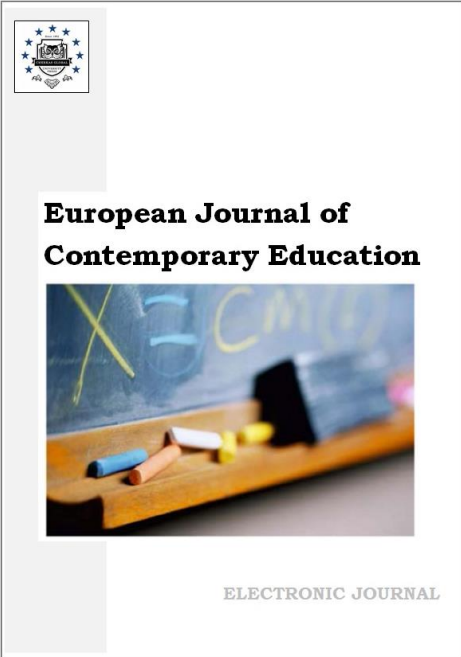




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Depressive Symptoms among Medical Students: A Cross-Sectional Study of Prevalence and Sociodemographic Determinants in Ghana

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Abstract

Depression is a global public health burden and affects all populations, especially students. Several studies worldwide have indicated depression among medical students as a significant concern, often leading to adverse effects on their quality of life, training and future practice. As part of academic and clinical training, medical students are usually exposed to daily academic and clinical demands significantly associated with depressive symptoms. In Ghana, where mental health is less prioritised and stigmatised, many citizens, including students, suffer without support. This study aimed at identifying the prevalence of depressive symptoms and associated demographic factors among medical students using a public university's medical school in Ghana. We selected two hundred thirty-two participants and screened them with the Beck Depression Inventory. The participants were across all the six year-levels of the medical school. The results showed that about 30 % of the students experience moderate to severe depressive symptoms. Also, female medical students experienced significantly higher depressive symptoms ($M = 18.69$) than male medical students ($M = 12.82$). Furthermore, students under 25 years of age experienced higher levels of depressive symptoms ($M = 16.49$) than those 25 years and above ($M = 9.52$). Besides, fee-paying medical students experienced higher depressive symptoms ($M = 16.28$) than regular students ($M = 11.69$). In conclusion, the prevalence of depressive symptoms screened among the medical students in our study was quite alarming. Thus, there is an urgent need to implement various mental health promotion interventions, policies, and stakeholder engagements

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to address depression among medical students in Ghana. Our findings have implications for research, medical training, and policy.

Keywords: depression, prevalence, sociodemographic factors, medical students, Ghana.

1. Introduction

In Ghana, students' mental health is least considered as the country has given very little attention to mental health in general over the years. Meanwhile, the World Health Organisation (WHO, 2008) indicated that depression is the leading cause of disability worldwide. Unfortunately for medical students in Ghana, they are perceived as most privileged or rather endowed, and many will not be expected to experience mental difficulties. Meanwhile, evidence abounds that the nature of the programme in medical school, the demands and student life, in general, have substantial implications for mental health (Basnet et al., 2012; Jadoon et al., 2010).

Depression is a typical result of the pressures students face in medical school (Shaikh et al., 2004), as the condition has been prevalent among students in general (Kugbey et al., 2015; Peltzer et al., 2013). This situation has been observed in many countries across the globe. In Egypt, for example, according to Ibrahim and Abdelreheem (2015), the prevalence rate of depression among medical students compared to their colleagues studying Pharmacy at the University of Alexandria was 57.9 % and 51.1 %, respectively. Depression among medical students has been linked to several factors, including gender and years of study. For example, Ihab Wafaa Hafez et al. (2020) noted among medical students in Egypt that moderate to severe depression is predicted by the female gender, presence of mental illness, not having someone to talk to when under stress, stressful life events, socioeconomic level, poor learning environment, and poor grades. Female medical students have been found to experience higher levels of depression than males (Jadoon et al., 2010; Shabbir, Bashir, 2016), and this has been consistent across the literature.

