Title: Prevalence of Generalized Anxiety Disorder and Associated Risk Factors Among Medical Students in Sudan: A Cross-Sectional Study at Omdurman Islamic University

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Discussion Points:

1. How does the socio-political and economic context in Sudan impact the prevalence of Generalized Anxiety Disorder among medical students? #MentalHealth #MedicalStudents
2. Did you know that over 33% of Sudanese medical students in our study experienced Generalized Anxiety Disorder? What factors contribute to this high prevalence? #GAD #HealthResearch
3. 📊 374 medical students participated in our study, revealing 41.2% with mild anxiety, 21.4% moderate, and 12.3% severe anxiety. How can we better support their mental well-being? #MentalHealthAwareness #MedicalEducation
4. Female students and those in the final year showed higher GAD-7 scores. What interventions can be implemented to address specific stressors for these groups? #StudentWellness #Healthcare
5. Our research highlights the impact of GAD on daily activities among Sudanese medical students. How can educational institutions promote a supportive environment for mental health? #StudentLife #WellBeing
6. What steps can be taken to raise awareness, destigmatize mental health discussions, and ensure accessible counseling services for Sudanese medical students? Share your thoughts! #MentalHealthMatters #CommunitySupport

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ABSTRACT.

Background: Generalized Anxiety Disorder (GAD) is a mental illness that significantly affects various domains of daily functioning. Limited research has been conducted on GAD among medical students in Sudan, particularly during the socio-political and economic crises. This study aimed to assess the prevalence of GAD, identify risk factors, and evaluate its impact on academic performance and daily activities among Sudanese medical students.

Methods: A cross-sectional study was conducted among undergraduate medical students at Omdurman Islamic University. Data were collected using a self-administered online questionnaire via Google Forms, consisting of two parts: socio-demographic information and the Generalized Anxiety Disorder Questionnaire (GAD-7), a validated tool for screening and measuring the severity of GAD.

Results: A total of 374 medical students participated, with 64.7% being female. The GAD-7 scores were high (above 9), suggesting GAD among 33.7% of participants, with severity levels of 41.2% for mild anxiety, 21.4% for moderate anxiety, and 12.3% for severe anxiety. Comparison of means showed significant associations between GAD and female students ($p < 0.001$) and students with chronic diseases ($p = 0.034$). GAD significantly impacted daily activities ($p < 0.001$). Multiple logistic regression analysis found that students in the final year had significantly higher GAD-7 scores (AOR = 4.246).

Conclusions: The higher scores on the GAD-7 measure among Sudanese medical students are concerning. This emphasizes the urgent need to raise awareness, normalize mental health discussions, and provide accessible counseling services tailored to the students' needs.

Key Words: generalized anxiety disorder, medical students, prevalence, risk factor

INTRODUCTION.

Mental disorders are the leading cause of disability worldwide. Individuals with significant mental health issues tend to have a lifespan that is 10 to 20 years shorter than that of the average person.[1]

Generalized Anxiety Disorder (GAD) is a mental condition characterized by persistent and excessive anxiety and worry about various events or activities, such as school or work performance. These symptoms occur on most days for at least six months and can hinder functioning in social, occupational, or other domains.[2]

The disease is highly prevalent; in the United States, it is estimated that 6.8 million adults have GAD, with only 43.2% receiving treatment.[3] It is also estimated that 5.7% of U.S. adults experience generalized anxiety disorder at some point in their lives.[4]

Studies have consistently shown that females are more likely than males to develop GAD,[5,6] with the prevalence being twice as high for them.[7]

There are other risk factors associated with GAD, such as genetic factors [8] and chronic diseases like diabetes mellitus,[9] asthma,[10] and systemic lupus erythematosus.[11]

The demanding nature of medical school with challenging training programs, both academically and emotionally across all professions, places medical students at a higher risk for GAD compared to the general population. Studies have revealed that 29% to 38% of medical students experience GAD, in contrast to the 3% to 25% prevalence observed in the general population.[12] The academic years in medical school are filled with numerous challenges, including demanding coursework, difficult exams, and extensive study hours.

Studies have shown that the prevalence of GAD among medical students varies between countries. A study conducted in the USA reported that 65.9% of medical students exhibited symptoms of anxiety.[13] Meanwhile, in Saudi Arabia, 69% of medical students were found to have varying degrees of GAD,[14] and in Egypt, the rate was a bit higher at 77.1%.[15]

The effects of GAD on medical students are profound. A study conducted in Mexico aimed to assess the impact of GAD on university students during the COVID-19 pandemic on academic performance. The findings revealed a significant negative effect of anxiety on students' academic performance.[16] Similarly, a study among medical students in Syria demonstrated a negative association between anxiety and academic performance.[17]

Anxiety not only affects academic performance but also impairs the ability to achieve work goals, manage household tasks, and interact with others. Several studies have reported that GAD is associated with a poor quality of life.[18,19]

