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ORIGINAL ARTICLE

COMPARISON OF PSYCHOLOGICAL STATUS AMONG PRECLINICAL AND CLINICAL MEDICAL STUDENTS WITH GENDER DIFFERENCES

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ABSTRACT

Background: The rigorous curriculum and high-stakes environment of medical school can significantly impact students' psychological well-being. This study assessed the correlation of preclinical, clinical year students, and their gender with depression, anxiety, and stress among medical students.

Materials & Methods: A cross-sectional study was performed on 351 medical students in the Physiology Department, College of Medicine, from January 2022-April 2022. A predesigned questionnaire including sociodemographic characteristics and Depression, Anxiety, Stress Scale (DASS) was distributed to medical students.

Results: The preclinical year students show prevalence of depression 67.5%(n=166), anxiety 76.8%(n=189), and stress 56.5%(n=69) compared to clinical year students (69.5%(n=73), 74.2%(n=78), and 44.7%(n=47)) respectively. The statistical differences between the two groups in anxiety is $p=0.044$ and in stress its $p=0.051$. The preclinical year students show severe anxiety (50.0%, n=123) compared to the (35.3%, n=37) of clinical year students. Regarding gender, there is a difference in anxiety between male 68.0%(n=132) and female 85.9%(n=135) with p value of less than 0.001, but there are no differences in the prevalence of depression and stress among male and female medical students (62.3%(n=121) vs 75.1%(n=118) with $p=0.069$ and 47.9%(n=93) and 59.2%(n=93) with $p=0.138$ respectively. It also shows (51.5%,n=81) female students were severely anxious while male students were less severely anxious (40.7%, n=79). The mean of the total sample size depression score is 16.3 (moderate degree), the mean of the total sample size anxiety score is 16.3 (severe degree of anxiety), and the mean total sample size stress score is 17.3(mild degree).

Conclusions: Our findings include high prevalence of psychological disorders in preclinical year when compared to clinical year and female students when compared to male. Both findings could have adverse effects on student performance, teaching staff performance, and the academic environment as a whole. As a leading college, medical schools should take this alarming message into consideration and work on reconstructing a healthy academic environment. We recommend the decision makers to focus on shifting the academic attention to the quality rather than quantity.

KEW WORDS: Anxiety; Depression; Gender; Medical students; Questionnaire; Test.

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INTRODUCTION

Medical students have been consistently identified as a population at high risk for experiencing significant psychological distress throughout their academic careers.[1-2] A multitude of factors have been implicated in this phenomenon, including academic workload, performance expectations, personal life stressors, fear of educational failure, career uncertainty, exhaustion, frequent examinations, financial concerns, language barriers, inadequate textbooks, fac-

ulty interactions, and poor time management skills.[3-5] The cumulative impact of these stressors can lead to the development of psychological disorders, such as depression, anxiety, and stress.[6]

Previous studies have highlighted the prevalence of depression, anxiety, and stress among medical students, emphasizing their detrimental effects on overall health.[6] Literature search has revealed that private medical university students exhibit higher levels of depression, anxiety, and stress compared to their counterparts in public universities.[7] Furthermore, Previous studies show a disproportionate impact of psychological distress on low-income medical students.[8] The academic journey of medical students is characterized by distinct phases, with preclinical and clinical years presenting unique challenges. The transition between these stages may influence student satisfaction and psychological well-being. Additionally, gender disparities in psychological health outcomes among medical students warrant investigation. Medical school administrations recognize the importance of cultivating psychologically stable physicians with sound judgment to ensure the delivery of high-quality healthcare.[9] Psychological stability not only affects personal life but also has a profound impact on future professional productivity. To address these concerns, this study aimed to investigate the relationship between preclinical and clinical years, gender, and the prevalence of depression, anxiety, and stress among medical students.

MATERIAL AND METHODS

A cross-sectional study was conducted within the Department of Physiology at the College of Medicine, from January to April 2022. A convenience sampling approach was employed to recruit participants.

Inclusion criteria were restricted to medical students currently enrolled in years 1-5 at the College of Medicine. Students from other colleges or those who had already graduated were excluded. Online Google questionnaires were disseminated to all medical students registered with the Student Affairs office.

The questionnaire comprised two sections: sociodemographic characteristics and the Depression, Anxiety, Stress Scale (DASS-21). The DASS-21 is a well-established and validated instrument for measuring psychological well-being parameters and has been widely utilized in research [15]. The scale consists of three subscales: depression, anxiety, and stress, each comprising seven items. DASS-21 scores were interpreted using the following classification: Normal (depression 0-4, anxiety 0-3, stress 0-7), Mild (depression 5-6, anxiety 4-5, stress 8-9), Moderate (depression 7-10, anxiety 6-7, stress 10-12), Severe (depression 11-13, anxiety 8-9, stress 13-16), and Extremely Severe (depression 14+, anxiety 10+, stress 17+).

