



## Prevalence and Comorbidity of Generalized Anxiety and Depression among Medical Students at Selected Universities in Lusaka, Zambia

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**ABSTRACT:** Research shows that medical students suffer from anxiety and depression, which are the 2 biggest mental health disorders, and their health only deteriorates upon entering the medical field. Although studies have been conducted to investigate their existence, very few to none have explored their prevalence and association amongst medical students in Zambia. This study will therefore investigate on the prevalence and comorbidity of both anxiety and depression amongst medical students in Zambia. A cross-sectional study was conducted on 376 medical students from 2 medical universities which were selected using a combination of convenience and voluntary sampling techniques. The Patient health questionnaire was used to assess depression whilst the Generalised Anxiety Disorder Scale was used to assess anxiety amongst medical students. The data was analyzed using both Descriptive statistics, specifically measures of central tendencies and cross-tabulation were used to explain the study participant in relation to study variables. The study employed inferential statistics, specifically, the Pearson's Product Moment correlation coefficient ( $r$ ) was used to measure the correlation between anxiety and depression. The study revealed that the prevalence of depression amongst the participants was 68% and the comorbidity of anxiety and depression was found to be 60.4% ( $p < 0.001$ ). The study revealed high prevalence and comorbidity of anxiety and depression. Universities should collaborate with non-governmental organizations to treat, educate and improve on the management of anxiety and depression among medical students.

**KEYWORDS:** Anxiety, Depression, Generalized Anxiety Disorder, Stress, University students.

### INTRODUCTION

Due to the high intellectual demands of the course and the several units that must be completed each semester, students in medicine frequently spend more than 40 hours per week in class. The already taxing 40 hours are then increased by studying, completing courses, and preparing for practical. Students who study medicine are expected to work freely and contribute to their own professional growth because it is a professional field of study. As a result of the numerous courses that must be taken each semester and the pressure from families to perform well, students frequently have multiple exams each week. This can be especially difficult for medical students. Furthermore, most Universities finance offices place financial pressure on students, stating that failure to pay fees will prevent one from taking their semester examinations, which could ultimately jeopardize one's ability to pursue a career in medicine.

It is undeniable that dealing with the difficulties described in the introduction paragraph on a regular basis will undoubtedly predispose medical students to developing depression symptoms, as well as maybe anxiety symptoms as well. Yet every medical student in medical school must deal with that reality on a daily basis. Medical students' physical and emotional health may suffer as a result of their hectic schedules, which are packed with extracurricular activities as well as financial concerns.

Depression and anxiety (APA, 2022), if left untreated and unaddressed, can result in or trigger undesirable life events, such as alcohol and drug abuse and, in the worst cases, suicide. Despite the fact that everyone experiences anxiety and depression, relatively few people will publicly acknowledge their existence. The two are among the most agonizing built-on enigmas known to man, and as they are thought to be a sign of weakness, everyone tries to avoid them and denies their existence. Several studies (Smith M, 2016) done across the globe have indicated that most medical students suffer from both anxiety and depression than others of the same age group. About 1 in every 4 medical student suffers from anxiety or depression whilst 11% had suicidal intention.

The goal of medical education is to generate future physicians who have the necessary skills and knowledge to treat patients, advance medical knowledge, and advance public health. However, psychological distress is common in medical education, especially



depression, which is a problem that is getting worse everywhere. The prevalence varies from nation to nation and from institution to institution, and this has been a cause for concern for almost 50 years. Without a doubt, depression is a major contributor to psychological illness globally, and it is now the most commonly reported obstacle to academic performance among medical students at many institutions of higher learning, including medical universities in Zambia (Bayram & Bilgel, 2008, p667).

Meta-analyses data indicated that over 33% of medical students were depressed whilst 28% suffered from anxiety (Mao et al, 2019). These high levels therefore indicate that there is a problem that needs to be resolved. WHO (2003) has shown that the prevalence of this condition is very high and has identified it as the 4th leading cause of disease worldwide. The effects of depression on practicing physicians are long-lasting, and if they are not treated, this could lead to medical errors and compromise patient care. Sadly, despite the seriousness of the issue and the fact that depression is the most easily treatable mental disorder condition, the general public and medical students tend to stigmatize the condition, and those who are affected frequently believe that seeking professional help will make them appear weak or lazy (WHO, 2003). Over the years, the cases of deliberate self-harm have increased at the University of Zambia among medical students mostly as a result of depressive episodes and some cases of attempted suicide have been reported at the University B. The University A, reported 2 cases of suicide among medical students in the year 2022 and had there been some form of intervention this could have been avoided. Due to these reasons, the purpose of this study will therefore aim to investigate on the number of students affected or suffer from depression and/or anxiety so as to put in place effective treatment methods and avoid such cases in the future or at least reduce their prevalence.

