |
|----------------------------|--------------|
| Abnormal                   | 45.9         |
| Borderline                 | 24.8         |
| Normal                     | 29.3         |

| Total HADs anxiety score   | % of students |
|----------------------------|--------------|
| Abnormal                   | 52.1         |
| Borderline                 | 20.1         |
| Normal                     | 27.7         |

variables included demographic characteristics, while the total score of HADS was the outcome variable. A p-value of less than 0.05 was statistically significant.

RESULTS

The researchers received 865 surveys, but only 750 were usable (with ≥70% of completed answers). Of the five participating colleges, the University of Baghdad College of Pharmacy (51.7%) had the highest percentage of participants followed by the University of Nahra College of Medicine (16.7%) and University of Nahra College of Pharmacy (15%). Approximately three-quarters (74.1%) of the participants were female students and 95% were between 19 and 23 years of age. The vast majority of the participants were single (92.1%), while only 7.9% were married or engaged (Table 1). Only 8.1% of the participating students had a paid job. More than ninety-one percent (91.2%) of the participants did not report any chronic diseases and 89% had not lost a parent (Table 1). Thirty-nine percent reported good or very good levels in their academic performance (Table 1).

More than half of the participating students (51.8%) had no clear plan for professional goals (Table 2). More than three-quarters of the participants reported going to bed after midnight and 69.4% reported sleeping less than 7 hours each night. Forty percent of the students reported going to bed after 1:00 AM with an average of 5.5 hours of sleep per night (Figure 1). Less than one-half (49%) always had family support during the exams (Table 2). The average student study time per week was 13.46 hours. However, they spent more time browsing social media (6.64 hours/day) than studying (1.92 hours/day), exercising (2.83 hours/week) and social activities (Table 3). The most browsed social media included Facebook (3.3; SD 3.7 hours/day), Telegram (2.9; SD 3.3 hours/day) and Instagram (2.5; SD 3.0 hours/day) (Table 4). Similarly, the most used social media by the students were Facebook (81.7%), Telegram (68.6%) and Instagram (63.1%) (Table 4).

Both scales had good internal consistency (reliability) since the Cronbach’s alpha of the depression and anxiety scales were 0.75 and 0.83, respectively. Depressive symptoms were quite prevalent among healthcare students (45.9%) and one-quarter (24.8%) reported borderline symptoms of depression (Table 5). More than one-third of the participants (36.4%) reported very seldom enjoying a good book, movie or TV program (Figure 2). The depression symptom with highest score (average of 1.88 out of 3) was “I feel as if I am slowed down”.

On the other hand, more than one-half (52.1%) of the participants had scores consistent with anxiety symptoms, while 20.1% reported borderline anxiety symptoms (Table 5). More than 31% of the students reported they “feel tense” most of the time (score 3) (Figure 3).

According to the linear multiple regression analysis, five factors were significantly (p<0.05) associated with depression symptoms including sleep hours at night, weekly study hours, academic achievement, and colleagues and family social support during exams (Table 6). There was a negative association between the number of sleep hours during the night and depression symptoms. In other words, students who reported getting more sleep at night experienced fewer symptoms of depression. More study hours were positively associated with the severity of depression symptoms (higher study hours are associated with more depression symptoms). However, students with higher academic achievement experienced a lower level of depression symptoms. Family and colleagues’ support during exam significantly reduced the level of depression symptoms (Table 6).

According to the linear multiple regression analysis, five factors were significantly (p<0.05) associated with anxiety symptoms including sleep hours at night, study hours weekly, academic achievement, having chronic disease/disability and colleagues and family social support during exams (Table 7). There was a negative association between the number of sleep hours at night and anxiety symptoms. In other words, students who got more sleep experienced lower symptoms of anxiety. More study hours were positively associated with the severity of anxiety symptoms (higher study hours are associated with more anxiety symptoms). However, students with higher academic achievement experienced a lower level of anxiety symptoms. Family and colleagues’ support during exam significantly reduced the level of anxiety symptoms (Table 7).