While the global prevalence rates are alarming, the situation in Sudan presents unique challenges; in 2020, a study among medical students revealed prevalence rates of depression at 75%, anxiety at 55.3%, and stress at 51.8%.[20] In recent years, Sudan has faced political and environmental instability, significantly impacting the mental health of its population. Medical students in Sudan are particularly struggling to manage the requirements of their academic programs with the unstable socio-political environment, potentially exacerbating their mental health issues.[21]

Given the significant global and local implications of GAD among medical students, particularly amidst the critical socio-political challenges in Sudan, there is a pressing need for more comprehensive studies within the country. This study aimed to determine the prevalence of GAD, explore associated risk factors, and evaluate its impact on academic performance and daily activities among medical students at Omdurman Islamic University to contribute valuable insights that can guide more effective mental health support strategies for medical students in Sudan.

METHODS

Ethical Considerations:

This study received ethical approval on July 21, 2022, from the Ethics Committee of the Faculty of Medicine at Omdurman Islamic University (Ethical Approval No. 3/2022). All participants provided informed consent online.

Study setting and design:

This descriptive cross-sectional institution-based study was conducted among medical students at Omdurman Islamic University from October to December 2022. The university, located in Omdurman City, Khartoum State, Sudan, had approximately 26,000 students in 2022.

Sampling strategy:

The sample size was calculated to be 379 using the following formula ($n=Z^2p[1-p]/d^2$), where n = calculated sample size, p is the prevalence of anxiety based on a previous study = 0.553, Z is the confidence level used = 1.96, and d = the level of precision (0.05).[20]

Participants for the study were selected using a systematic random sampling technique. The student list was obtained from the faculty administration. To determine the sampling interval, we divided the total number of medical students by the calculated sample size, resulting in an interval of five. A random number generator was used to select the first study participant from the first five students on the list. Subsequently, every fifth student from this initial point was selected to participate in the study. The inclusion criteria included medical students actively enrolled at the university. There were no exclusion criteria. At the start of the questionnaire, participants were informed about the purpose of the study, and assured that their involvement was entirely voluntary and that their anonymity would be preserved. Only those who gave their consent were able to fill out the questionnaire.

Data collection tools

Data were collected using a self-administered online questionnaire via Google Forms. The selected participants received the questionnaire link through WhatsApp. The questionnaire consisted of two sections: The first part was socio-demographic information, specific risk factors, and academic performance data: (gender, age, marital status, academic year, residence, living situation, grade point average (GPA), and medical history). The second part assessed GAD severity using the Generalized Anxiety Disorder Questionnaire (GAD-7).

Academic performance:

The academic performance of students was evaluated using their Grade Point Average (GPA), as per the system of the faculty of Medicine at Omdurman Islamic University administration. GPAs were categorized on a scale from 0 to 4, with the following classifications: Distinction (3.5-4), Very Good (3-3.49), Good (2.50-2.99), Pass (2-2.49), and Fail (<2).

Generalized anxiety disorder (GAD-7):

The GAD-7 is a valid and efficient tool for screening GAD and its severities. Scores are interpreted as follows: <5 (normal), 5-9 (mild anxiety), 10-14 (moderate anxiety), and 15-21 (severe anxiety). A cut-off score of 10 identifies cases of GAD, with a sensitivity of 89% and a specificity of 82%.[22,23]

Statistical analysis:

Data were analyzed using SPSS version 28. Descriptive statistics, such as frequencies, means, standard deviations, and percentages, were employed to describe the dataset. A GAD-7 score of 10 or more was considered indicative of high anxiety levels. The relationship between risk factors and GAD was analyzed using t-tests and one-way ANOVA. Statistical significance was set at P = 0.05 or less. To measure the effect size, Cohen's d was used for t-tests, and eta-squared was used for one-way ANOVA tests. Simple and multiple logistic regression, were performed to predict Generalized Anxiety Disorder from various independent variables.

RESULTS.

Sociodemographic and risk factor profiles of study participants

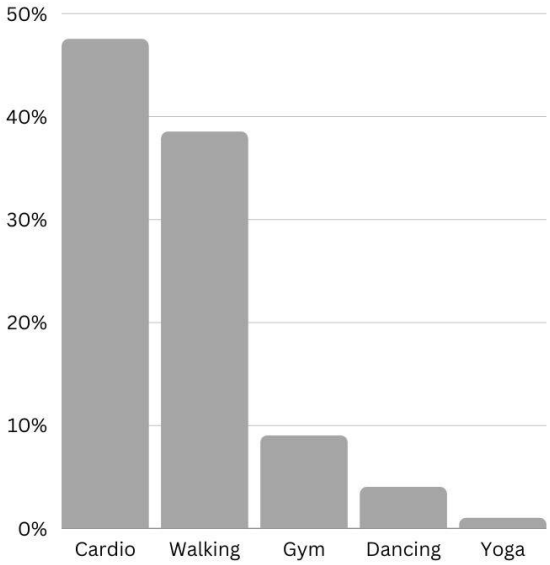
A total of 374 medical students participated in this study. The majority of them were female (64.7%). Their mean age was 21.07 ± 2.18, ranging from 16 to 29 years. Socio-demographic data are presented in Table 1.

