

Evaluation of depression symptoms and depression literacy among medical students: a cross-sectional study

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Abstract. – OBJECTIVE: Mental health plays an important role in educational performance. The present study aimed to determine the relationship between depression symptoms, depression literacy, and quality of life in undergraduate and postgraduate medical students in the Kingdom of Saudi Arabia.

SUBJECTS AND METHODS: This cross-sectional survey was conducted in 2023 in Riyadh with 263 medical students. Data were obtained using three different sets of questionnaires (a demographic section, the Depression Literacy Scale, and a quality-of-life questionnaire).

RESULTS: In total, 134 men (51%) and 129 women (49%) participated in the study; out of these, 142 participants reported depression, while 109 individuals reported family-related depression. Only 25% of the participants attended depression seminars and workshops in the last year, while 83% felt that depression was an illness. Students with a family history of depression also reported higher levels of depression. Depression was lowest among students who attended depression management seminars or workshops. Marital status did not affect depression among medical students.

CONCLUSIONS: These findings reveal that depression is widespread among medical students and that counseling and frequent depression assessments are required. There is a need for greater awareness of different aspects of depression among medical students, parents, and medical educators. Health education programs and interventions targeting mental health care can be implemented at the individual, family, and community levels.

Key Words:

Quality of life, Health education, D-Lit scale, Mental health, Counseling.

Introduction

The World Health Organization (WHO) defines mental health as a state of mental well-being

that enables people to cope with the stresses of life, realize their abilities, learn and work effectively, and contribute to their community¹. Additionally, it is argued that simply being “not depressed” is not the final objective in achieving mental health because well-being functions like a scale, with sickness at one end of the spectrum and optimal well-being at the other. The WHO states that mental health problems are among the most important factors contributing to morbidity and disability. Furthermore, depression has been identified as one of the most significant contributors to mental health disorders^{2,3}.

It is estimated that five percent of adults suffer from depression worldwide⁴. It is characterized by feelings of continuous melancholy, as well as a loss of interest or pleasure in activities that were rewarding or enjoyable previously. Moreover, it may disrupt both sleep and appetite⁵. Typical symptoms include feeling tired and having trouble concentrating. Depression has been identified as the main cause of disability worldwide and is also a significant contributor to the overall burden of disease⁶. The effects of depression can be lasting or recurrent, and they have the potential to significantly impact a person’s capacity to function and lead a satisfying life. There is a complex interplay between social, psychological, and biological factors in the development of depression. The experience of adversity in infancy, loss, and unemployment are all life situations that can contribute to and possibly catalyze the development of depression^{7,8}.

Concerns regarding the psychological well-being and mental health of university students are increasingly being raised as a matter of public health concern worldwide⁹. Medical school students have been found to have an increased likelihood of developing depression¹⁰. It has also been found that the average amount of stress experienced by medical students is significantly higher than that of the general population^{11,12}.

The Bachelor of Medicine and Bachelor of Surgery (MBBS) is an undergraduate curriculum in Saudi Arabia that lasts for seven years and includes one year of clinical rotation¹³. Postgraduate (Specialized Health Care) programs also last for four to six years, depending on the area of specialization¹⁴. Stress builds up for medical students over the course of their training if they struggle to meet all their goals and requirements or if they have trouble in their social and family life¹⁵. This leads to feelings of helplessness, anxiety, and depression among students. Throughout medical training, the materials recommended for acquiring professional knowledge are dense and continue to expand annually. Furthermore, depression is a prevalent problem among medical students in Saudi Arabia. Hence, the purpose of the present study is to establish a correlation between symptoms of depression, literacy pertaining to depression, and the quality of life among medical students pursuing postgraduate and undergraduate programs in the Kingdom of Saudi Arabia.

Subjects and Methods

Study Design, Sample Size, and Sampling Method

This cross-sectional study was conducted in 2023 at three universities in Riyadh, Kingdom of Saudi Arabia. Ethical approval for the study was obtained from the Institutional Review Board at King Khalid University Hospital (Protocol No. 17/0072/IRB). In total, 263 medical students participated. This sample size was based on previous research and had a 95% confidence level. Participants were recruited using a multi-stage sampling procedure. In the first stage, a proportionate stratified sampling was utilized, and in the second stage, simple random sampling was utilized. The proportionate stratified sampling approach required the identification of all health facilities and medical education institutes, together with their respective populations. Subsequently, each facility was treated as a stratum in the methodology. Next, the required sample size was selected from each stratum by conducting simple random sampling among those who met the inclusion criteria and were willing to participate in the study. After providing participants with an explanation of the study goal, they were given a self-report questionnaire. Participants had to be at least 18 years old and free from chronic medical conditions, should have signed an informed consent form,

and studied at either the undergraduate (MBBS) or postgraduate (specialization) level to be considered for inclusion in this study.