| Table 6. Multiple linear regression of factors influencing depression levels among healthcare students |
|---------------------------------------------------------------|--|--|--|
| Independent variable | STD Beta | 95% CI | p-value |
|----------------------|----------|--------|---------|
| Sleep hours during night | -0.152 | -0.644 : -0.225 | 0.0001 |
| Weekly study hours | 0.080 | 0.002 : 0.052 | 0.035 |
| Academic achievement | -0.167 | -1.136 : -0.436 | 0.0001 |
| Colleagues support during exams | -0.209 | -1.806 : -0.844 | 0.0001 |
| Family support during exams | -0.148 | -1.346 : -0.430 | 0.0001 |
| Lost parent | -0.027 | -1.361 : 0.635 | 0.475 |
| Chronic disease/disability | -0.008 | -1.192 : 0.950 | 0.825 |
| Smoke hookah | -0.028 | -1.479 : 0.653 | 0.447 |

R-square=0.147 (depression model); Outcome variable=total depression HADS score
95%CI=95% Confidence Interval for B: STD= Standardized
DISCUSSION

In this study, evaluation of depression and anxiety among medical and pharmacy students is crucial as it may consequently influence healthcare services after their graduation. When healthcare providers suffer from psychological/mental disorder like depression or anxiety, this will influence their learning and eventually may have a negatively impact on patients and healthcare system. In the present study, the HADS scale was used to measure the depression and anxiety prevalence and their associated factors among students of pharmacy and medicine. Although the HADS report is not intended for diagnostic purposes, its epidemiological value has been evaluated in several studies which concluded that it is a reliable indicator of depression and anxiety. It is important to indicate that actual diagnosis of mental illness requires a full assessment by a physician.

The study findings showed that most of the participants (about 74%) were female students. Since 2003, the majority of healthcare college students in Iraq are women because they usually score higher in Baccalaureate exam of high school. Having no clear plan for their professional goals may be due the students mainly rely on the governmental employment policy which usually hire all healthcare graduates in the public sector (governmental sponsored) after graduation. Additionally, they will be registered health professionals in the private sector after completing their temporally residency program in the public sector.

Analysis of the data revealed a high prevalence of depression and anxiety among pharmacy and medical students. More than half (52.1%) of the students reported anxiety symptoms and 45.9% of the students had depression symptoms. This high rate of depression and anxiety might be contributed to the war environment, violence and economic crisis that Iraqi people experience during the past three decades. A similar higher rate of depression (57.2%) was also reported by a previous study in the general Iraqi population. A study of social isolation in the U.S. found 19.4% of healthcare college students experience social isolation due to overwhelming study.
Table 7. Multiple linear regression of factors influencing anxiety levels among healthcare students

| Independent variables            | Beta     | 95%CI        | p-value |
|----------------------------------|----------|--------------|---------|
| Sleep hours during night         | -0.135   | -0.677 : -0.194 | 0.0001  |
| Weekly study hours               | 0.081    | 0.002 : 0.060  | 0.037   |
| Academic achievement             | -0.171   | -1.311 : -0.504 | 0.0001  |
| Colleagues support during exams   | -0.158   | -1.683 : -0.575 | 0.0001  |
| Family support during exams      | -0.115   | -1.305 : -0.249 | 0.004   |
| Lost parent                      | -0.005   | -1.224 : 1.075  | 0.999   |
| Chronic disease/disability       | -0.075   | -2.477 : 0.009   | 0.048   |
| Smoke hookah                     | 0.007    | -1.110 : 1.347  | 0.850   |

R-Square=0.109 (anxiety model); Outcome variable=anxiety HADS score. 95%CI=95% Confidence Interval for B; STD= Standardized

However, according to the WHO report in 2015, the prevalence of depression and anxiety in Iraq was 3.7% and 4.5%, respectively.1