Table 1: Sociodemographic and Risk Factor Data of Medical Students at Omdurman Islamic University, n=374

Variable	N	%
Gender		
Male	132	35.3
Female	242	64.7
Academic year		
1st year	80	21.4
2nd year	85	22.7
3rd year	69	18.8
4th year	79	21.1
5th year	61	16.3
Residency city		
Khartoum	82	21.9
Bahri	42	11.2
Omdurman	247	66.0
Madani	3	0.8
Marital status		
Single	366	97.9
Married	8	2.1
Residency situation		
First degree family	219	58.6
2nd degree family	27	7.2
Dormitory	108	28.8
In apartments with other students	17	4.5
With husband	1	0.3
Alone	2	0.6
Chronic Disease Presence		
yes	37	9.9
No	337	90.1
Exercise Frequency Per Week		
No	299	79.9
1-2 times	21	5.6
3-4 times	29	7.8
5 times	17	4.5
More than 5 times	8	2.1
Smoking status		
Ex-smoker	7	1.9
Smoker	8	2.1
Not smoker	359	96.0

Out of the 374 medical students who participated in the study, 101 of them reported engaging in regular exercise. It was found that nearly 50% of these students reported engaging in regular cardio exercises, while approximately 40% stated that they regularly engage in walking exercises, as depicted in Figure 1.

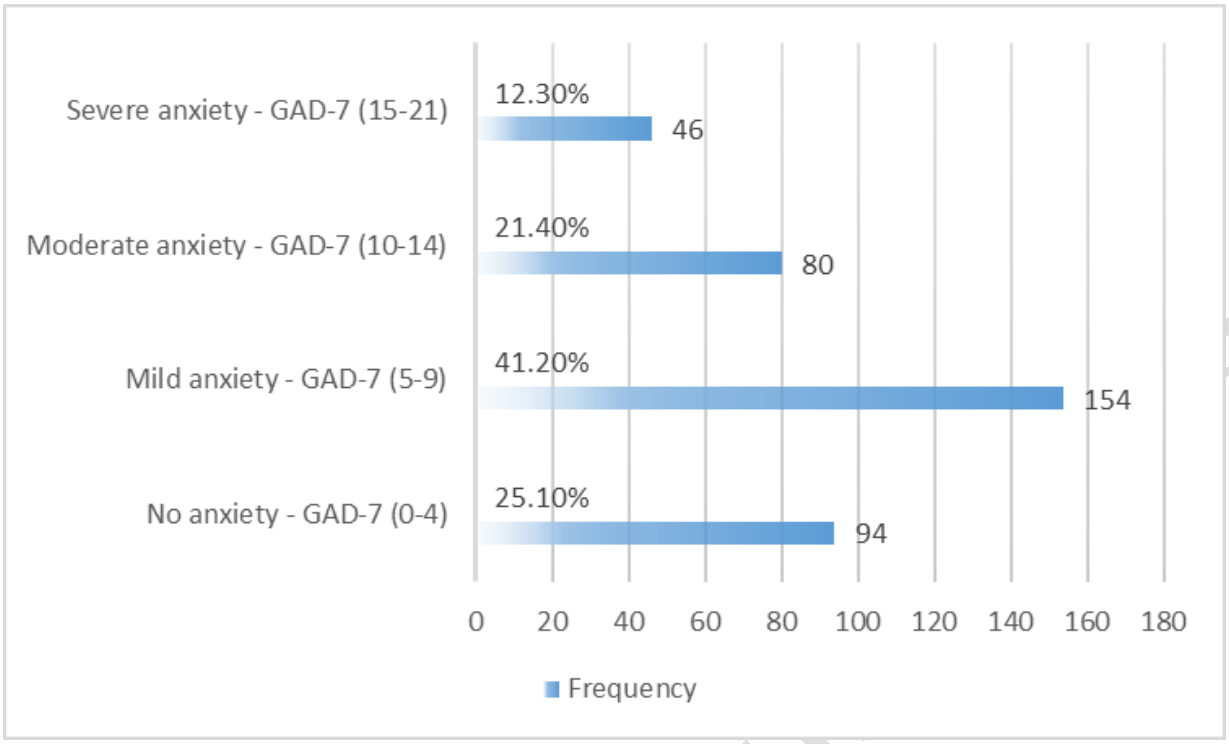
Figure 1: Types of Exercises Performed by Participants, Sudan, 2022, n=101



Prevalence and severity of generalized anxiety disorder among medical students at Omdurman Islamic University

According to the GAD-7 scale, 33.7% of the medical students exhibited high GAD scores, indicating scores of 10 or more. The severity of these anxiety levels is detailed in figure 2.