Data Collection

Data were collected using three sets of questionnaires: a demographic questionnaire, a Depression Literacy (D-Lit) questionnaire, and a quality-of-life questionnaire.

1) In the demographic questionnaire section, data on the following were obtained: sex, job status, marital status, age group, income, education level, and family history of mental illness. We also asked participants whether they had consulted psychologists or psychiatrists for psychological issues, obtained information related to mental illness, or referred a family member to a psychologist or psychiatrist for psychological issues.

2) D-Lit questionnaire was conceived and validated by Griffiths et al¹⁶. It consists of 22 questions that survey an individual's current state of mental health knowledge and literacy regarding depression. These questions were graded on a scale with three possible answers – true, false, and “I do not know” – and had a possible range of scores from 22 to 66. A point was deducted from the total score for each incorrect response, and a higher total score indicated a lower D-Lit status¹⁷. The validity and reliability of the D-Lit questionnaire were tested.

3) The Quality of Life Questionnaire (Modified SF-12) was conceptualized by Ware et al¹⁸. The questionnaire used in this study was a condensed version of the full quality-of-life questionnaire, which originally contained 25 items and eight subscales¹⁸. This instrument evaluates quality of life based on factors such as limitations in roles due to physical problems (questions RP-2 and RP-3), bodily pain (question BP-1), physical functioning (questions PF-2 and PF-2), limitations in roles due to emotional problems (questions RE-2 and RE-2), general health (questions GH-1 and GH-1), social functioning (questions SF-1 and SF-1), vitality (questions VT-1 and VT-1), and perceived mental health (MH-2 questions). These eight variables were broken down into two subscales: one for physical health, with a total of six items (RF, RP, BP, and GH), and another for mental health, with a total of six items (SF, RE, VT, and MH).

Statistical Analysis

The data were analyzed through IBM SPSS v27 software (IBM Corp., Armonk, NY, USA). Descriptive statistics were employed to compile

the socio-demographic characteristics of the sample, alongside the rates of depression and depression literacy. The Pearson product-moment correlation coefficient was used to measure the association between depression symptoms, depression literacy, and quality of life. Additionally, the *t*-test was applied to determine the difference between center epidemiological depression and symptoms of depression on the measures of gender, depression self-rating, and depression literacy. Statistical significance was established at a *p*-value lower than 0.05.

Results

Section I: Descriptive Statistics

Table I describes the frequency, percentage, and cumulative percentages of the following: gender, marital status, year of study, faculty, self-rated personal depression in the past year, and number of family members of the participants. Male participants constituted 51% (n=134) while females represented 49% (n=129). There were 136 students from the College of Applied Medicine, 15 from the College of Pharmacy, and 6 from the College of Dentistry. A total of 27 participants were 1st-year students, 19 were 2nd year, 44 were 3rd year, 56 were 4th year and 35 were 5th year; 5 participants were interns.

As many as 142 participants reported experiencing personal depression, whereas 121 did not report depression. One hundred nine participants reported depression among family members, while 154 did not. Eighty-three percent of the participants were aware that depression is an illness, whereas 16% were not. Twenty-five percent of the participants claimed to have attended depression-related seminars in the previous year, while 74% of the participants did not.

Section II: Correlation Analysis

Table II describes the Pearson product correlation of the study measures. The results showed that epidemiological depression was significantly associated with the symptoms of depression.

Section III

t-test of gender

According to the results of Table III, when assessing understanding of depression, it was found that females were significantly associated with epidemiological depression ($p < 0.001$).

Attending seminars

According to the results in Table IV, there was no significant association between participants not attending depression-related seminars and depression ($p = 0.058$) compared to others who attended these seminars and had an understanding of depression.

Self-rated depression in a family member in the past year

According to the results of Table V, a significant association was found between participants who reported depression in their family and personal epidemiological depression ($p < 0.001$).

Awareness on depression

According to the results in Table VI, it was found that participants who attended seminars or had insights related to depression through social media or other platforms demonstrated a better understanding of depression ($p = 0.027$).

Self-rated personal depression

According to the results of Table VII, it was found that personal depression on a self-reported scale ($p < 0.001$) was significantly associated with epidemiological depression.

Discussion

The results showed that epidemiological depression was significantly associated with depression symptoms. Moreover, it has been observed that female medical students suffer from more severe epidemiological depression than male students. Students who attended seminars or training workshops related to depression management reported lower levels of depression compared to those who did not participate in such training or workshops, although the difference between the two groups did not achieve statistical significance. Furthermore, these participants were more likely to have insights into depression through social media and other platforms. Similarly, having a family history of depression showed a significant association with epidemiological depression. Participants who self-reported personal depression on a scale showed a significant association with epidemiological depression.