Another study by Inam (2007) comparing the prevalence of depression among male and female medical students in the pre-clinical years in medical colleges in Saudi Arabia showed that the prevalence of anxiety and depression in female students is 60.6 % and in males is 44.4 %. His study also showed that pre-clinical year 1 records higher depression, followed by year 3 before year 2. However, Ghana remains one country with little information on the prevalence of depression and other mental health challenges among medical students. There is a need for scientific investigations in Ghana to explain why students in medical school may need mental health attention throughout their study period. In the current study, the extent to which students in a medical school in Ghana suffer depression are examined, and recommendation is made. In Ghana, medical students are held in high esteem, neglecting the peculiar challenges they may face. Thus, the study answers two main questions: 1. What is the prevalence of depressive symptoms among medical students at the University of Health and Allied Sciences? and 2. What demographic factors are associated with depression among medical students?

2. Method

Study Design

We used a cross-sectional survey design to reach out to a good section of medical students on the subject matter. With this, we selected students from all levels in the school of medicine for the study.

Population and sample

The study population was the students of the School of Medical at the University of Health and Allied Sciences, Ho, Ghana. This population comprised medical students (MBChB) from levels 100 to 600. The University of Health and Allied Sciences has the youngest medical school in Ghana, with its first batch of medical students to graduate in the year of this study. Therefore, the entire population of the university's medical school was the population for the survey (Sarfo et al., 2022). Thus, we selected 232 participants (146 males and 86 females) for the study. Also, our participants comprised 119 and 113 from the pre-clinical and clinical years, respectively.

Data collection tools

The twenty-one-item Beck Depression Inventory (BDI) (Beck et al., 1996) was used to measure the depressive symptoms of the students. Responses were rated on a scale of zero (0) to three (3), with higher ratings indicating higher severity of depression. Items one to thirteen measure psychological symptoms, while items fourteen to twenty-one measure more physical

symptoms. Responses were added up to get a total score. Scores were categorised into normal (1–13), mild mood disturbance (14–19), mild depression (20–28), moderate depression (29–63), and severe depression.

Data collection procedure

Ethical approval was obtained from the University of Health and Allied Sciences Research Ethics Committee to gather data for the study. Permission was obtained from the School of Medicine to conduct the survey among the students. Various course/level representatives were contacted and arranged to meet students before their lectures began. The purpose of the study was discussed with each class visited, and the research consent forms were distributed alongside the questionnaire. Students who completed the consent form and the questionnaire were selected for the study. Moreover, students who were not available when the class was engaged in the study were not considered for the study.

Data Analysis

The data collected was organised in Excel spreadsheets and imported into the Statistical Package for the Social Sciences (SPSS), version 20.0, for analysis. Data were analysed using independent t-tests, ANOVAs and descriptive statistics.

3. Results

The study’s results are presented in line with its aims. These include the levels of depression and the factors associated with depression among medical students. Table 1 shows the demographic information of participants in the study, where more males (146) than females (86) were obtained for the study, with 182 falling under the age of 25. Most participants are also full-fee-paying students (72 %) since the school generally has more fee-paying medical students than regular-fee students. Most participants are also funded by their parents (75.9 %), with a few (2.2 %) funding their medical school education.

Table 1. Demographic characteristics and levels of depressive symptoms

| Demographics | Categories | Frequency (n) | Percent (%) |
|------------------------------|-------------|---------------|-------------|
| Sex | Female | 86 | 37.1 |
| | Male | 146 | 62.9 |
| Age | <25 years | 182 | 78.4 |
| | ≥ 25 years | 50 | 21.6 |
| Admission type | Regular | 65 | 28.0 |
| | Fee-paying | 167 | 72.0 |
| Year of study | Year 1 | 29 | 12.5 |
| | Year 2 | 48 | 20.7 |
| | Year 3 | 42 | 18.1 |
| | Year 4 | 42 | 18.1 |
| | Year 5 | 36 | 15.5 |
| | Year 6 | 35 | 15.1 |
| Funding source | Self | 5 | 2.2 |
| | Guardian | 18 | 7.8 |
| | Scholarship | 33 | 14.2 |
| | Parent | 176 | 75.9 |
| Level of depressive symptoms | Normal | 71 | 30.6 |
| | Mild | 91 | 39.2 |
| | Moderate | 47 | 20.3 |
| | Severe | 23 | 9.9 |