Figure 2: Prevalence and Severity of GAD Among Participants at Omdurman Islamic University, n=374



Assessment of the risk factors for GAD among medical students at Omdurman Islamic University

A comparison of means was conducted to examine variable differences in GAD-7 scores. The results indicated that Female medical students (M = 7.80) had significantly higher GAD-7 scores than male medical students (M = 6.06) ($p < 0.001$). Additionally, no significant differences were found between age, academic year, residence city, marital status, residence situation, smoking status, and GAD-7 scores (all p-values > 0.05). However, medical students with chronic diseases had significantly higher GAD-7 scores (M = 8.64) than those without (M = 7.03) ($p = 0.034$). Furthermore, there was a significant difference in the GAD-7 scores between medical students who reported performing regular exercise (M = 7.41) and those who did not (M = 6.29) ($p = 0.050$). Table2.

Table 2: Mean Scores, Standard Deviations, and Effect Sizes of GAD-7 Scores Across Socio-Demographic and Risk Factors.

Variable	Mean	Standard deviation	p value	Effect size
Gender			0.000	-0.402
Male	6.0682	4.40366		
Female	7.8099	4.29670		
Age				0.009
Less than 18 years	7.1429	5.14550		
18 to 20 years	6.9623	4.46773	0.362	
21 to 25 years	7.4700	4.35591		
More than 25 years	5.0000	3.74166		
Academic year			0.352	0.012
1st year	6.8625	4.62723		

2nd year	6.6235	4.49597		
3rd year	7.1884	3.80895		
4th year	7.5190	4.69823		
5th year	8.0164	4.21304		
Residency city				0.002
Khartoum	7.4024	4.54024	0.850	
Bahri	7.4048	3.62282		
Omdurman	7.0729	4.51497		
Madani	8.6667	2.30940		
Marital status				-0.564
Single	7.1421	4.35815	0.115	
Married	9.6250	6.18610		
Residency situation				0.025
First degree family	7.1826	4.48989		
2nd degree family	5.2963	4.40118		
Dormitory	7.4909	4.14584	0.055	
In apartments with other students	8.0000	4.31567		
With husband	15.0000	N/A		
Chronic Disease Presence				0.3676
yes	8.6486	5.56884	0.034	
No	7.0356	4.24179		
Exercise				0.2548
Yes	7.4167	4.46574	0.050	
No	6.2973	4.07374		
Smoking status				0.004
Ex-smoker	9.1429	4.67007		
Smoker	7.8750	6.08129	0.449	
Not smoker	7.1421	4.36714		

A multiple logistic regression analysis was conducted to investigate the relationship between several predictor variables and the presence of Generalized anxiety disorder. The results show that being female ($p < 0.001$, AOR = 2.399) and being in the 5th academic year ($p = 0.019$, AOR = 4.246) were associated with higher odds of anxiety. Table 3.

Table 3: Multiple Logistic Regression of Predictors of Generalized Anxiety Disorder

Predictor Variable	Adjusted Odds Ratio (AOR)	95% CI for OR	p-value
Age	0.898	[0.757, 1.064]	0.214
Gender			
Male	1.000 (Reference)	-	-
Female	2.399	[1.458, 3.946]	<0.001
Academic year			
1st year	1.000 (Reference)	-	-
2nd year	1.297	[0.646, 2.604]	0.464
3rd year	2.028	[0.888, 4.633]	0.094
4th year	2.337	[0.908, 6.012]	0.078
5th year	4.246	[1.267, 14.221]	0.019
Marital status			
Not married	1.000 (Reference)	-	-
Married	0.657	[0.122, 3.525]	0.624
Chronic disease			

No	1.000 (Reference)	-	-
Yes	0.780	[0.365, 1.667]	0.522
Exercise			
No	1.000 (Reference)	-	-
Yes	1.203	[0.677, 2.136]	0.529

Impact of GAD on academic performance among medical students at Omdurman Islamic University

The mean grade point average (GPA) of the medical students is 3.25 ± 0.525 SD. To evaluate the impact of Generalized Anxiety Disorder on students' academic performance, we compared the means of the GPA across various GAD severity levels using an ANOVA test. The findings, detailed in Table 4, show no significant differences in the GPAs across the different levels of anxiety among the students.

Table 4: The Mean Scores and Standard Deviations of GPA Across GAD Severities.

GAD severities	GPA Mean	Standard deviation	p value
No Anxiety	3.23	0.623	0.160
Mild Anxiety	3.32	0.469	
Moderate Anxiety	3.16	0.512	
Severe Anxiety	3.26	0.491	

Impact of GAD on daily life activities among medical students at Omdurman Islamic University

A comparison of the means was conducted to study the impact of GAD on daily activities among students. Significantly higher mean GAD-7 scores were found among students who reported extremely difficult (11.80) and very difficult (11.95) daily activities, and lower mean GAD-7 scores were found among students who reported not difficult (4.10) and somewhat difficult (6.86) daily activities ($p < 0.001$). Table 5.