For students with depression, we found a significant negative association between their depressive status and sleeping hours (Table 3). The students who had less sleep hours were more likely to experience depression symptoms. We reported that the average night sleeping time of all participants was 5.5 (SD 1.5) hours, and the majority (69.4%) reported sleeping less than 7 hours per night (Table 2). In addition, we also found that about 40% of participants got to sleep after 1:00 AM. This may consequently lead to reduced sleep hours as students have to wake up early morning to go to college. Having insufficient sleep hours may be due to heavy course work which lasts for 5 years (10 semesters).24 Similarly, a previous study has revealed a relationship between inadequate sleep hours and depression occurrence.22 According to a systematic review and meta-analysis including a total of 5,172,710 participants from 153 studies, short sleep was significantly associated with increased mortality.23 A study in Singapore found that depression and anxiety are correlated with sleep disturbances.26 Similarly, a meta-analysis including seven prospective studies and 25,271 patients found a significant positive association between short sleep duration and depression.27

Although we could not find a direct relationship between the use of social media and depression/anxiety severity in this sample of students; however, long time of social media usage (mean 6.6 hours/day) may potentially contribute to late sleeping. According to a large-scale cross-sectional study including 23,533 adults, there is a significant positive association between addictive social media using and mental disorders including depression.28

This study showed that longer studying hours were positively associated with the occurrence of depression and anxiety (Tables 3 & 4). This could be explained by a state of social isolation possibly resulting from the longer studying hours. Similarly, business with heavy coursework was associated with social isolation according to an American study of healthcare students.10 Furthermore, longer studying hours may indirectly influence sleeping time, which contributed to depression and anxiety.

In this study the family and colleagues support had significant protective effects against depression and anxiety (Tables 3 & 4). Students who got support from their families or colleagues reported lower scores of depression and anxiety. Likewise, a study conducted in the context of social support and depression and has concluded lower depression symptoms in the presence of social support.29,30 An American study found the involvement in organization and community activities can help to reduce social isolation among healthcare students.31 This study found that academic achievement of students was negatively related to their depression and anxiety scores. The competition to get high GPA is high among healthcare students since it can decide their acceptance in clinical residency specialties for medical graduates and in Clinical Pharmacy Program for pharmacy graduates.31 Likewise, our team found that peer competition has link to social isolation among American healthcare students.10 Consistent with our report, a previous study suggested that depression and anxiety states would lead to poor academic achievements, and this may negatively influence their prospective career and success.32

The current study also revealed that students mostly used Facebook as social media application with an average of (3.28 hours browsing daily). Similarly, a previous Iraqi study (2015) found that pharmacy students have used Facebook for academic purposes and to communicate with their instructors.33 They had closed Facebook groups to communicate for academic purposes. After March 17, 2020, the university education in Iraq was converted totally to electronic due to COVID-19 pandemic.34 Thus, this high degree of using social media for academic purposes may be reduced during the COVID-19 pandemic era due to using formal electronic course management platforms such as google classroom.34,35 In addition, about 70% of students did not watch TV daily, and this could be explained by the development of internet network ability to attract younger generations. Increasing time of browsing social media applications were on the expense of sport, social and religious activities.10 A Scottish study found that adolescents who used social media frequently experienced lower sleep quality, lower self-confidence and higher levels of anxiety and depression.36

Limitations

The study had some limitations. The study covered several pharmacy colleges, but only one medical school. Thus, the study sample may not represent medical college students. Additionally, the survey sample was convenience and conducted in one province (Baghdad, capital). The study was conducted before COVID-19 pandemic when the education was in-class. Thus, the prevalence of the anxiety and depression may have been increased after switching classes to electronic due to the pandemic since March 2020.
CONCLUSIONS

The students at healthcare colleges are vulnerable to mental illness and anxiety because of study workload and sleep deprivation. To reduce their levels of anxiety and depression, they need more social support, more time for exercise, longer sleep hours, less social media use and a lower academic workload. The study findings give us a warning about the emotional/mental health of healthcare students. Hence, as educators, we need to enhance students’ social support/activities and work to elevate their stressful environment. The universities might need to enhance their mental health counseling services for their students and work to engage them into regular social and sport activities.

CONFLICT OF INTEREST

There are no conflicts of interest to disclose.

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