In [Table 1](#), the frequencies/percentages of students at various levels of screened depressive symptoms are presented. It is observed that 30 % and 39.2 % experience normal and mild depressive symptoms. On the other hand, 20.3 % and 9.9 % experience moderate and severe depressive symptoms. These figures suggested that many medical students experienced depressive symptoms since about 30 % showed moderate to severe levels of the condition. A cross-tabulation of the depressive symptoms and demographic factors such as gender, age, level of study, and admission type is presented in [Table 2](#). The results in [Table 2](#) indicated that for moderate to severe depressive symptoms screened, the prevalence rate for students in pre-clinical years was 22.5 % against 7.8 % for clinical years. Fee-paying students reported 25 % moderate to severe depressive symptoms against 5.1 % for regular students. Besides, gender and age disparities in prevalence also showed 16 % females compared to 14.2 % males, and those below 25 years have 27.6 % and 2.6 % for those aged 25 years and above reporting moderate to severe symptoms. These differences in scores were further subjected to independent t-testing (see [Table 3](#) for details).

Table 2. Cross-tabulation of levels of depressive symptoms and demographic factors

| Demographics | Categories | Levels of depression | | | |
|----------------|--------------|----------------------|-------------|-------------|------------|
| | | Normal | Mild | Moderate | Severe |
| Year of study | Pre-clinical | 22 (9.5 %) | 45 (19.4 %) | 34 (14.7 %) | 18 (7.8 %) |
| | Clinical | 49 (21.1 %) | 46 (19.8 %) | 13 (5.6 %) | 5 (2.2 %) |
| Admission type | Fee-paying | 40 (17.2 %) | 69 (29.7 %) | 39 (16.8 %) | 19 (8.2 %) |
| | Regular | 31 (13.4 %) | 22 (9.5 %) | 8 (3.4 %) | 4 (1.7 %) |
| Gender | Male | 54 (23.3 %) | 59 (25.4 %) | 25 (10.8 %) | 8 (3.4 %) |
| | Female | 17 (7.3 %) | 32 (13.8 %) | 22 (9.5 %) | 15 (6.5 %) |
| Age | <25 years | 42 (18.1 %) | 76 (32.8 %) | 43 (18.5 %) | 21 (9.1 %) |
| | ≥ 25 years | 29 (12.5 %) | 15 (6.5 %) | 4 (1.7 %) | 2 (.9 %) |

The results in [Table 3](#) showed that female medical students experienced a significantly higher level of depressive symptoms ($M = 18.69$) compared to their male colleagues ($M = 12.82$), [$t(230) = 4.28$, $p = .001$]. Furthermore, students under 25 years of age reported higher depressive symptoms ($M = 16.49$) than those 25 years and above ($M = 9.52$), [$t(230) = 4.33$, $p = .001$], while fee-paying medical students had higher levels of symptoms ($M = 16.28$) than regular students ($M = 11.69$), [$t(230) = 3.05$, $p = .001$]. It is further shown in the results that pre-clinical year medical students experienced higher levels of depressive symptoms ($M = 18.24$) than those in their clinical years ($M = 11.58$), [$t(230) = 5.102$, $p = .001$]. In effect, females, students under 25 years, fee-paying medical students and pre-clinical year students in our study experienced higher levels of depression than their counterparts.

Table 3. Independent t-test showing differences between demographic variables on depressive symptoms

| Demographics | Categories | N | Mean | SD | t | p |
|----------------|--------------|-----|-------|--------|-------|------|
| Gender | Male | 146 | 12.82 | 9.262 | 4.280 | .000 |
| | Female | 86 | 18.69 | 11.368 | | |
| Age | <25 years | 182 | 16.49 | 10.472 | 4.332 | .000 |
| | ≥ 25 years | 50 | 9.52 | 8.488 | | |
| Admission type | Fee-paying | 167 | 16.28 | 10.606 | 3.050 | .003 |
| | Regular | 65 | 11.69 | 9.382 | | |
| Study level | Pre-clinical | 119 | 18.24 | 10.690 | 5.102 | .000 |
| | Clinical | 113 | 11.58 | 9.079 | | |

Note. Degree of freedom = 230, Bonferroni adjustment = .012

Following our findings in [Table 3](#), it was essential to identify the specific year of medical school study associated with a higher level of depression. Also, funding poses a challenge to many students in Ghana. Thus, it is vital to examine how these factors influence depressive symptoms among medical students. Therefore, a two-way ANOVA was conducted to compare the six different medical school years and the various funding sources on the severity of depression. The result is presented in tables ([Table 4](#) – mean and standard deviation scores of the funding sources and years of study and [Table 5](#) – the ANOVA results).