The main objective of the study was to determine the prevalence and comorbidity of depression and anxiety among medical students in selected universities in Lusaka, Zambia. The specific objectives of the study were as follows:

- What is the prevalence and level of anxiety and depression amongst medical students in selected universities in Lusaka?
- What are the specific ways to deal with anxiety and depression among the medical students in selected universities in Lusaka?
- How often do anxiety and depression symptomology present comorbidly?

By performing this study, it will help expose the real picture as to whether medical students in selected universities in Zambia have contributed to the population of people who are deemed as clinically depressed. Also, it will help explore what percentage of those students also have anxiety or either. Therefore, it is hoped that this study will help provide more proof on that which we already know to be true that both conditions most commonly occur simultaneously.

With this already existing body of knowledge, it is hoped that interventions will be performed to help curb the prevalence of these conditions and also, stigmatization will be a thing of the past as most people fail to get help due to fear of being embarrassed or otherwise. Zambia, like other low-income countries pay very little attention to mental health as it is deemed unnecessary due to ignorance and lack of adequate resources. Most people who suffer from mental health conditions are rendered “mad” by the lay society. Some even believe these people with mental health issues were bewitched as they are not “normal” according to societal and cultural beliefs. Hence, this study was aimed to raise awareness that mental health is a real challenge and those that tend to stray from societal norms really just require some form of clinical help to get better.

## MATERIALS AND METHODS

### *Theoretical Framework*

The Academic Stress Theory posits that the demanding nature of medical education, characterized by high workloads, intense competition, and rigorous academic expectations, significantly contributes to psychological distress among students. The chronic exposure to academic stressors may overwhelm coping mechanisms, leading to increased anxiety and depressive symptoms. Additionally, the pressure to perform well academically and fears of failure can further exacerbate stress and negatively impact mental health.

The theoretical framework outlined above integrates multiple perspectives to provide a comprehensive understanding of the factors contributing to generalized anxiety and depression and their comorbidity among medical students. By considering individual vulnerabilities, cognitive processes, social support, academic stress, and the promotion of self-care and resilience, this framework informs the development of effective prevention and intervention strategies within medical education. By addressing these factors, medical schools can create a supportive environment that promotes mental well-being and fosters the success and professional development of their students.

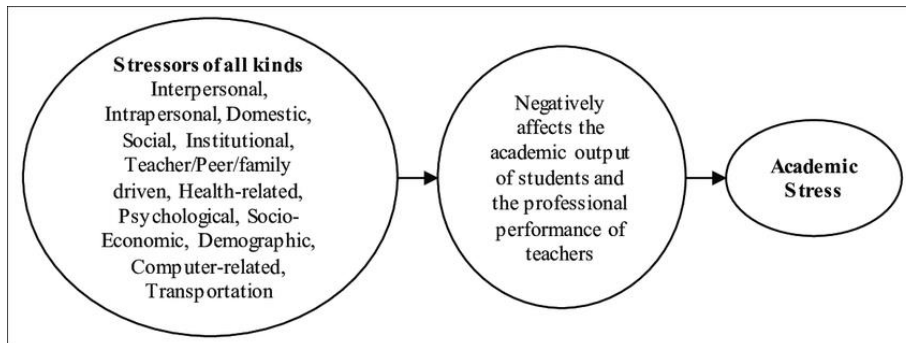


Figure 4: Academic Stress Theory

Conceptual Framework

The conceptual framework used in this study aims to provide a holistic understanding of the factors influencing the prevalence and comorbidity of generalized anxiety and depression among medical students. This framework incorporates key concepts and relationships derived from existing literature and theories, guiding the exploration of various dimensions that contribute to mental health outcomes in this population.

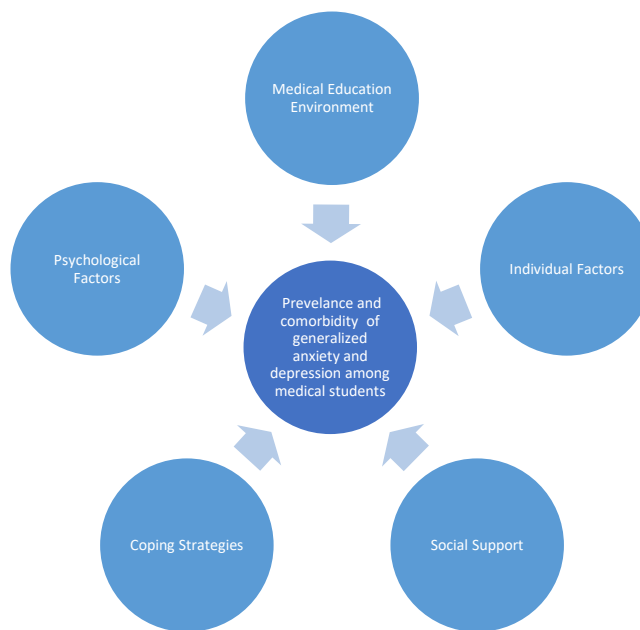


Figure 1.1 Diagrammatic representation of the Conceptual Framework

The contextual explanation of the individual constructs of the Conceptual Framework are as follows;

**Medical Education Environment:** The medical education environment encompasses the structural and organizational aspects of medical training, including curriculum design, workload, and academic expectations. This component acknowledges the unique stressors and challenges faced by medical students, such as long hours, high academic demands, and intense competition. The medical education environment is considered a central factor that shapes the experiences and well-being of medical students, potentially impacting their susceptibility to anxiety and depression.