Table 5: The Impact of GAD Severity on Daily Life Activities

Description	Mean	Standard Deviation	p-value	Effect Size
If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?				
Not difficult at all	4.1089	3.67124	<0.001	0.380
Somewhat difficult	6.8653	3.25360		
Very difficult	11.9545	3.94706		
Extremely difficult	11.8056	3.60015		

DISCUSSION.

Our study found that 33.7% of medical students had significantly high GAD-7 scores (scores > 9), suggesting the possibility of GAD. This rate is slightly higher than the 29% recently reported among medical students at the University of Khartoum, Sudan.[24] Another study, conducted during the COVID-19 lockdown in Sudan reported a prevalence rate of 55.3%; however, this study employed the DASS-21 scale, a different assessment tool, potentially explaining the variance in rates.[20]

Participants in our study were exposed to a complex social and political environment characterized by political unrest and economic hardship. Even following the COVID-19 pandemic, colleges often faced closures due to the unstable political situation. These factors could heighten anxiety and uncertainty about future careers among students, thereby impacting their mental well-being.

Comparatively, studies in Saudi Arabia and the USA reported prevalence rates of 31.2% and 30.6%, respectively.[13,25] In contrast, studies in Egypt reported higher anxiety rates of 77.1% and 56%; however, these studies utilized the DASS-42 tool, which might account for the higher rates. [26,27]

A high level of stress often accompanies medical school. A comparative study assessed stress levels among students from various disciplines. The findings revealed that 54.3% of medical students reported experiencing significant stress, compared to 36.6% of arts students, 32% of business students, and 15.3% of engineering students.[28]

In our study, a significant association was observed between female medical students and GAD ($p < 0.001$). This finding is consistent with studies conducted among medical students in several countries, including Saudi Arabia,[29] Turkey,[30] Egypt,[31] and the United States.[13] Some studies suggest that specific biological factors, such as abnormalities in female hormones, might contribute to increased anxiety in women, potentially leading to a higher risk of GAD compared to men.[32,33] Another study indicated that female students may be more susceptible to GAD due to their perception of patient contacts and autopsy-related duties as stressful, with exams also being a significant source of stress.[34] Moreover, multiple studies have reported that female medical students are more likely to experience of imposter syndrome, which is strongly associated with anxiety and other psychological conditions.[35,36]

The study revealed that final-year medical students were more likely to experience generalized anxiety disorder (GAD) than students in earlier academic years (AOR= 4.25) ($p=0.019$). This can be explained by the increase in academic and practical workloads, as well as the stress associated with final exams, during the last year. This aligns with previous research indicating a progressive increase in stress throughout medical education.[37] Existing studies suggest that mental health often declines upon entering medical school and remains challenging throughout the program.[38]

Regarding academic performance, our study did not find a significant difference in GPA scores across different GAD severities. This finding contradicts the results of many studies, including a meta-analysis of 238

studies, which found a significant association between increased GAD severity and poorer academic performance.[39] However, our results align with other research that found no association between academic performance and GAD.[40] Some studies have even suggested that anxiety levels might increase with higher GPA scores, as students may become more concerned about maintaining their grades.[25] These variations could be attributed to the different tools used, which can lead to varied results. It is worth noting that our study relied on self-reported GPA, rather than obtaining the data directly from faculty administration.

In our study, students who reported extreme difficulty in achieving their work, managing household tasks, or interacting with others had significantly higher mean GAD scores. This finding is similar to previous studies that have reported a positive correlation between higher levels of anxiety severity and poorer quality of life,[18,19] and lower health-related quality of life.[41]

Medical students with chronic diseases in our study exhibited higher mean GAD scores, consistent with earlier research that found significantly higher GAD scores among patients with conditions such as asthma,[10] type 2 diabetes,[9] and systemic lupus erythematosus (SLE).[11] These findings suggest that medical students with chronic diseases may be more susceptible to developing symptoms of GAD, which could have important implications for their mental health and overall well-being.

Surprisingly, our study demonstrates that medical students who engaged in regular exercise scored higher on the GAD-7 scale. This is contradictory to the existing literature, which suggests that physical activity plays an essential role in anxiety treatment[42], particularly high-intensity exercise.[43,44] However, this finding could be attributed to several factors. First, students with higher levels of anxiety might be more inclined to use regular exercise as a coping mechanism, leading to a correlation where those with higher anxiety levels are also those who exercise more. Second, medical students may engage in exercise to manage the high stress of their academic environment, which could contribute to higher anxiety levels despite regular physical activity. Additionally, it is noteworthy that the number of students who reported engaging in regular exercise was relatively small (n=101), which could influence the study's findings.