A pilot study was conducted to assess potential misunderstandings. Per ethical guidelines, participants were informed of their voluntary and anonymous participation. Completing the questionnaire served as a form of informed consent. The study was approved by the College of Medicine Research Center (Institutional Review Board) at the King Saud University (KSU) (E-21-6431).

The Statistical Package for Social Sciences (SPSS) 25 version was used to analyze the variables' frequencies, percentages means, and standard deviations as descriptive measures. In addition, Pearson's Chi-square and T-tests were applied to assess the correlation between study variables and DASS. The eta ratio was used to determine the degree and the strength of association between the nominal variables (age, medical year, gender) and the dependent variables (DASS).

RESULTS

The students returned 351 questionnaires with their responses. Demographic characteristics of sample size is shown in table 1. Shown on table 2, the total sample size shows prevalence of depression 68.0%(n=239), anxiety 76.0%(n=267), and stress 52.9%(n=186). The prevalence of depression in preclinical year students is 67.5%(n=166), anxiety 76.8%(n=189), and stress 56.5%(n=69) while for the clinical year students 69.5%(n=73), 74.2%(n=78), and 44.7%(n=47) respectively with more prevalence in preclinical year students (statistical differences between the two groups in anxiety (p=0.044) and stress (p=0.051)). The preclinical year students show severe anxiety (50.0%, n=123) compared to the (35.3%, n=37) of clinical year students.

Table.1 Characteristics of sample size (N=351)

Variables		Total number	%age
Age in year	<23	303	(86.3)
	≥23-25	48	(13.7)
Gender	Male	194	(55.3)
	Female	157	(44.7)
Medical year of student	Preclinical years	246	(70.1)
	Clinical years	105	(29.9)
Region	Central region	188	(53.5)
	Eastern region	61	(17.4)
	Western region	29	(8.3)
	Northern region	52	(14.8)
	Southern region	21	(6.0)

Regarding gender, table 3 shows the statistically significant difference in anxiety between male 68.0%(n=132) and female 85.9%(n=135) with $p < 0.001$. In regards to

gender, it also shows (51.5%, n=81) female students were severely anxious while male students were less severely anxious (40.7%, n=79).

Our results show the correlation between independent variables and depression, anxiety, and stress by (eta ratio) as follows: Age and depression (0.120), anxiety (0.126), stress (0.146), showing high correlation with age (the older the students, the more prevalence). Medical year and depression (-0.005), anxiety (-0.044), stress (-0.006) with no correlation. Gender and depression (0.138), anxiety (0.185), stress (0.122) with high correlation between female and prevalence.

As shown in table 4, our data show the mean of the total depression score is 16.3±11.8 (moderate degree of depression). The mean of the total anxiety score is 16.3±11.4 (severe degree of anxiety), and the mean total stress score is 17.3±10.5 (mild degree of stress).

Table 5 shows the total depression score of males is 14.8±11.5 and for females is 18.1±11.9 with p=0.009, total anxiety score for male is 14.2±11.3 and for female 18.4±11.0 with p-value <0.001, and total stress score for male is 16.2±10.6 and for female 18.7±10.1 with p=0.022.

Table 2: Descriptive statistics of preclinical (n=246) and clinical year students (n=105) and DASS.

Descriptive statistics	Year	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	P value
Depression	Preclinical	80(32.5)	24(9.8)	58(23.6)	84(34.1)	0.488
	Clinical	32(30.5)	8(7.6)	34(32.4)	31(29.5)	
Anxiety	Preclinical	57(23.2)	17(6.9)	49(19.9)	123(50.0)	0.044*
	Clinical	27(25.7)	7(6.7)	34(32.4)	37(35.3)	
Stress	Preclinical	107(43.5)	31(12.6)	46(18.7)	62(25.2)	0 .051*
	Clinical	58(55.2)	13(12.4)	8(7.6)	26(24.7)	

* Statically significant at p value<0.05 using Pearson's Chi-square test.

Table 3: Descriptive statistics of gender (Male=194, Female=157) and DASS.

Descriptive statistics	Gender	Normal n(%)	Mild n(%)	Moderate n(%)	Severe n(%)	P value
Depression	Male	73(37.6)	16(8.2)	50(25.8)	55(28.4)	0.069
	Female	39(24.8)	16(10.2)	42(26.8)	60(38.2)	
Anxiety	Male	62(32.0)	15(7.7)	38(19.6)	79(40.7)	<.001*
	Female	22(14.0)	9(5.7)	45(28.7)	81(51.5)	
Stress	Male	101(52.1)	22(11.3)	26(13.4)	45(23.2)	0 .138
	Female	64(40.8)	22(14.0)	28(17.8)	43(27.4)	

* Statically significant at p value<0.05 using Pearson's Chi-square test.