**Individual Factors:** Individual factors encompass the personal characteristics and experiences of medical students that may influence their mental health outcomes. This includes variables such as gender, age, prior mental health history, personality traits, and coping mechanisms. Individual factors also encompass self-perceptions, self-efficacy, and self-esteem, which can impact resilience and the



ability to navigate the stressors of medical education. The interplay between individual factors and the medical education environment is essential for understanding the differential vulnerability to anxiety and depression among medical students.

**Social Support:** Social support refers to the interpersonal relationships and networks that provide emotional, informational, and instrumental assistance. This component recognizes the importance of social connections, both within the medical education setting and outside, in buffering the negative impact of stress and fostering mental well-being. Supportive relationships with peers, faculty members, mentors, and family can serve as protective factors against anxiety and depression. Social support may include access to counseling services, peer support groups, or informal networks.

**Coping Strategies:** Coping strategies encompass the cognitive, emotional, and behavioral efforts employed by medical students to manage stress and adverse experiences. Effective coping strategies can mitigate the impact of stressors, promote resilience, and reduce the risk of anxiety and depression. Examples of coping strategies include problem-solving, seeking social support, engaging in leisure activities, mindfulness practices, and adopting a positive mindset. The choice and effectiveness of coping strategies may vary among individuals and influence mental health outcomes.

**Psychological Factors:** Psychological factors refer to the cognitive and emotional processes that shape mental health outcomes. This component includes cognitive appraisal, such as the interpretation of stressors and the perception of control, as well as emotional regulation skills. Psychological factors also encompass self-critical thinking patterns, maladaptive beliefs, and cognitive distortions that may contribute to the development and maintenance of anxiety and depression. The interaction between psychological factors, individual characteristics, and the medical education environment can influence the manifestation and severity of mental health issues.

The conceptual framework presented above provides a comprehensive view of the factors influencing generalized anxiety and depression among medical students. By considering the medical education environment, individual factors, social support, coping strategies, and psychological processes, this framework offers a foundation for understanding the complex interactions that impact mental health outcomes in this population. Further research and interventions based on this framework can promote a supportive and nurturing environment for medical students, fostering their mental well-being and academic success.

## Methods

This research was analyzed using the mixed research approach. The goal was to measure the “prevalence” which is a measurable unit hence it was ideal to employ that as the choice of study. The general consensus is that medical students are generally under a lot of stress and in turn end up becoming anxious or depressed hence the goal of this research was to assess whether the phenomena is true or will be disproved. In order to come up with a conclusive answer, a mixed research approach was ideal as it provided an in-depth analysis of the research. The study employed a parallel-convergent research design to collect and analyze both qualitative and quantitative data.

A combination of a convenience and voluntary sampling technique along with stratified random sampling was used in the study. The purposive study was employed to select the medical schools from only those that selectively offer the medicine program whilst stratified random sampling was incorporated to select the 376 students.

In view of the purpose of this study, the research depended solely on primary data as a source of data collection. Primary data for the purpose of this study was obtained through the use of questionnaires. In this case, the General Anxiety disorder (GAD-7) was used to measure generalized anxiety whilst the Patient Health Questionnaire (PHQ-9) was used to assess one’s level of depression (Spitzer, 2006)

The data was analyzed using both Descriptive statistics, specifically measures of central tendencies and cross-tabulation were used to explain the study participant in relation to study variables. The study employed inferential statistics, specifically, the Pearson’s Product Moment correlation coefficient ( $r$ ) was used to measure the correlation between anxiety and depression. The strength of the association, at ( $p < 0.001$ ) on bivariate analyses was considered as statistically significant.

## RESULTS

Of the total 376 participants who took part in the study, a total of 119 were male and 257 were female. 230 participants were from University A and 146 who took part represented University B. Majority of participants who took part in this study were in their first year of study. 173 first year students took part in the study, 93 in their second year, 59 in their third year and 17 in their fourth and



fifth year respectively. The General anxiety questionnaire above was used to score the presence and severity of anxiety among participants in this study. The scores of 0 – 4, for no anxiety, 5 – 9 for mild anxiety, 10 – 14 for moderate anxiety, and 15 – 21 for severe anxiety were used to categorise the participants' scores on the questionnaire. The following diagram reflects the anxiety levels among the participants based on their scores on the questionnaire. Study findings revealed a prevalence of anxiety of 70% among participants which represents a significantly high prevalence among students. This in turn proves the null hypothesis to be true which states that students from both these universities suffer from anxiety and rejects the alternative hypothesis which claims that there is no prevalence of anxiety amongst medical students at these institutions.

