

# Prevalence and predictors of depression among medical students in Jeddah, Saudi Arabia

Yousria Badawy (1)  
 Areej Alsaggaf (2)  
 Amani Bardi (2)  
 Omnia Alganmi (2)  
 Turki Alshehri (2)

(1) Professor of Family Medicine, College of Medicine, Ibn Sina National College for Medical studies

(2) Medical intern, Ibn Sina, National College for Medical studies

## Corresponding author:

Areej Alsaggaf  
 Jeddah, Saudi Arabia  
 Mobile:00966532684559  
 Email: Areej.hs@outlook.com

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## Abstract

**Background:** Estimates of the prevalence of depression or depressive symptoms among medical students varies across studies from 1.4% to 73.5%. Studies also report conflicting findings about if student depression vary by undergraduate year, sex, or other characteristics.

**Objective:** to assess the prevalence and factors associated with depression among medical students in Jeddah, Saudi Arabia.

**Methods:** Institutional based cross-sectional study was conducted among medical students at Ibn Sina National College of Medical Science of Jeddah, Saudi Arabia. The presence of depression and its severity was based on PHQ depression scale (PHQ-9) 19, using Google form link. Data was collected using data on the outcome of interest (depression), socio-demographic characteristics (age, sex, source of income and marital status), academic-related factors (academic year of study).

**Results:** Depression was detected in 75.31% of the studied population, considering 10 score as a cut off point for depression. Among those depressed groups 23.44% were scored as having moderate depression (10-14) while those who had moderately severe (15-19) and severe (20 or more) were 28.93% and 22.94% respectively. The present study showed that depression was significantly more prevalent among female medical students compared to male medical students. The prevalence of depression was more in the second year medical students followed by the sixth year and the difference found between the severity of depression and year of studying was statistically significant.

**Conclusion:** Depression is highly prevalent among medical student populations. Implications of depression are of serious concern that could result in loss of potential to handle various stressors at college, impairment of functioning in classroom performance and later in clinical practice.

**Key words:** Saudi. Depression, medical students, prevalence & severity

## Introduction

The WHO considers mental health as a fundamental aspect of human health and published an action plan for 2013–2020 to promote the prevention, treatment, and overcoming of mental health disorders(1). Depression is considered an important indicator for mental health, and the inability to detect and address this psychological disorder negatively affects individuals(2,3).

University students face various stressors such as academic requirements, time pressure and social adjustments, and medical students in particular, may face additional challenges such as the large workload, the time commitment and the number of assessments, as well as the pressures of a clinical environment(4). Studies have suggested that medical students experience high rates of depression(5). However, estimates of the prevalence of depression or depressive symptoms among medical students vary across studies from 1.4% to 73.5%(6,7). Studies also report conflicting findings about if student depression vary by undergraduate year, sex, or other characteristics(8-11).

A recent meta-analysis showed that depression affects approximately one third of medical students worldwide, (12). It is also likely that the overall prevalence of depressive symptoms among medical students is higher than that reported in the general population(13). As most of the studies revealed that depression is common in university students especially high among medical students they also found no preponderance between males and females and is higher in single students than married ones(14,15). It may be a significant hidden problem in medical students and mechanisms to identify and help students with mental health problems should be seriously considered(16).

Depression has a huge effect on society and individuals, which can lead to suicidal tendency, relationship problems, medical dropouts, and impaired work ability. Therefore, proper counseling services are required for the psychological well-being of medical students to improve their quality of life(17).

Even though depression is found to be remarkably high among medical students coupled with its impacts in causing poor academic performance, disability and poor quality of life, to our knowledge only a few studies are available in the study area (Saudi Arabia). A better understanding of the magnitude and correlates of depression is essential for planning appropriate intervention for those population groups.

Therefore, this study aimed to assess the prevalence and factors associated with depression among medical students in Jeddah, Saudi Arabia.

This study aimed to determine the prevalence and associated factors of depression among undergraduate medical students at Ibn Sini National Medical college, Jeddah, Saudi Arabia.

## Methodology

### Study design and setting:

Institutional based cross-sectional study was conducted among medical students at Ibn Sina National College of Medical Science of Jeddah, Saudi Arabia. The study was conducted between October to December 2019.

