Prevalence of Generalized Anxiety Disorder among Medical Students in Duhok University, Iraq

Salim Saadi Miho Alhakem,[1] Jarjees A. Sulaiman,[2, *] Muhammad Waleed,[2] Halmat Subhi,[2] and Moatasem Arif[2]

[1]*Department of Internal Medicine/Psychiatry, College of Medicine, University of Duhok, Duhok, Iraq.*
[2]*Medical Student at College of Medicine, University of Duhok, Duhok, Iraq.*

ABSTRACT

Background: Medical students worldwide are experiencing a higher occurrence of anxiety, but there is no available data specifically from the Kurdistan region, Iraq.
Objectives: To estimate the prevalence of generalized anxiety disorder (GAD) and to assess the major stresses and risk factors that lead to the onset of GAD.
Materials and methods: A cross-sectional study was done at the College of Medicine, University of Duhok, Duhok, Iraq. Four hundred and twenty-two medical students participated, and they were assessed for GAD by using the GAD-7 score. The GAD-7 has seven items, each item reflecting the diagnostic criteria of the DSM-5.
Results: A total of 422 students participated in the study. The study revealed that 70.7% of participants had GAD with 38.2%, 19.2%, and 13.3% having mild, moderate, and severe anxiety, respectively. The results revealed that females (female = 84, male = 53), those living in family homes (family homes = 97, dormitory = 40), those residing in urban (urban = 341, rural = 81), those with poorer academic performance, and those in grades 1, 2, and 3 were affected by more severe anxiety.
Conclusion: The prevalence of GAD was high among medical students in Duhok Medical College, and has a significant correlation with gender, residence, academic performance, and student grade. It is recommended to give psychological support and exercise special caution for diagnosing and managing students that may help overcome this psychological condition.
Keywords: Generalized anxiety disorder; Anxiety; Prevalence; Medical students; University of Duhok.

INTRODUCTION

Generalized anxiety disorder (GAD) is an anxiety disorder characterized by excessive, uncontrollable, and often worry or anxious anticipation of events or activities. People with GAD usually anticipate catastrophe and worry excessively about everyday matters such as health problems, money, death, family problems, friendship problems, interpersonal conflicts, and work-related difficulties. Therefore, this excessive worry becomes a daily occurrence Often interfering with daily life [1, 2].

Medical schools worldwide strive to educate and produce empathetic and proficient physicians who will care for the sick, advance the medical field, and improve public health [3]. However, the demanding and stressful nature of medical education increases the likelihood of medical students developing mental health disorders, such as GAD. Medical students face significant challenges and stressors, including rigorous academic schedules, numerous examinations, and long hours of studying, clinical rotations, and patient care responsibilities. Competition between medical schools worries for the future and having to perform extraordinarily well in academics makes it even worse. As a result, medical students exhibit higher levels of anxiety, depression, and burnout as supported by the evidence in the literature.

A high prevalence of GAD among medical students including studies from the US [4], Canada [3], Brazil [5], and China [6] has been reported in several systematic reviews. Medical

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* Corresponding author:E-mail: jarjesabduljabar@gmail.com

Table 1. The generalized anxiety disorder 7-item (GAD-7) scale.

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all	Several days	> Half the days	Nearly every day
Feeling nervous, anxious or on edge	0	1	2	3
Not being able to stop or control worrying	0	1	2	3
Worrying too much about different things	0	1	2	3
Trouble relaxing	0	1	2	3
Being so restless that it is hard to sit still	0	1	2	3
Becoming easily annoyed or irritable	0	1	2	3
Feeling afraid as if something awful might happen	0	1	2	3

students from the Middle East and Asian nations are suspectable to anxiety [7]. These conditions affect females more frequently than males [8].

Those from Middle Eastern nations are more likely to experience anxiety than those from other countries and because Iraq is an important part of those countries, it is essential to address the gaps in understanding the exact risk factors and work toward fix them. Therefore, this study aims to assess the prevalence of GAD among medical students at the University of Duhok and to identify the major stressors and risk factors contribute to the onset of GAD. By achieving these objectives, we hope to provide critical data that will serve as the foundation for the developing strategies and policies aimed at supporting of medical students' mental health.