Regarding prevalence of anxiety, the study data presented absence of anxiety in 114 (30.3%) of the participants, mild anxiety in 125 (33.2%) of participants, moderate anxiety in 93 (24.7%) and severe anxiety in 44 (11.7%) of the participants. Study findings revealed a prevalence of depression of 68% among participants which represents a significantly high prevalence among students. This in turn proves the null hypothesis to be true which states that students from both these universities suffer from depression and rejects the alternative hypothesis which claims that there is no prevalence of depression amongst medical students at these institutions.

Using focus group discussions open ended questions the majority of students representing about 50% of all respondents, revealed talking to a counsellor and seeking professional help as a way of dealing with anxiety and depression.

Respondent 3 is quoted as saying "Maybe first by knowing the reason behind their anxiety and depression, exercising, been around people particularly friends, studying to know and learn, trying by all means to avoid feeling anxious, feeling loved too and knowing that they are beautiful, enough, have a nice body and good grades." Respondent 8 suggested that "the best way to deal with anxiety and depression is through Interventions that raise awareness on both these conditions, so people can be comfortable to talk about it and get help if need be"

Practicing meditation was also revealed to be one of the ways to deal with depression by 30% of focus interview respondents. Respondent 60 "I feel like having trust group sessions were all students can pour out their fears and their stress , because most are afraid to speak out their emotions . Counselling sessions would really help. Having medical professionals' speakers who have also gone through the same trouble, pain and suffering, talk to us and just encourage us on how to survive throughout the years" Respondent 188 revealed that, "I think counselling and therapy is necessary for good mental health. Many issues seem too big in our minds because we don't have anyone neutral and non-judgemental whom we can confide in. We all have times when we feel down and depressed, it would be nice to normalise talking about our feelings and being able to feel free to say that we are having a difficult time without being viewed as weak or incompetent" Exercising, reducing on school workload and having time for fun was also cited as one of the best ways to deal with anxiety and depression. The cross tabulation of anxiety and depression reveals significance between occurrence of the two conditions with majority of the participants depicting presence of both (60.4%) and a p – value of < 0.001. Based of off these results, the null hypothesis is true that, students suffer from both anxiety and depression simultaneously and thereby rejects the alternative hypothesis that states that the 2 are none co-existing.

## DISCUSSION

The study was successfully undertaken with the objectives and research questions answered. The majority of the participants were female with a 68.4% out of total respondents and 31.6% being males. Majority of students were aged between 18-22 representing 69.9% of all respondents. A total of 230 respondents were from University A and 146 from University B. 173 participants representing 46% of total respondents were in their first year of study, 93 in their second year, and 59 in their third year. This distribution can be attributed to the predominating age range at which students get into college and university and the generally young population found in most colleges and universities. Age is an important contributing factor when it comes to depression. It is common for depression to start showing up during adolescence. The (NIMH, 2015) reports that young adults from 18 to 25 years of age had the highest rates of depression at 13.1% of U.S. adults in 2017.

The goal of medical education is to generate future physicians who have the necessary skills and knowledge to treat patients, advance medical knowledge, and advance public health. However, psychological distress is common in medical education, especially depression, which is a problem that is getting worse everywhere. The prevalence varies from nation to nation and from institution to institution, and this has been a cause for concern for almost 50 years. Without a doubt, depression is a major contributor to





psychological illness globally, and it is now the most commonly reported obstacle to academic performance among medical students at many institutions of higher learning, including medical universities in Zambia (Bayram & Bilgel, 2008).

This study sought to assess prevalence and comorbidity of anxiety and depression prevalence amongst medical students at University A and University B. I should be quick to mention that this was necessitated by the rigid environment created in medical school which has made many students over the years fail to cope with increased pressure which ultimately leads to psychological distress. Discussion of findings will be outlined as per research question.

### **Research question 1: What is the prevalence and level of anxiety and depression amongst medical students?**

The study revealed that the prevalence of depression amongst the participants was 68%. Further analysis also showed that majority of the participants (28.72%) had mild depression while only 9.04% experienced severe forms. It further showed that prevalence amongst females is higher than that in males ( $p < 0.01$ ). Factors such as year of study, institution and age did not seem to play a role. The information gathered from this study is in agreement with a cross sectional correlational study conducted at University A in Lusaka which revealed that the prevalence of depression at the institution is 58.3%. Furthermore, the study also showed that males were three times more likely to develop depression as compared to their female counterparts which is however not in agreement with our study. (Madondo & Ravi, 2019).