### Sample population:

The Sample size was determined based on a single population formula using Epi-info version 7 with a 95% confidence interval and 5% margin of error taking the prevalence of depression as 27.7% . By considering a 10% non-response rate and applying sample correction formula a total sample size of 400 undergraduate medical students were involved in the study. The study population consisted of male and female medical students , attending the medicine program of all academic stages (from year one till year six). Students with known depression or under anti-depressive medications were included. Students with other known psychiatric illnesses other than depression, and chronic medical conditions known to be associated with depression (diabetes, rheumatoid, etc) were excluded.

### Data collection:

The presence of depression and its severity was based on PHQ depression scale (PHQ-9) (18), using Google form link developed by Kroenke et al to measure depression. It was self-administered, and facilitated diagnosis of major depression and also provided assessment of symptom severity. The PHQ-9 is the depression module, which scores each of the nine criteria as "0" (not at all) and "3" (nearly everyday). Validity of this test has been assessed against an independent structured mental health professional (MHP) interview. PHQ-9 score of ten or more had a sensitivity of 88% and a specificity of 88% for major depression. It has been validated for use in primary care. Data was collected using data on the outcome of interest (depression), socio-demographic characteristics (age, sex, source of income and marital status), academic-related factors (academic year of study). The screening instrument assesses depressive symptoms based on nine questions for screening ,diagnosing, monitoring and measuring the severity of depression level using the cutoff values of 10 to 14 dysthymia (minor depression) and 15 or above were considered to define major depression among medical students. According to the cutoff scores, students were classified as normal( 0-4), mild (5-9), moderate (10-14), severely moderate (15-19) and severe (20 or more ) depression

### Ethical consideration:

Approval for this study was obtained from the ethics committee of Ibn Sini National College of Medical Science. All information obtained was kept confidential. Data collection sheet also included a consent to participation.

### Data analysis:

The data was analyzed by using Statistical Package for Social Sciences (SPSS-22). The frequency and percentages for qualitative variables were calculated. The

association of depression with age, gender, marital status, having income and level of education were calculated by using Chi-square test. The P value less than 0.05 was considered as statistically significant.

## Results

Table 1 revealed the distribution of the studied medical students who shared in the study. A total of 401 medical students participated in the study with a response rate of 85%. Among the respondents the majority 186 (46.4%) were in the age range of 18-21 years, 134 (33.4%) were males and 267 (66.6%) were females. Most of the students (96%) in the sample were single and 314 (78.3%) had no additional source of income. Students from all the years participated in this study, however, the majority were from second year (30.9%) and the sixth year (29.9%).

Figure 1 shows the distribution of depression severity among undergraduate medical students at Ibn Sini National College, Jeddah, Saudi Arabia. The study revealed that a minority (6.98%) were normal (0-4) whereas the distribution of mild depression (4-9) was 17.71%. However, depression was detected in 75.31% of the studied population, considering 10 score as a cut off point for depression. Among those depressed groups 23.44% were scored as having moderate depression (10-

14) while those who had moderately severe (15-19) and severe depression (20 or more) were 28.93% and 22.94% respectively.

Table 2 reveals that moderate to severe depression was more common in the youngest group. The majority (84.98%, 158/186) of those aged 18 – 21 were depressed followed by 21 – 24 years (67.74%, 65/155) and those of age 25 years or more (65%, 39/60). The association between the severity of depression and age was statistically significant ( $P = .002$ ).

The present study showed that depression was more prevalent among female medical students (79.4%, 212/276) compared to male medical students (67.16%, 90/134). The association between the severity of depression and gender was statistically significant ( $P = .033$ ).