MATERIALS AND METHODS

This analytic cross-sectional study was conducted at the College of Medicine, University of Duhok, Duhok, Kurdistan, Iraq. It was approved by the Ethical Committee of Duhok Medical College (Reference number: 27032024-2-6, at 27th March 2024). The study was conducted from April to May 2024. The researchers obtained informed consent from the participants. Participation was voluntary, and students knew the study's goal. Questionnaires were anonymously submitted, and confidentiality was guaranteed.

The researchers collected data from 422 students using both face-to-face and online surveys. The response rate was 46.17% (422 students) throughout 914 medical students. Data were taken from each student after being assured that they had no exam in the previous two weeks (exclusion criteria). Otherwise, all students were eligible for participation.

The GAD-7 scale [9] was used to measure individuals' anxiety and questions on their socioeconomic status, occupational status (doing another job), and college grades. The GAD-7 scale consists of seven questions, as shown in Table 1 [9], and each item reflects a diagnostic feature of GAD as outlined in the DSM-5 criteria for diagnosis [1]. When administered to the general public, the GAD-7 scale is reliable and accurate [9–11]. The GAD-7 has demonstrated dependable validity and good internal consistency in the university student sample [12].

The GAD-7 questionnaire asks over the past two weeks how many times each 7 symptoms affected students. The responses include "not at all" scoring a 0, "several days" scoring a 1, "more than half the days" scoring a 2, and "nearly every day" scoring a 3. The total scores range from (0–21), with (0–4), (4–9), (10–14), and (15–21) representing minimal (normal), mild, moderate, and severe anxiety, respectively [9].

Data were analyzed using the statistical package for the

social sciences (SPSS) version 27 (IBM, New York, USA). Categorical variables were described using frequency and percentage, while numerical data were described using mean and standard deviation. The relation between anxiety grade and other variables was tested using the Chi-square test, and in case this was inappropriate (due to low cell frequency), Fisher's exact test was used. A P-value of less than 0.05 was considered a statistically significant.

RESULTS

The mean age was 21.62 ± 1.85, 48.8% from the age group 21-23 years, 52.1% were female, and 64.2% were residents at a family home. Other variables of the study sample are listed in Table 2.

The GAD-7 scores of the study sample were 29.4% minimal, 38.2% mild, 19.2% moderate, and 13.3% severe (Table 3).

Table 4 describes the relationship between sociodemographic characteristics and anxiety grades, in which anxiety has a significant correlation with sex (P-value = 0.009), residency (P-value = 0.014), and origin (rural or urban) (P-value = 0.014), but no significant correlation with age (P-value = 0.143), marital status (P-value = 1), or religion (P-value = 1).

Table 5 describes the relationship between occupational-educational characteristics and anxiety grades, in which anxiety has a significant correlation with academic performance (P-value = 0.001) and college grade (P-value = 0.001), but no significant correlation with additional jobs (P-value = 0.798), social media use (P-value = 0.324), or hours of studying (P-value = 0.640).

DISCUSSION

This study illustrated that the prevalence of GAD is high among medical students. The prevalence of anxiety among medical students has also been the subject of several international studies. Comparing results from multiple studies may be challenging or misleading due to variations in participant personalities, research tools, cultural backgrounds, and methodologies.

The current study found that the majority (38.2%) of participants had mild anxiety. This result was comparable in sitting mild anxiety, while lower in sitting moderate and severe anxiety with the study of AL-Shamlan et al. (2020) [13], who performed research on medical students of Imam Abdulrahman Bin Faisal University (IAU) in Saudi Arabia and found that 26.8% had mild anxiety, 17.4% had moderate anxiety, and 14.3% had severe anxiety according to the GAD-7 questionnaire. El-Gillani et al. (2008) [14] conducted

Table 2. Sociodemographic, occupational, and educational characteristics of the study sample.