Table 4. Descriptive statistics showing the means scores of sources of funding and year of study on depressive symptoms

| Source of funding | Year of Study | N | Mean | Std. Deviation |
|-------------------|---------------|-----|-------|----------------|
| Parent | Year 1 | 21 | 24.29 | 15.222 |
| | Year 2 | 39 | 16.67 | 8.161 |
| | Year 3 | 30 | 18.03 | 10.427 |
| | Year 4 | 35 | 15.11 | 8.917 |
| | Year 5 | 24 | 11.12 | 9.190 |
| | Year 6 | 27 | 9.00 | 8.762 |
| | Total | 176 | 15.57 | 10.805 |
| Guardian | Year 1 | 2 | 27.00 | 14.142 |
| | Year 2 | 3 | 7.00 | 3.464 |
| | Year 3 | 1 | 33.00 | - |
| | Year 4 | 2 | 2.50 | 2.121 |
| | Year 5 | 5 | 11.00 | 12.884 |
| | Year 6 | 5 | 10.60 | 6.841 |
| | Total | 18 | 12.28 | 11.478 |
| Self | Year 3 | 1 | 4.00 | - |
| | Year 4 | 2 | 5.50 | .707 |
| | Year 5 | 2 | 8.50 | 10.607 |
| | Total | 5 | 6.40 | 5.683 |
| Scholarship | Year 1 | 6 | 17.33 | 8.595 |
| | Year 2 | 6 | 12.67 | 6.501 |
| | Year 3 | 10 | 17.70 | 6.237 |
| | Year 4 | 3 | 10.67 | 15.144 |
| | Year 5 | 5 | 14.20 | 6.419 |
| | Year 6 | 3 | 8.33 | 4.619 |
| | Total | 33 | 14.70 | 7.756 |
| Total | Year 1 | 29 | 23.03 | 13.968 |
| | Year 2 | 48 | 15.56 | 8.100 |
| | Year 3 | 42 | 17.98 | 9.784 |
| | Year 4 | 42 | 13.74 | 9.435 |
| | Year 5 | 36 | 11.39 | 9.169 |
| | Year 6 | 35 | 9.17 | 8.115 |
| | Total | 232 | 14.99 | 10.463 |

Findings in [Table 5](#) indicated that the funding source has no significant effect on depressive symptoms among medical students [$F(3, 232)=1.73, p=.16$]. However, the study year significantly affected participants' depressive symptoms [$F(5, 232)=1.73, p=.00$]. Multiple comparisons are conducted, and the result is presented in [Table 6](#).

A comparison of the years of the study presented below showed that year 1 differed significantly from year 2, year 4, year 5 and year 6. The result also revealed that year 3 differed considerably from years 5 and 6. This finding indicated that medical students in year 1 experienced higher levels of depressive symptoms compared to years 2, 4, 5, and 6. Also, those in year 3 experienced higher symptoms than participants in years 5 and 6 since year 1 recorded the highest mean, followed by year 3 (see [Table 4](#)).

Table 5. Two-Way ANOVA showing the effects of source of funding and year of study on depressive symptoms

| Source | Sum of Squares | df | Mean Square | F | p |
|-----------------------------------|----------------|-----|-------------|--------|------|
| Intercept | 8861.923 | 1 | 8861.923 | 94.678 | .000 |
| Funding source | 486.083 | 3 | 162.028 | 1.731 | .162 |
| Year of Study | 1844.086 | 5 | 368.817 | 3.940 | .002 |
| Funding source * Year of Study | 1110.762 | 12 | 92.563 | .989 | .461 |
| Error | 19749.687 | 211 | 93.600 | | |
| Total | 77428.000 | 232 | | | |

Table 6. Bonferroni Multiple Comparisons

| (I) Year of Study | (J) Year of Study | Mean Difference (I-J) | p |
|-------------------|-------------------|-----------------------|-------|
| Year 1 | Year 2 | 7.472* | .019 |
| | Year 3 | 5.058 | .480 |
| | Year 4 | 9.296* | .001 |
| | Year 5 | 11.646* | .000 |
| | Year 6 | 13.863* | .000 |
| Year 2 | Year 3 | -2.414 | 1.000 |
| | Year 4 | 1.824 | 1.000 |
| | Year 5 | 4.174 | .787 |
| | Year 6 | 6.391 | .051 |
| Year 3 | Year 4 | 4.238 | .700 |
| | Year 5 | 6.587* | .047 |
| | Year 6 | 8.805* | .001 |
| Year 4 | Year 5 | 2.349 | 1.000 |
| | Year 6 | 4.567 | .615 |
| Year 5 | Year 6 | 2.217 | 1.000 |