Strengths and limitations

Our study provided significant insights into the mental health challenges faced by medical students in Sudan during a critical period. It was conducted at one of the largest and most prominent public universities in the country. However, the study had certain limitations. While the GAD-7 tool was reliable, it's important to acknowledge that it functioned as a screening tool rather than a diagnostic instrument; a clinical assessment was necessary for a definitive diagnosis. The study was conducted at the Faculty of Medicine at Omdurman Islamic University. Although this is a large institution, this specific setting might have limited the ability to generalize our findings to medical students in other regions or countries. This suggested the need for multicenter studies. Furthermore, the majority of our study participants were female, which might have influenced the applicability of our findings across different genders. Moreover, the small sample size might have reduced the study's statistical power to detect significant effects.

Conclusion.

This study revealed high GAD scores among Sudanese medical students, with significant associations found between GAD and female medical students as well as students with chronic diseases. GAD was found to negatively impact the ability of affected students to manage household tasks. The high prevalence of anxiety among medical students raises concerns, emphasizing the need for increased awareness, mainly focusing on recognizing and managing anxiety disorders. It is crucial to normalize discussions about mental health and provide easy access to counseling and psychotherapy services tailored to student needs. Additionally, fostering a culture of wellness within medical schools should be prioritized, with an emphasis on promoting healthy habits such as exercise, adequate sleep, and stress management. Furthermore, establishing peer support systems, including mentorship programs where senior students can guide and support juniors, can significantly contribute to a supportive environment. Additionally, training should be provided to faculty and administrative staff on how to identify and respond to students who experience anxiety, ensuring they can offer appropriate support or referrals. Future research should focus on evaluating the barriers to conducting and assessing the effectiveness of mental health services targeted at medical students and intervention programs aimed at reducing anxiety.

SUMMARY - ACCELERATING TRANSLATION

Title

Understanding Anxiety among Medical Students in Sudan: A Study from Omdurman Islamic University

Main Problem:

Anxiety, specifically Generalized Anxiety Disorder (GAD), was identified as a significant challenge globally, notably affecting the academic performance and overall quality of life of medical students. This problem was particularly pronounced in regions experiencing socio-political unrest, such as Sudan, where medical students were under increased stress due to the demanding nature of their studies compounded by external instability.

Aim:

The study aimed to assess the prevalence of GAD among medical students at Omdurman Islamic University, identify the key factors that contributed to its development, and evaluate its impact on students' academic achievements and daily functioning. The ultimate goal was to provide insights that could aid in developing better support systems for medical students' mental health, particularly in challenging environments like Sudan.

Methodology:

This study was conducted among medical students at Omdurman Islamic University, a public university in Omdurman City, Sudan. The university was established in 1912 and has 22 faculties. In 2022, there were around 26,000 students. We used a method called systematic sampling to select participants for the study.

To collect data, we used an online questionnaire with two parts. The first part asked about things like age, gender, marital status, academic year, where the students lived, their grade point average, and medical history. The second part focused on generalized anxiety disorder (GAD) and used a questionnaire called the Generalized Anxiety Disorder Questionnaire (GAD-7) to measure its severity.

The study followed ethical guidelines and received approval from the Omdurman Islamic University Ethics Committee of the Faculty of Medicine. All participants gave their consent to participate in the study electronically.

Results:

In this study, we looked at a total of 374 medical students who participated. It's interesting to note that the majority of them were female, making up 64.7% of the participants. Out of all the medical students in the study, 35 of them mentioned having a chronic disease. What's even more interesting is that more than one-third of these students, specifically 35.7%, reported having asthma.

Out of the 364 medical students who took part, 101 of them said they regularly exercise. It's worth mentioning that nearly half of these students, about 50%, mentioned doing cardio exercises on a regular basis. Additionally, around 40% of them said they regularly engage in walking exercises.

We found that about one-third of the medical students, specifically 33.7%, had high possibility of Generalized Anxiety Disorder (GAD). When we looked at the severity of anxiety, we found that 41.2% had mild anxiety, 21.4% had moderate anxiety, and 12.3% had severe anxiety.

To understand the differences in anxiety levels, we compared the average scores. It turned out that female medical students had significantly higher anxiety scores (average score of 7.80) compared to male medical students (average score of 6.06). However, we didn't find any significant differences in anxiety scores based on factors like age, city of residence, marital status, or living situation.

We found that fifth-year medical students are significantly more likely to experience anxiety than students in other academic years

Interestingly, medical students with chronic diseases had significantly higher anxiety scores (average score of 8.64) compared to those without chronic diseases (average score of 7.03). Moreover, we found a significant difference in anxiety scores between students who reported regular exercise (average score of 7.41) and those who didn't (average score of 6.29).

We also looked at the impact of anxiety on academic performance. however, we didn't find any significant association between anxiety and academic performance.