The findings of this study are in agreement with those of earlier studies¹⁹ that found a high frequency of depression in women. This may be because perceptions of traditional masculinity and femininity can influence individuals' attitudes

Depression symptoms and literacy among medical students

Table I. Frequencies, percentages, and cumulative percentages of control variables (N=263).

	Frequency	Percent	Valid percent	Cumulative percent
Gender				
Male	134	51.0	51.0	51.0
Female	129	49.0	49.0	100.0
Total	263	100.0	100.0	
Marital status				
Single	248	94.3	94.3	94.3
Married	15	5.7	5.7	100.0
Total	263	100.0	100.0	
Faculty				
College of Medicine	67	25.5	25.5	25.5
College of Dentistry	45	17.1	17.1	42.6
College of Pharmacy	15	5.7	5.7	48.3
College of Applied Medical Sciences	136	51.7	51.7	100.0
Total	263	100.0	100.0	
Year of study				
1 st	27	10.3	10.3	10.3
2 nd	19	7.2	7.2	17.5
3 rd	44	16.7	16.7	34.2
4 th	56	21.3	21.3	55.5
5 th	35	13.3	13.3	68.8
6 th	37	14.1	14.1	82.9
Internship	45	17.1	17.1	100.0
Total	263	100.0	100.0	
Self-rated depression in the past year, personal				
Yes	142	54.0	54.0	54.0
No	121	46.0	46.0	100.0
Total	263	100.0	100.0	
Self-rated depression in the past year, family member				
Yes	109	41.4	41.4	41.4
No	154	58.6	58.6	100.0
Total	263	100.0	100.0	
Depression is an illness like other physical illnesses				
Yes	220	83.7	83.7	83.7
No	43	16.3	16.3	100.0
Total	263	100.0	100.0	
Did you hear about any seminars, workshops, or other programs (from friends, social media, etc.) related to depression or mental health during the past year?				
Yes	137	52.1	52.1	52.1
No	126	47.9	47.9	100.0
Total	263	100.0	100.0	
Did you attend any seminars, workshops, or other programs related to depression or mental health during the past year?				
Yes	66	25.1	25.1	25.1
No	197	74.9	74.9	100.0
Total	263	100.0	100.0	

Table II. Pearson correlation of center epidemiological depression and symptoms of depression (N=263).

Correlations		Total center epidemiological depression	Symptoms of depression
Total center epidemiological depression	Pearson's Correlation	-	.048*
Symptoms of depression	Pearson's Correlation	.048*	-

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table III. *t*-test of center epidemiological depression and symptoms of depression on the measure of gender (N=263).

	<i>t</i> -test for equality of means					95% confidence interval of the difference	
	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Total center epidemiological depression	-3.876	260.510	.000***	-4.790	1.230	-7.220	-2.350
Symptoms of depression	-.919	248.090	.359 (ns)	-.720	.780	-2.270	.820

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ns = not significant.

Table IV. *t*-test of center epidemiological depression and symptoms of depression on the measure of seminars attending (N=263).

	<i>t</i> -test for equality of means					95% confidence interval of the difference	
	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Total center epidemiological depression	-1.166	100.385	.246 (ns)	-1.824	1.565	-4.929	1.280
Symptoms of depression	-1.916	96.621	.058	-1.909	.996	-3.886	.068

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ns = not significant.

Table V. *t*-test of center epidemiological depression and symptoms of depression on the measure of self-rated depression in the past year, family (N=263).

	<i>t</i> -test for equality of means					95% confidence interval of the difference	
	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Total center epidemiological depression	3.610	205.260	.000***	4.692	1.299	2.131	7.252
Symptoms of depression	-1.560	219.570	.110 (ns)	-1.277	.814	-2.880	.327

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ns = not significant.

and behaviors toward life experiences^{20,21}. Further, after completing a year of clinical training, students can adjust to stressful environments better, as evidenced by lower levels of depression in the fourth year of MBBS²². However, due to the increased workload in the fifth and final years of medical school, the risk of depression increases.

Anxiety and depression can lead to a variety of unfavorable outcomes for students – they may drop out of medical school, have diminished capacity for effective work, experience deterioration of relationships, burnout, an increased likelihood of suicidal ideation, as well as problems already present in healthcare provision²³.

Table VI. *t*-test of center epidemiological depression and symptoms of depression on the measure of insight about depression (N=263).

	<i>t</i> -test for equality of means					95% confidence interval of the difference	
	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Total center epidemiological depression	.830	260.620	.404 (ns)	1.062	1.270	-1.438	3.563
Symptoms of depression	-2.220	259.260	.027*	-1.751	.787	-3.300	-.202

p*<0.05, *p*<0.01, ****p*<0.001; ns = not significant.