The prevalence of depression among medical students in this study was however higher as compared to those from a number of studies. For example, a study among US medical students reported a prevalence of 16.4%, similar to 16.2% among 1068 medical students in a public Medical School in Mexico. In this study, the prevalence was higher when compared to some other studies, including the prevalence of 6.6% reported in clinical students in the United Kingdom and 3.4 in first-year German medical students. The reason for these varied prevalence rates can be to the differences in diagnostic criteria and cut-off points, use of diagnostic versus screening instruments and the use of self-report scales that vary significantly in their sensitivity and specificity for detecting depression (Sani, Bello, Auwal, & Musa, 2021)

The prevalence of anxiety on the other hand was 70%. Further analysis also showed that majority of the participants (33.2%) have mild anxiety while only 11.7% experience severe anxiety. Being a female was highly predictive of anxiety symptoms. Other factors such as age, institution, and year of study just as with depression did not seem to play a role.

Similar results were presented by in a cross sectional study among medical students of Ethiopia as the prevalence was 45.3%. Anxiety in this study was attributed to the bulk of academic material and fear of failing exams. Furthermore, it was found that anxiety was more prevalent in females. This however can be attributed to the possibility that males are less likely to disclose psychological suffering and seek help, compared to females (Kebede, Anbessie & Ayano 2019) In addition, a study by Mayer (2016) indicates that, at least 25% of medical students are dealing with psychological issues that have their roots in their academic preparation. 41% of pupils had depressive symptoms whereas 81.7% had state anxiety and 85.6% had trait anxiety.

### **Research question 2: What are the specific ways to deal with anxiety and depression among the medical students?**

In this particular study, students highlighted Seeking psychotherapy, Interventions that raise awareness on both these conditions, Talking to someone and practicing meditation as ways in which anxiety and depression can be treated among other things. Using focus interview open ended questions the majority of students representing about 50% of all respondents, revealed talking to a counsellor and seeking professional help as a way of dealing with anxiety and depression.

### **Research question 3: How often do anxiety and depression symptomology present comorbidly?**

According to this study, comorbidity of anxiety and depression was found to be 60.4% ( $p < 0.001$ ) which suggests that majority of the patients actually have both disorders. This can be backed up by evidence from a systematic review and meta-analysis involving 171 studies, the results from the study showed that in the first 5 years of receiving a diagnosis of depression more than a quarter of the patients develop anxiety disorder (Saha, et al., 2020).



TABLES

**Table 1: Gender Distribution**

|       |        | Frequency | Percent | Valid Percent |
|-------|--------|-----------|---------|---------------|
| Valid | Male   | 119       | 31.6    | 31.6          |
|       | Female | 257       | 68.4    | 68.4          |
|       | Total  | 376       | 100.0   | 100.0         |

**Table 2: Study Sample distribution in Institution**

|       |              | Frequency | Percent | Valid Percent |
|-------|--------------|-----------|---------|---------------|
| Valid | University A | 230       | 61.2    | 61.2          |
|       | University B | 146       | 38.8    | 38.8          |
|       | Total        | 376       | 100.0   | 100.0         |

**Table 3: Year of study**

|       |       | Frequency | Percent | Valid Percent |
|-------|-------|-----------|---------|---------------|
| Valid | 1     | 173       | 46.0    | 46.0          |
|       | 2     | 93        | 24.7    | 24.7          |
|       | 3     | 59        | 15.7    | 15.7          |
|       | 4     | 17        | 4.5     | 4.5           |
|       | 5     | 17        | 4.5     | 4.5           |
|       | 6     | 16        | 4.3     | 4.3           |
|       | 7     | 1         | .3      | .3            |
|       | Total | 376       | 100.0   | 100.0         |

**Table 4: Level of anxiety among the participants**

|  |                    | Frequency  | Percent      |
|--|--------------------|------------|--------------|
| Feeling nervous, anxious or on the edge    | Not at all         | 92         | 24.5         |
|  | Several Days       | 148        | 39.4         |
|  | Over half the days | 64         | 17.0         |
|  | Nearly every day   | 72         | 19.1         |
|  | <b>Total</b>       | <b>376</b> | <b>100.0</b> |
| Not being able to stop or control worrying | Not at all         | 91         | 24.2         |
|  | Several Days       | 151        | 40.2         |
|  | Over half the days | 69         | 18.4         |