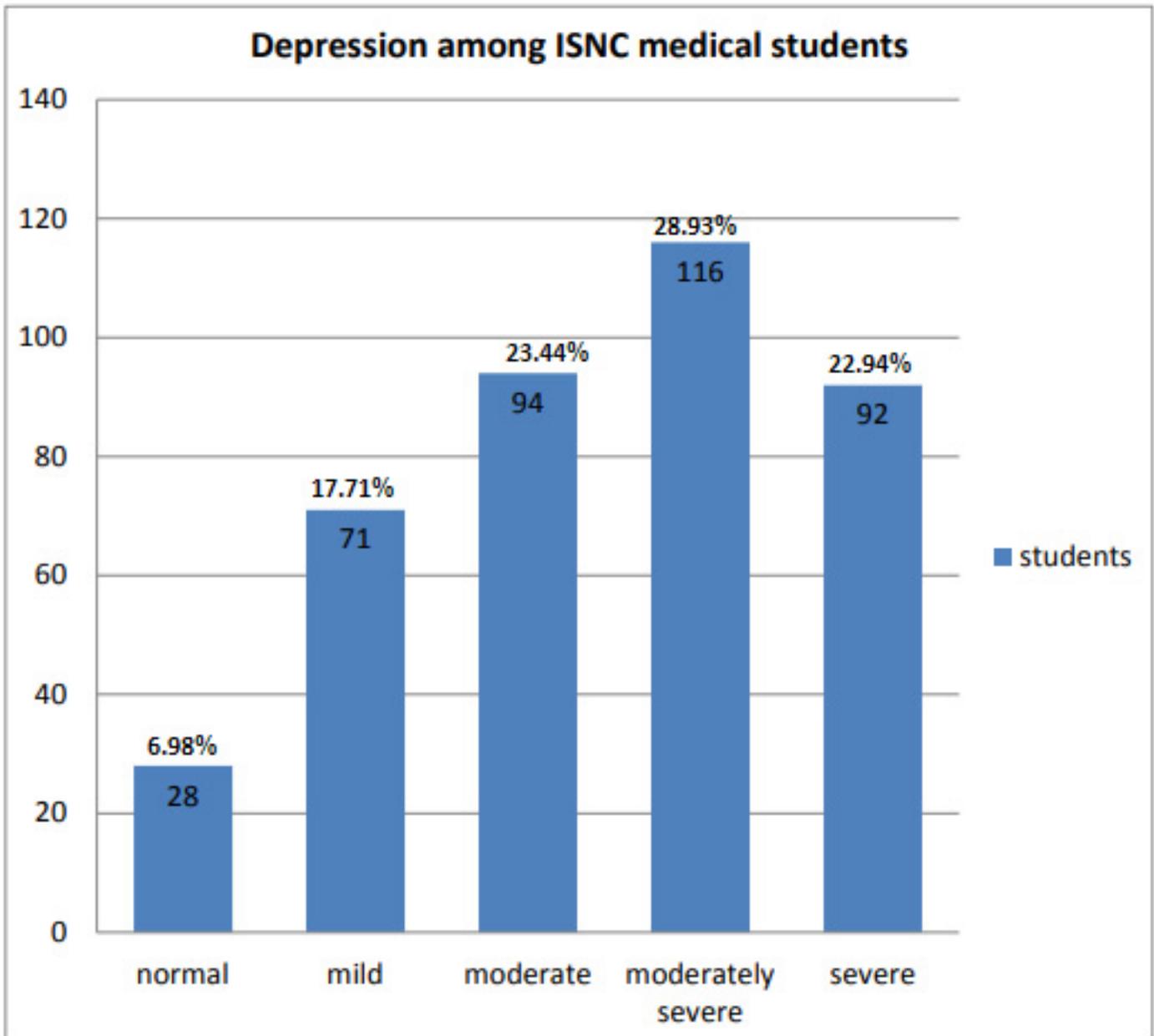
Depression symptoms were found to be not associated with marital status and presence or absence of a source of income.

The prevalence of depression was more in the second year medical students (85.48%, 106/124) followed by the sixth year (65.55%, 78/119) and the difference found between the severity of depression and year of studying was statistically significant ( $P = .010$ ).