Table 4: Descriptive statistics of preclinical and clinical years and DASS, N=351.

Descriptive statistics	Total sample size score n=351	Preclinical n=246	Clinical n=105	P value
Total depression Mean ±SD	16.3±11.8	16.0±12.3	16.6±11.4	0.544
Total anxiety Mean ±SD	16.3±11.4	15.8±11.8	16.8±11.1	0.767
Total stress Mean ±SD	17.3±10.5	17.6±10.6	17.1±10.4	0.711

Table 5: Descriptive statistics of gender and DASS, N=351.

Descriptive statistics	Total sample size score n=351	Male n=194	Female n=157	P Value
Total depression Mean ±SD	16.3±11.8	14.8±11.5	18.1±11.9	<0.009*
Total anxiety Mean ±SD	16.3±11.4	14.2±11.3	18.4±11.0	<0.001*
Total stress Mean ±SD	17.3±10.5	16.2±10.6	18.7±10.1	<0.022*

SD standard deviation, * Statically significant at p value<0.05, student`s t-test.

DISCUSSION

Our findings underscore the pervasive nature of psychological distress among medical students, with a substantial proportion reporting high levels of depression (68.0%), anxiety (76.0%), and stress (52.9%). These rates are significantly higher than those observed in the general population, highlighting medical students' unique challenges.

The literature on the transition from preclinical to clinical years, as well as gender differences in psychological well-being among medical students, remains inconclusive. Our results indicate that preclinical year students experience a higher prevalence of depression (67.5%), anxiety (76.8%), and stress (56.5%) compared to their clinical year counterparts (69.5%, 74.2%, and 44.7%, respectively). This maybe attributed to the novel academic environment and increased challenges preclinical students encounter. Conversely, the lower rates observed in clinical year students could suggest adaptation to the educational demands over time.

A particularly striking finding is the high prevalence of severe anxiety among preclinical year students (50.0%) compared to clinical year students (35.3%). Our results diverge from those of Ludwig et al.[10] Who reported a 17% increase in depression from the first to the third year. This discrepancy may be attributed to the accumulating effects of stress and the potential for unresolved psychological distress over time. Other studies have corroborated the association between intense medical training, high-performance expectations, and increased psychological strain.[11-12]

In contrast to our findings, some studies conducted in Saudi Arabia and India have observed decreased depression among medical students as they progress towards the fifth year, potentially due to adaptation to the demanding curriculum.[13-14] Nimkuntod et al.[15] identified the second year of medical school as a particularly challenging period characterized by heightened levels of depression, anxiety, and stress.

The relationship between gender and psychological well-being among medical students is a subject of ongoing debate. While some studies have reported higher rates of depression in female medical students.[16-17] Others have found no significant gender differences.[13-18] Inam et al;[19] observed a higher prevalence of anxiety in female medical students during their first year (89.7%) compared to male students (60%). However, a study conducted in Makkah, Saudi Arabia, revealed higher levels of depression and anxiety among male medical students.[20] Our results align with previous research, demonstrating a higher prevalence of anxiety in female students (85.9%) compared to male students (68.0%). Furthermore, a significantly more significant proportion of female students (51.5%) exhibited extremely severe anxiety compared to male students (40.7%).

Our study also identified a strong correlation between depression, anxiety, stress, age, and female gender. Older students may experience increased stress due to heightened responsibilities and academic pressures.

Our findings highlight the alarmingly high rates of psychological disorders among medical students, regardless of gender. The mean scores for depression, anxiety, and stress were significantly elevated, indicating moderate to severe levels of distress. While no significant differences were observed between preclinical and clinical year students, female students exhibited considerably higher scores than male students.

Study limitations: Several limitations should be acknowledged. Most participants were from preclinical years, limiting our ability to assess satisfaction levels across all educational stages. Additionally, over 80% of participants were 22 years old or younger, which may affect the generalizability of our findings. Moreover, the cross-sectional design of the study precludes causal inferences.

CONCLUSIONS AND RECOMMENDATIONS

Our findings underscore the urgent need for intervention to address the disproportionate prevalence of psychological disorders among preclinical year students and female medical students. The alarming rates observed in these subgroups suggest a critical need to implement comprehensive monitoring tools to identify and support at-risk students.

The data presented in this study serves as a stark reminder of the pressing challenges medical students face and the necessity for a fundamental reevaluation of the academic environment. Prioritizing quality over quantity within medical colleges should be a paramount objective, as well as fostering a supportive and conducive learning environment that mitigates psychological problems among students. This shift in focus is imperative for decision-makers to ensure the well-being and resilience of future physicians.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	TAK, MMK
Acquisition, Analysis or Interpretation of Data:	TAK, MMK, SSH
Manuscript Writing & Approval:	TAK, MMK, SSH

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.