4. Discussion

The current study aimed to establish the levels and factors associated with depression among medical students. The results showed that females, medical students under 25, fee-paying students, and pre-clinical years especially years 1 and 3, experienced higher depression levels. These findings are essential as little is known about the mental health of medical students in Ghana. The prevalence of depression established in the study shows that about 30 % of the students experience moderate to severe depression. This significant proportion requires attention as these can affect their training and general well-being.

Over the years, it has been evident in the literature that depression is prevalent among medical students (Anderson et al., 2022; Basnet et al., 2012; Pham et al., 2019; Tam et al., 2019). The journey to entering medical school in itself is stressful and depressing for many (Shabbir, Bashir, 2016). Unfortunately, little is known about this situation in Ghana. However, a study among medical students at the University of Cape Coast in Ghana revealed that students experienced stress from their academic work (Forde et al., 2015). Indeed, academic demands in medical schools globally are challenging, posing a serious threat to their mental health. According to Kugbey et al. (2015), students in Ghana generally experience mental health challenges such as depression and anxiety. Therefore, this situation requires attention, especially for medical students who complete and attend to the country’s health needs.

Apart from academic workload, several other factors related to individual students account for the level of depression among medical students. Gender is one such factor observed in this study. It was observed that the female gender is more susceptible to depression than the males. Gender differences in depression are common knowledge in mental health due to several differences between males and females (Goodwin, Gotlib, 2004; Hou et al., 2020; Sagud et al., 2002). It must interest

university counsellors to pay extra attention to females in universities, especially medical schools to assist such students with their academic challenges (Alharbi et al., 2018).

Age is a significant factor observed in this study to impact depression among medical students. Medical students below age 25 were found to experience a higher level of depression than those aged 25 and above. This finding on the impact of age on depression contradicts Jadoon et al. (2010) and Shabbir and Bashir (2016), who found no association between age and depression among medical students. However, the age of medical students can be related to their years of study. The current study's year of study significantly affects depression among medical students.

It was observed that those in their pre-clinical years experienced higher levels of depression than those in their clinical years. A further analysis comparing the individual years of the study indicates that those in year 1 recorded the highest level of depression, followed by years 3 and 2. This finding is similar to Inam's (2007) and Alharbi et al.'s (2018) studies. Typically, the pre-clinical years of medical school require students to successfully pass several courses, especially in the basic sciences, which can be challenging and stressful. Evidently, the fear of failure, increased workload, and adjustment challenges, especially for those in the early years, are expected more than those in the clinical years.

The type of admission of medical students is another significant factor observed in this study to influence depression among medical students. Medical schools in Ghana admit students on two statuses: full fee-paying and regular students. For the average Ghanaian, full-fee paying is an expensive option for a child's education. Currently, that option is becoming the norm in all medical schools in Ghana. As such, students may experience delays in paying their fees from their parents or any funding source. This challenge in funding medical education in Ghana needs to be examined, as it could add to students' stress and exacerbate their levels of depression.

5. Conclusion

Our study noted an alarming risk for depression among our participants. Clearly, in this study, it can be concluded that depression is a relatively common challenge among medical students. Individual sociodemographic factors and the general nature of the medical training programme and funding were crucial determinants of depressive symptoms among participants. We also noted that the pre-clinical years in medical school are critical. Currently, the fee-paying policy introduced into medical education in Ghana should be expected to complicate the mental health of students and their parents. Ghana's mental health predicament is yet to be fully recognised at the policy level, although some remarkable transformations have been achieved so far. Depression has globally been reeking havoc for years. Though the situation may not differ in Ghana, data on current affairs is scarce. This situation is a wake-up call for school counsellors and university managers to institute measures that will cater to the mental health needs of students in Ghana. Parents must also intensify support for their wards regardless of their academic achievements. Future qualitative research should look at the lived experiences of medical students regarding funding their education and its implication on their mental health in Ghana. Policies on medical training in Ghana must consider the mental health needs of students and should ensure access to assessment and management services.

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7. Conflict of interest

The authors report no conflict of interest.

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