To understand how anxiety affects daily activities, we compared the average scores again. Students who reported extremely difficult daily activities had significantly higher anxiety scores (average score of 11.80), as did those who reported very difficult daily activities (average score of 11.95). On the other hand, students who found their daily activities not difficult (average score of 4.10) or somewhat difficult (average score of 6.86) had lower anxiety scores.

Conclusion:

This study showed a high level of GAD among Sudanese medical students. Key insights include that high GAD is associated with female students and those suffering from chronic diseases and the negative effect of GAD on managing daily tasks. The concerning levels of anxiety among medical students underscore the urgent need for heightened awareness and better management strategies for anxiety disorders. The study advocates for normalizing mental health discussions, ensuring accessible mental health services tailored to students, and promoting a wellness culture within medical educational institutions. Emphasizing healthy lifestyle choices, establishing supportive peer networks, and providing training for faculty and staff on recognizing and addressing student anxiety are pivotal steps. The conclusion calls for further research into the obstacles faced in implementing effective mental health services and interventions specifically designed to alleviate anxiety among medical students, aiming to enhance their overall well-being and academic success.

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FIGURES AND TABLES.

Figure 3: Types of Exercises Performed by Participants, Sudan, 2022, n=101

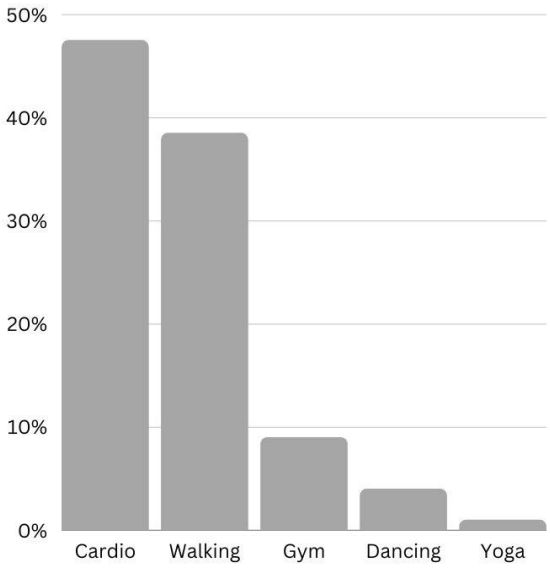

Figure 4: Prevalence and Severity of GAD Among Participants at Omdurman Islamic University, n=374

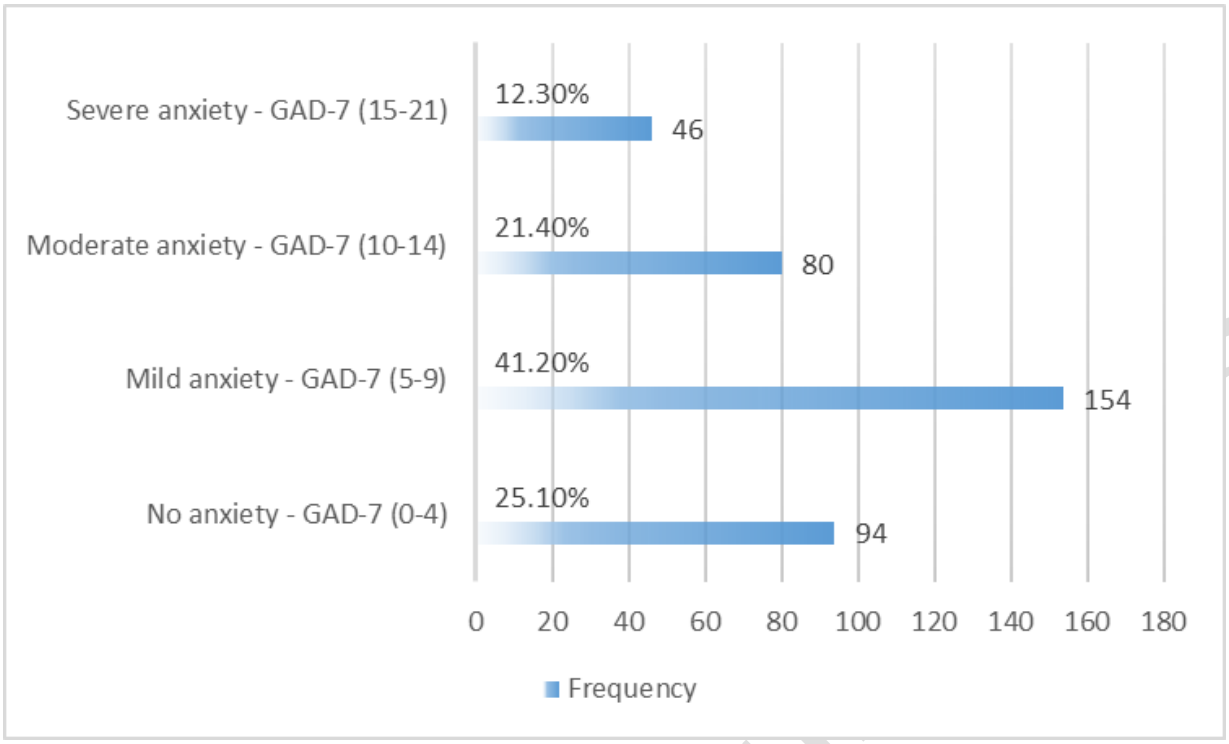

Table 2: Sociodemographic and Risk Factor Data of Medical Students at Omdurman Islamic University, n=374