|   |                    |            |              |
|---|--------------------|------------|--------------|
|   | Nearly every day   | 65         | 17.3         |
|   | <b>Total</b>       | <b>376</b> | <b>100.0</b> |
| Worrying too much about different things          | Not at all         | 65         | 17.3         |
|   | Several Days       | 153        | 40.7         |
|   | Over half the days | 65         | 17.3         |
|   | Nearly every day   | 93         | 24.7         |
|   | <b>Total</b>       | <b>376</b> | <b>100.0</b> |
| Trouble relaxing                                  | Not at all         | 140        | 37.2         |
|   | Several Days       | 131        | 34.8         |
|   | Over half the days | 73         | 19.4         |
|   | Nearly every day   | 32         | 8.5          |
|   | <b>Total</b>       | <b>376</b> | <b>100.0</b> |
| Being so restless that it's hard to sit still     | Not at all         | 198        | 52.7         |
|   | Several Days       | 102        | 27.1         |
|   | Over half the days | 43         | 11.4         |
|   | Nearly every day   | 33         | 8.8          |
|   | <b>Total</b>       | <b>376</b> | <b>100.0</b> |
| Becoming easily annoyed or irritable              | Not at all         | 125        | 33.2         |
|   | Several Days       | 145        | 38.6         |
|   | Over half the days | 60         | 16.0         |
|   | Nearly every day   | 46         | 12.2         |
|   | <b>Total</b>       | <b>376</b> | <b>100.0</b> |
| Feeling afraid as if something awful might happen | Not at all         | 130        | 34.6         |
|   | Several Days       | 132        | 35.1         |
|   | Over half the days | 56         | 14.9         |
|   | Nearly every day   | 58         | 15.4         |
|   | <b>Total</b>       | <b>376</b> | <b>100.0</b> |

**Table 5: Levels of depression among participants**

|  |                         | Frequency  | Percent      |
|--|-------------------------|------------|--------------|
| Little interest or pleasure in doing things            | Not at all              | 118        | 31.4         |
|  | Several Days            | 164        | 43.6         |
|  | More than half the days | 55         | 14.6         |
|  | Nearly every day        | 39         | 10.4         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Trouble falling or staying asleep or sleeping too much | Not at all              | 137        | 36.4         |
|  | Several Days            | 134        | 35.6         |
|  | More than half the days | 57         | 15.2         |
|  | Nearly every day        | 48         | 12.8         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Feeling tired or having little energy                  | Not at all              | 84         | 22.3         |
|  | Several Days            | 152        | 40.4         |
|  | More than half the days | 68         | 18.1         |





|  |                         |            |              |
|--|-------------------------|------------|--------------|
|  | Nearly every day        | 72         | 19.1         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Feeling down, depressed or hopeless  | Not at all              | 137        | 36.4         |
|  | Several Days            | 134        | 35.6         |
|  | More than half the days | 57         | 15.2         |
|  | Nearly every day        | 48         | 12.8         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Poor appetite or overeating  | Not at all              | 138        | 36.7         |
|  | Several Days            | 106        | 28.2         |
|  | More than half the days | 65         | 17.3         |
|  | Nearly every day        | 67         | 17.8         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Feeling bad about yourself or that you are a failure or have let yourself or your family down                            | Not at all              | 148        | 39.4         |
|  | Several Days            | 117        | 31.1         |
|  | More than half the days | 46         | 12.2         |
|  | Nearly every day        | 65         | 17.3         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
|  |                         | Frequency  | Percent      |
| Trouble concentrating on things such as reading or watching television   | Not at all              | 135        | 35.9         |
|  | Several Days            | 134        | 35.6         |
|  | More than half the days | 55         | 14.6         |
|  | Nearly every day        | 52         | 13.8         |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Moving or speaking so slowly that other people could have noticed or the opposite, being so fidgety or restless that you | Not at all              | 249        | 66.2         |
|  | Several Days            | 75         | 19.9         |
|  | More than half the days | 30         | 8.0          |
|  | Nearly every day        | 22         | 5.9          |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |
| Thoughts that you would be better off dead or of hurting yourself  | Not at all              | 260        | 69.1         |
|  | Several Days            | 59         | 15.7         |
|  | More than half the days | 30         | 8.0          |
|  | Nearly every day        | 27         | 7.2          |
|  | <b>Total</b>            | <b>376</b> | <b>100.0</b> |

**Table 6: Comorbidity of Depression and Anxiety**

|            |         | Anxiety |         | Total | P – value |
|------------|---------|---------|---------|-------|-----------|
|            |         | Absent  | Present |       |           |
| Depression | Absent  | 86      | 35      | 121   | <0.001    |
|            | Present | 28      | 227     | 255   |           |
| Total      |         | 114     | 262     | 376   |           |