Table VII. *t*-test of center epidemiological depression and symptoms of depression on the measure of personal self-reported depression in the last year (N=263).

	<i>t</i> -test for equality of means					95% confidence interval of the difference	
	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Total center epidemiological depression	6.057	256.700	.000***	7.100	1.172	4.792	9.409
Symptoms of depression	.151	258.200	.880 (ns)	.120	.792	-1.440	1.680
Symptoms of depression	Between groups	6.150	1	6.150	.149	.700 (ns)	
	Within groups	10,794.800	261	41.350			
	Total	10,800.950	262				

p*<0.05, *p*<0.01, ****p*<0.001; ns = not significant.

Our results are consistent with those of Al-sofyani et al²⁴, who conducted a study on students in their fourth year at Taif University. This survey comprised 81 medical students and approximately 100 students studying medical sciences. The researchers composed an entirely new inventory to conduct the prevalence analysis. They found a prevalence rate for depression of 34% overall (41% for medical students and 28% for medical sciences students).

Our results are also supported by the findings of Alkot et al²⁵ and Goweda et al²⁶. They conducted a study to compare the rates of depression experienced by medical and non-medical students. Students from the College of Medicine (103 men vs. 77 women), the College of Islamic Studies (107 men vs. 70 women), and

the College of Engineering and Islamic Architecture (95 male students only) participated in the study. The ratio of male to female participants was determined based on the number of students enrolled in each college. Depression rates were as follows among the students: mild mood disturbance, 29.7%; borderline depression, 29.7%. Among males, 31.2% showed evident depression, with 11.8% showing borderline clinical depression, 13.2% moderate depression, 4.9% severe depression, and 1.3% extremely severe depression. Among females, 26.4% showed evident depression, with 11.5% showing borderline clinical depression, 12.8% moderate depression, 1.4% severe depression, and 0.7% extremely severe depression. The Faculty of Medicine, the College of Enginee-

ring and Islamic Architecture, and the College of Islamic Architecture had a high rate of depression (34.5 %), while the College of Islamic Studies had a rate of 22.7%²⁵.

The findings of this study, and the broader literature in general, highlight a pressing need for increased attention to the emotional and mental health of medical students. It has been stated that medical students are often reluctant to seek adequate care for difficulties related to their mental health because they regard doing so as a sign of weakness. This issue needs to be addressed, and students should be encouraged to seek help. When they do, proper facilities should be provided for them²⁷. It is possible that arming people with knowledge about the effective methods of coping with stress (i.e., active coping efforts) and the methods that do not work (i.e., avoidant coping attempts) could be beneficial in preventing suffering. Medical school students should be encouraged to devote sufficient time to their personal and social lives, and they should be made aware of the significance of developing coping mechanisms that are beneficial to their health. In light of this, there ought to be provisions on campus for recreational activities^{28,29}. The implementation of preventive programming should begin at an early stage in the education of medical professionals and should address a wide range of concerns, including academic, interpersonal, and economic issues³⁰. Among medical students, it is imperative to consider the earliest indicators of depressive symptoms. We need interventions that assist students in managing stress to seamlessly transition from high school to medical college and for them to adjust to different learning settings throughout the various phases of medical education³¹.

Limitations

This study has some limitations. There was a lack of population-based data to support our findings and compare them with those of the general population. Furthermore, there was a lack of baseline information concerning the mental status of medical students at the time of entrance into medical school. To improve the mental health of students, baseline data should be collected at the time of enrollment, and positive instances should be sent to a psychiatrist for additional evaluation. The implementation of interventional treatments will be aided by follow-up studies that assess the prevalence of mental health conditions, including anxiety and depression.

Conclusions

This study has demonstrated the need to increase knowledge concerning the symptoms and indicators of depression among medical students and other stakeholders, such as parents and medical educators. Additionally, it highlights that effective techniques for delivering mental health care to undergraduate and postgraduate medical students can be delivered at the individual, family, and community levels through health education programs and interventions. It is necessary to conduct research with large sample sizes as well as multicentric longitudinal research to assess the incidence of depression among medical students in Saudi Arabia on a large scale, as well as the associated risk factors.

Informed Consent

Each participant provided written informed consent subsequent to a thorough discussion regarding the study objectives and procedures, and prior to their enrollment in the research.

Ethics Approval

The protocol for this study was reviewed and approved by the Institutional Review Board at King Khalid University Hospital (Protocol No. 17/0072/IRB). All procedures were performed in conformity with the ethical standards of the Declaration of Helsinki 1975 and its later amendments.

Authors' Contributions

The author of this study, Mazyad A. Alotaibi, takes full responsibility for the conception, design, data collection, analysis, interpretation, and writing of the manuscript.

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Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this work.

Data Availability

The data underpinning the findings of this study are accessible upon a reasonable request directed to the corresponding author.

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