Variable	N	%
Gender		
Male	132	35.3
Female	242	64.7
Academic year		
1st year	80	21.4
2nd year	85	22.7
3rd year	69	18.8
4th year	79	21.1
5th year	61	16.3
Residency city		
Khartoum	82	21.9
Bahri	42	11.2
Omdurman	247	66.0
Madani	3	0.8
Marital status		
Single	366	97.9
Married	8	2.1
Residency situation		
First degree family	219	58.6
2nd degree family	27	7.2
Dormitory	108	28.8
In apartments with other students	17	4.5
With husband	1	0.3
Alone	2	0.6
Chronic Disease Presence		
yes	37	9.9
No	337	90.1
Exercise Frequency Per Week		
No	299	79.9
1-2 times	21	5.6
3-4 times	29	7.8
5 times	17	4.5
More than 5 times	8	2.1
Smoking status		
Ex-smoker	7	1.9
Smoker	8	2.1
Not smoker	359	96.0

Table 2: Mean Scores, Standard Deviations, and Effect Sizes of GAD-7 Scores Across Socio-Demographic and Risk Factors.

Variable	Mean	Standard deviation	p value	Effect size
Gender			0.000	-0.402
Male	6.0682	4.40366		
Female	7.8099	4.29670		
Age				0.009
Less than 18 years	7.1429	5.14550		
18 to 20 years	6.9623	4.46773	0.362	
21 to 25 years	7.4700	4.35591		
More than 25 years	5.0000	3.74166		
Academic year				0.012
1st year	6.8625	4.62723		
2nd year	6.6235	4.49597		
3rd year	7.1884	3.80895	0.352	
4th year	7.5190	4.69823		
5th year	8.0164	4.21304		
Residency city				0.002
Khartoum	7.4024	4.54024		
Bahri	7.4048	3.62282	0.850	
Omdurman	7.0729	4.51497		
Madani	8.6667	2.30940		
Marital status				-0.564
Single	7.1421	4.35815	0.115	
Married	9.6250	6.18610		
Residency situation				0.025
First degree family	7.1826	4.48989		
2nd degree family	5.2963	4.40118		
Dormitory	7.4909	4.14584	0.055	
In apartments with other students	8.0000	4.31567		
With husband	15.0000	N/A		
Chronic Disease Presence				0.3676
yes	8.6486	5.56884	0.034	
No	7.0356	4.24179		
Exercise				0.2548
Yes	7.4167	4.46574	0.050	
No	6.2973	4.07374		
Smoking status				0.004
Ex-smoker	9.1429	4.67007		
Smoker	7.8750	6.08129	0.449	
Not smoker	7.1421	4.36714		

Table 3: Multiple Logistic Regression of Predictors of Generalized Anxiety Disorder

Predictor Variable	Adjusted Odds Ratio (AOR)	95% CI for OR	p-value
Age	0.898	[0.757, 1.064]	0.214
Gender			
Male	1.000 (Reference)	-	-
Female	2.399	[1.458, 3.946]	<0.001
Academic year			
1st year	1.000 (Reference)	-	-
2nd year	1.297	[0.646, 2.604]	0.464
3rd year	2.028	[0.888, 4.633]	0.094
4th year	2.337	[0.908, 6.012]	0.078
5th year	4.246	[1.267, 14.221]	0.019
Marital status			
Not married	1.000 (Reference)	-	-
Married	0.657	[0.122, 3.525]	0.624
Chronic disease			
No	1.000 (Reference)	-	-
Yes	0.780	[0.365, 1.667]	0.522
Exercise			
No	1.000 (Reference)	-	-
Yes	1.203	[0.677, 2.136]	0.529

Table 4: The Mean Scores and Standard Deviations of GPA Across GAD Severities.

GAD severities	GPA Mean	Standard deviation	p value
No Anxiety	3.23	0.623	0.160
Mild Anxiety	3.32	0.469	
Moderate Anxiety	3.16	0.512	
Severe Anxiety	3.26	0.491	

Table 5: The Impact of GAD Severity on Daily Life Activities

Description	Mean	Standard Deviation	p-value	Effect Size
If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?				
Not difficult at all	4.1089	3.67124	<0.001	0.380
Somewhat difficult	6.8653	3.25360		
Very difficult	11.9545	3.94706		
Extremely difficult	11.8056	3.60015		