FIGURES

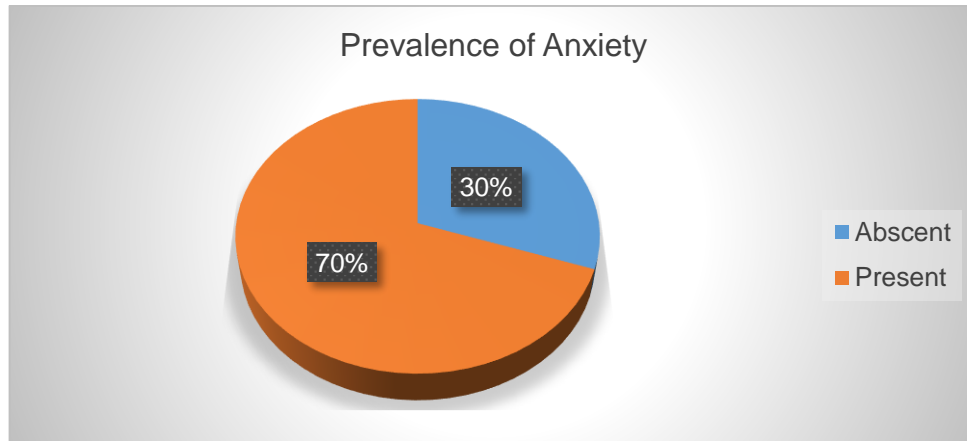


Figure 1: Prevalence of anxiety

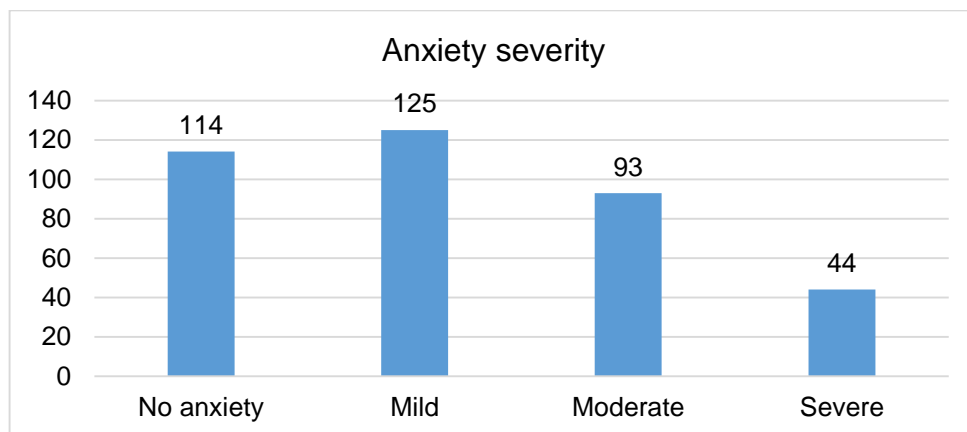


Figure 2: Anxiety severity

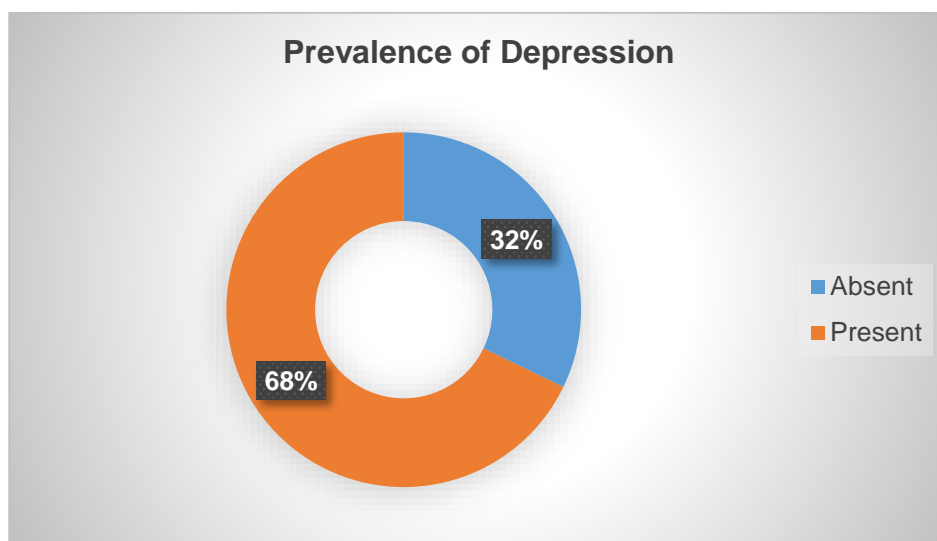


Table 3: Prevalence of Depression

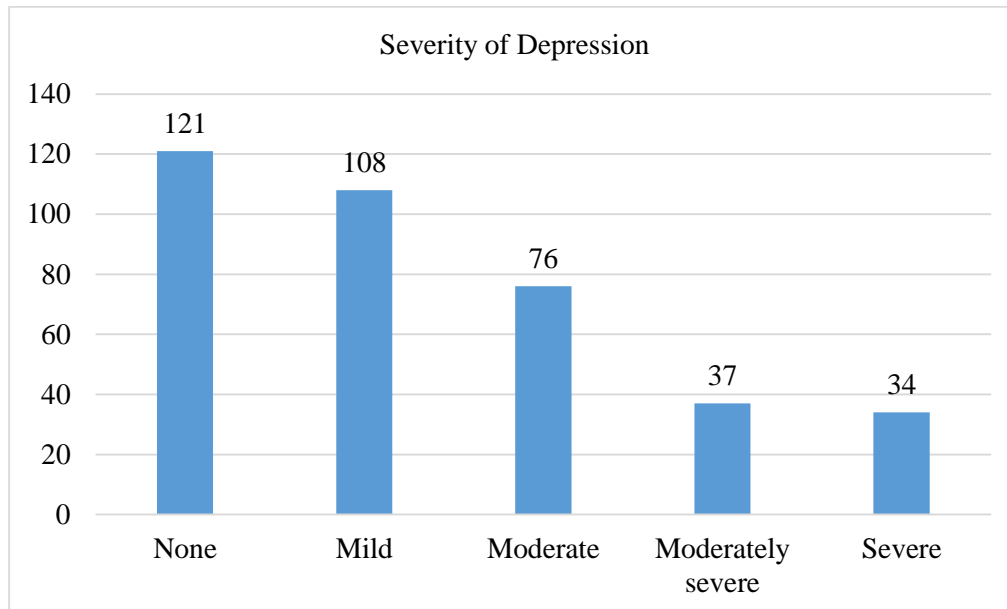


Figure 4: Severity of depression among participants

REFERENCES

1. Al-Ani Radeef and F. Ghazi, “Depression, anxiety and stress among undergraduate science students in Malaysia,” in *Proceedings of the 17th Johor Mental Health Conference*, Malaysia, 2015 April.
2. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, et al. Prevalence of mental disorders in Europe: results from the European study of the epidemiology of mental disorders (ESEMeD) project. *Acta Psychiatr Scand*. 2004;109:21–7. <https://doi.org/10.1111/j.1600-0047.2004.00327.x>
3. Andrews, B., & Wilding, J. M. (2004). The relation of depression and anxiety to life-stress and achievement in students. *British Journal of Psychology*, 95(4), 509-521.
4. Arslan, G., Ayranci, U., Unsal, A., & Arslantas, D. (2009). Prevalence of depression, its correlates among students, and its effect on health-related quality of life in a Turkish university. *Upsala journal of medical sciences*, 114(3), 170-177
5. B. Kulsoom and N. Afsar, “Stress, anxiety, and depression among medical students in a multiethnic setting,” *Neuropsychiatric Disease and Treatment*, vol. 11, pp. 1713–1722, 2015.
6. Basnet B, Jaiswal M, Adhikari B, Shyangwa PM. Depression among undergraduate medical students. *Kathmandu Univ Med J (KUMJ)*. 2012; 10(39):56–9. <https://doi.org/10.3126/kumj.v10i3.8021>
7. Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students’. *Social Psychiatry and Psychiatric Epidemiology*, vol 43, no 8, pg 667-672.