Characteristic	Number	Percentage
Age groups (years)		
18 – 20	153	36.3
21 – 23	206	48.8
24 – 30	63	14.9
Sex		
Male	202	47.9
Female	220	52.1
Marital status		
Single	418	99.1
Married	4	0.9
Original residence		
Urban	341	80.8
Rural	81	19.2
Current residence		
Family home	271	64.2
Dormitory	151	35.8
Religion		
Muslim	378	89.6
Christian	20	4.7
Yazidi	21	5.0
Other	3	0.7
Additional job		
Yes	36	8.5
No	386	91.5
Hours per week using social media		
< 1 hour	19	4.5
1–5 hours	119	28.2
6–10 hours	96	22.7
11–15 hours	65	15.4
> 15 hours	123	29.1
Hours per week studying		
< 5 hours	88	20.9
5–10 hours	102	24.2
11–15 hours	81	19.2
16–20 hours	61	14.5
> 20 hours	90	21.3
Rate your overall academic performance		
Poor	26	6.2
Below average	62	14.7
Average	182	43.1
Good	129	30.6
Excellent	23	5.5
Total	422	100

Table 3. Distribution of anxiety grade severity among medical students using GAD-7.

Anxiety grade	Number	Percent
Minimal (0–4)	124	29.4
Mild (5–9)	161	38.2
Moderate (10–14)	81	19.2
Severe (15–21)	56	13.3
Total	422	100.0

Table 4. Relation between sociodemographic characteristics and anxiety grade.

	Anxiety grade				
	Minimal to mild (0–9)		Moderate to severe (10–21)		
Characteristic	Number	Percent	Number	Percent	P-value
Age groups (years)					
18 – 20	98	64.1	55	35.9	
21 – 23	138	67.0	68	33.0	0.143
24 – 30	49	77.8	14	22.2	
Sex					
Male	149	73.8	53	26.2	0.009
Female	136	61.8	84	38.2	
Marital status					
Single	282	67.5	136	32.5	1.000
Married	3	75.0	1	25.0	
Urban or rural origin					
Urban	221	64.8	120	35.2	0.014
Rural	64	79.0	17	21.0	
Current residence					
Family home	174	64.2	97	35.8	0.050
Dormitory	111	73.5	40	26.5	
Religion					
Muslim	255	67.5	123	32.5	
Christian	14	70.0	6	30.0	1.000
Yazidi	14	66.7	7	33.3	
Other	2	66.7	1	33.3	
Total	285	67.5	137	32.5	

a study on medical students at Mansoura University, Egypt, and the College of Medicine in Al-Hassa, King Faisal University, Saudi Arabia using the hospital anxiety and depression (HAD) scale, the prevalence of anxiety was 38.8%. Talih et al. (2018) [15] found that 22.7% of medical students experience anxiety symptoms in Lebanon. Mousa et al. (2016) [16] conducted surveys of residents and medical students, and found that anxiety was present in 20.3% of students in New York. Azad et al. (2017) [17] surveyed at Foundation University Medical College, Rawalpindi they used the Beck Anxiety scale and found that 19% of its medical students experienced moderate to severe anxiety symptoms. Yusoff et al. (2013) [18] revealed that anxiety symptoms were present in 54.5% of Malaysian medical students who were using the depression anxiety stress scale 21 items (DASS-21). Ibrahim et al. (2024) [19], conducted a study at the University of Khartoum, Faculty of Medicine, found that 29.1% of participants suggested having GAD. Despite the difference in the tools used for the assessment of GAD among medical students in the above-mentioned investigations, the results were similar. Therefore, GAD-7 is recommended to be used in clinical practice because it is easier than other tools. The present study found that GAD was significantly associated with gender (P-value = 0.009). Through which females experience more severe anxiety than males. Similar results, showing greater rates of psychological distress among female students, were found in a systematic review of medical students in the USA and Canada

Table 5. Relationship between occupational and educational characteristics with anxiety grade assessed by using GAD-7.

Characteristic	Anxiety grade				P-value
	Minimal to mild (0–9)		Moderate to severe (10–21)		
	Number	Percent	Number	Percent	
Additional job					
Yes	25	69.4	11	30.6	0.798
No	260	67.4	126	32.6	
Hours per week using social media					
< 1 hour	16	84.2	3	15.8	
1–5 hours	84	70.6	35	29.4	
6–10 hours	66	68.8	30	31.3	0.324
11–15 hours	40	61.5	25	38.5	
> 15 hours	79	64.2	44	35.8	
Hours studying per week					
< 5 hours	56	63.6	32	36.4	
5–10 hours	65	63.7	37	36.3	
11–15 hours	56	69.1	25	30.9	0.640
16–20 hours	43	70.5	18	29.5	
> 20 hours	65	72.2	25	27.8	
Rate your overall academic performance					
Poor	9	34.6	17	65.4	
Below average	34	54.8	28	45.2	
Average	128	70.3	54	29.7	0.001
Good	94	72.9	35	27.1	
Excellent	20	87.0	3	13.0	
College grade					
Stages 1–3	140	60.9	90	39.1	0.001
Stages 4–6	145	75.5	47	24.5	
Willing to seek help if overwhelmed by anxiety					
Yes	174	70.4	73	29.6	0.129
No	111	63.4	64	36.6	
Total	285	67.5	137	32.5	