**Table 1: Sociodemographic characteristics of undergraduate medical students at Ibn Sini National College, Jeddah, Saudi Arabia**

| Value                     | Number | Percentage % |
|---------------------------|--------|--------------|
| <b>Age</b>                |        |              |
| 18-21 years old           | 186    | 46.4%        |
| 22-24 years old           | 155    | 38.7%        |
| 25 and above              | 60     | 15%          |
| <b>Sex</b>                |        |              |
| Male                      | 134    | 33.4%        |
| Female                    | 267    | 66.6%        |
| <b>Marital status</b>     |        |              |
| Married                   | 16     | 4%           |
| Non-married               | 385    | 96%          |
| <b>Source of income</b>   |        |              |
| Yes                       | 87     | 21.7%        |
| No                        | 314    | 78.3%        |
| <b>Level of education</b> |        |              |
| First year                | 55     | 13.7%        |
| Second year               | 124    | 30.9%        |
| Third year                | 33     | 8%           |
| Fourth year               | 25     | 6.3%         |
| Fifth year                | 45     | 11.2%        |
| Sixth year                | 119    | 29.9%        |

Figure 1: Distribution of depression severity among undergraduate medical students at Ibn Sini National College, Jeddah, Saudi Arabia



**Table 2: Severity of depression according to sociodemographic factors and level of education among undergraduate medical students at Ibn Sini National College, Jeddah, Saudi Arabia**

|                         | Normal<br>(0 – 4) | Mild<br>(5 – 9) | Moderate<br>(10 – 14) | Moderately<br>severe<br>(15 - 19) | Severe<br>(20 – 27) | Total         | <i>P</i> -<br><i>value</i> <sup>a</sup> |
|-------------------------|-------------------|-----------------|-----------------------|-----------------------------------|---------------------|---------------|---|
| <b>Age</b>              |                   |                 |                       |                                   |                     |               |   |
| 18 - 21                 | 8<br>(4.30%)      | 20<br>(10.75%)  | 47<br>(25.27%)        | 56<br>(30.11%)                    | 55<br>(29.57%)      | 186<br>(100%) | .002*                                   |
| 22 – 25                 | 14<br>(9.03%)     | 36<br>(23.23%)  | 35<br>(22.58%)        | 48<br>(30.97%)                    | 22<br>(14.19%)      | 155<br>(100%) |   |
| 25 and above            | 6<br>(10.00%)     | 15<br>(25.00%)  | 12<br>(20.00%)        | 12<br>(20.00%)                    | 15<br>(25.00%)      | 60<br>(100%)  |   |
| <b>Gender</b>           |                   |                 |                       |                                   |                     |               |   |
| Male                    | 16<br>(11.94%)    | 28<br>(20.9%)   | 27<br>(20.15%)        | 33<br>(24.63%)                    | 30<br>(22.38%)      | 134<br>(100%) | .033*                                   |
| Female                  | 12<br>(4.49%)     | 43<br>(16.1%)   | 67<br>(25.09%)        | 83<br>(31.09%)                    | 62<br>(23.22%)      | 276<br>(100%) |   |
| <b>Marital state</b>    |                   |                 |                       |                                   |                     |               |   |
| Single                  | 25<br>(6.78%)     | 68<br>(17.66%)  | 88<br>(22.85%)        | 110<br>(28.87%)                   | 90<br>(23.84%)      | 385<br>(100%) | .511                                    |
| Married                 | 2<br>(12.5%)      | 3<br>(18.75%)   | 4<br>(25.00%)         | 5<br>(31.25%)                     | 2<br>(12.5%)        | 16<br>(100%)  |   |
| <b>Source of income</b> |                   |                 |                       |                                   |                     |               |   |
| Have source of income   | 6<br>(6.90%)      | 20<br>(22.99%)  | 18<br>(20.69%)        | 27<br>(31.03%)                    | 16<br>(18.39%)      | 87<br>(100%)  | .813                                    |
| No source of income     | 22<br>(7.01%)     | 51<br>(16.25%)  | 76<br>(24.20%)        | 89<br>(28.34%)                    | 76<br>(24.20%)      | 314<br>(100%) |   |
| <b>Education level</b>  |                   |                 |                       |                                   |                     |               |   |
| First year              | 4<br>(7.27%)      | 9<br>(16.36%)   | 15<br>(27.27%)        | 17<br>(30.91%)                    | 10<br>(18.19%)      | 55<br>(100%)  | .010*                                   |
| Second year             | 7<br>(5.65%)      | 11<br>(8.87%)   | 26<br>(20.96%)        | 36<br>(29.03%)                    | 44<br>(35.48%)      | 124<br>(100%) |   |
| Third year              | 1<br>(3.04%)      | 7<br>(21.21%)   | 8<br>(24.24%)         | 9<br>(27.27%)                     | 8<br>(24.24%)       | 33<br>(100%)  |   |
| Fourth year             | 0<br>(00%)        | 2<br>(8.00%)    | 10<br>(40.00%)        | 6<br>(24.00%)                     | 7<br>(28.00%)       | 25<br>(100%)  |   |
| Fifth year              | 4<br>(8.89%)      | 13<br>(28.89%)  | 7<br>(15.56%)         | 15<br>(33.33%)                    | 6<br>(13.33%)       | 45<br>(100%)  |   |
| Sixth year              | 12<br>(10.00%)    | 29<br>(24.17%)  | 28<br>(23.33%)        | 33<br>(27.50%)                    | 17<br>(15.00%)      | 119<br>(100%) |   |