[3]. AL-Shamlan et al. (2020) [13], and Azad et al. (2017) [17] found in their studies that females experience anxiety more than males. This clarifies the importance of family, college staff, and colleagues' support to minimize the symptoms of anxiety particularly for female students.

This investigation revealed that the prevalence of GAD was significantly associated with residency from urban or rural origin (P-value = 0.014) and family home or dormitory (P-value = 0.05). The urban participants compared to the rural participants have more anxiety. Mbanuzuru et al. (2023) [20] conducted research among secondary school adolescents in Anambra State and illustrated that urban populations are more prone to anxiety. Bonnell et al. (2022) [21] found that adults from rural residents had better mental health than their urban counterparts. Students from the dormitory experience less anxiety than those from the family home. Liaqat

et al. (2017) [22] found that medical students from the family home experience more anxiety than students from the dormitory. This may be due to family pressure at home. This clarifies the importance of family support, to make a sustainable and comfortable environment at home.

The current investigation found that academic performance was significantly associated with the prevalence of GAD. In which those who have better academic performance have less severe anxiety. This may indicate that anxiety is contributing to academic performance. A meta-analysis of 5 studies shows that anxiety has a negative effect on academic performance [23]. The better academic performance reduces the fear of failing and less academic pressure. This study found that college grade was significantly associated with the prevalence of GAD. Students in grades 1–3 experience more severe anxiety than students in grades 4–6 (P-value = 0.001). Jadoon et al. (2010) [24] conducted research at Nishtar Medical College, Multan, in 2008, and found that in the first, second, third, fourth, and final year of study, the prevalence of anxiety and depression was 45.86%, 52.58%, 47.14%, 28.75%, and 45.10%, respectively. Bassols et al. (2014) [25] in their study found that 30.8% of first-year students and 9.4% of sixth-year students reported having anxiety symptoms. This may be due to academic transition, uncertainty, and fear of failure among students in grades 1, 2, and 3.

The result of the present study aligns with Ghaffar et al. (2023) [26] which reported that age is not associated with GAD. This may be due to that there is no wide range of age among the participants as well as the GAD could affect any age of the participants.

There are several inherent limitations that are associated with cross-sectional studies, even though they are useful for determining the prevalence and identifying associations. It is difficult to determine the direction of the relationship because both the exposure and the outcome are measured simultaneously, which makes it difficult to establish causality. This is one of the most significant drawbacks of this study. Furthermore, this study is susceptible to several biases, such as selection bias, which occurs when certain populations may be over- or under-represented, and recall bias, which is especially prevalent in data that is self-reported through the participants.

CONCLUSION

The prevalence of GAD was high, with 70.6% of participants affected. Given the higher susceptibility of medical students to anxiety and the elevated prevalence of anxiety among them, it is crucial to exercise special caution for diagnosing and managing students with anxiety. We are addressing the underlying factors responsible for the elevated prevalence of anxiety among medical students including gender, a residency from urban or rural origin, academic performance, and student grade, which have a significant correlation with anxiety, while other sociodemographic characteristics have no significant correlation with anxiety. Our results indicate a strong need for a larger-scale study with a prospective design.

ETHICAL DECLARATIONS
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Ethics Approval and Consent to Participate

The study was approved by the Ethical Committee of Duhok Medical College (Reference number: 27032024-2-6, on 27$^{\text{th}}$ March 2024). Informed consent was obtained from each participant.

Consent for Publication

Not applicable (no individual personal data included).

Availability of Data and Material

Data generated during this study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that there is no conflict of interest.

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Authors' Contributions

All authors have equal participation in the design, collection of the data, analysis of the results, and writing of the manuscript. All authors read and approved the final version of the manuscript.

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