## Discussion

Prevalence of depression among medical students is a matter of great concern as it may impair behavior of students, affect academic performance, lead to diminished learning and therefore affect patient healthcare upon employment of these students.

In this study, the prevalence of depression among medical students and their possible association with various variables were assessed using patient health questionnaire (PHQ-9) which measure the severity of depression level using the cutoff values of 10 to 14 dysthymia (minor depression) and 15 or above were considered to define major depression. The results from the current survey revealed that a remarkable proportion of medical students (75.31%) had depression (taking all levels of depression together). Three out of four students were found to have depression. A recent study of the prevalence of overall depression rate was found to be higher than the present study for the medical students of Karachi which was 92% (19), whereas it was previously recorded at 70% in a study of the same country several years ago (20). Regarding the prevalence, the current finding was similar to other studies carried out at Taif University, Saudi Arabia using the patient health questionnaire (PHQ-9) scoring. The overall percentage of depression in that study was seen in 75.7% of the students (21). However, the current study result is higher than the studies conducted in Madinah (Saudi Arabia) which was 28.3% (22), in Egypt which was 63.6% (23), in Tabriz (Iran) which was 62.7% (24), in Malaysia which was 64.4% (25). The variation might be due to the difference in sample size and data collection tool which was PQ-2 with 60 participant in Madinah, Saudi Arabia (22), DASS-21 with 412 participant in Egypt (23) (12), BDI with 175 participant in Tabriz (Iran) (24), DASS-21 with 194 participants in Malaysia (25), and AKUADS in Karachi (Pakistan) (20).

The present study showed that students who were in the age interval of 18-21 years were significantly more likely to have depression as compared to other age groups. This result is similar to a study conducted in the International Islamic University of Malaysia (25).

The present study showed significant differences in depression scores between males and females. Similar to our results, some previous studies showed higher levels of depression among female

students. Some western studies (26,27) have also shown female gender to be significantly correlated with depression. However, findings of some studies (28) are contrary to our results and found no differences in depression among male and female students.

Regarding educational level, those who are in the second and sixth year were more likely to have depression compared to those in the other educational levels. The current findings are similar partially with the Indian study (29) which revealed that depression was more (66.3%)

among second year medical students. This observation of the current study may be because of difference in the number of respondents as the highest response was from second and sixth year. This might be due to other factors such lack of social interaction; unfamiliar types of exam schedule; lower grades than anticipated; lack of vacation or break (30) or language problem (31).

## Conclusion

Depression is highly prevalent among medical student populations. Implication of depression is of serious concern as it could result in loss of potential to handle various stressors at college, impairment of functioning in classroom performance and later in clinical practice. In the light of the high percentage of depression seen in this study, actions must be taken to figure out the causes and solutions to these problems. It is very important to address the issue through effective counseling and instituting appropriate measures. Future recommendation is to conduct a larger scale study across Saudi Arabia to highlight the prevalence and causes of depression among medical students.

### The strength and limitation of the study:

The Current study had several strengths: Firstly using adequate sample size from a well-defined catchment area and secondly using a standard and valid instrument. However the present study also had some limitations such as not measuring the effects of other morbid psychiatric disorders.

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