8. Brenneisen Mayer, F., Souza Santos, I., Silveira, P.S.P. et al, 2016. Factors associated to depression and anxiety in medical students: a multicenter study’. *BMC Med Educ* 16, 282, viewed 16 August 2022, <https://doi.org/10.1186/s12909-016-0791-1>
9. E. Guthrie, D. Black, C. Shaw, J. Hamilton, F. Creed, and B. Tomenson, “Psychological stress in medical students: a comparison of two very different university courses,” *Stress Medicine*, vol. 13, pp. 179–184, 1997.
10. Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77(4), 534-542.
11. Gallagher, R. P., Weaver-Graham, W., & Taylor, R. (2005). *National Survey of Counseling Center Directors, 2005*. Alexandria, VA: International Association of Counseling Centers.
12. H. Abdulghani, “Stress and depression among medical students: a cross sectional study at a medical college in Saudi Arabia,” *Pak J Med Sci*, vol. 24, pp. 12–17, 2008.



13. H. Worley, 2006. Depression, a leading contributor to Global burden of disease'. *World and U.S population trends*, viewed 16 August 2022, <https://www.prb.org/resources/depression-a-leading-contributor-to-global-burden-of-disease/>
14. Harry Jordan Silomba, et.al. Association between Social Media Addiction and Depression of Students in Colleges of Education on the Copperbelt Province, Zambia'. *International Journal of Humanities Social Sciences and Education IJHSSE*, vol 8, no. 2, pp. 157-165, viewed on 15 August 2022, <https://doi.org/10.20431/2349-0381.0802015>
15. J. Wong, E. Cheung, K. Chan, K. Ma, and S. Tang, "Web-based survey of depression, anxiety and stress in first-year tertiary education students in Hong Kong," *Australian and New Zealand Journal of Psychiatry*, vol. 40, pp. 777–782, 2006.
16. K. Shamsuddin, F. Fadzil, A. Ismail, S. Shah, K. Omar, and N. Muhammad, "Correlates of depression, anxiety, and stress among Malaysian university students," *Asian J Psychiatr*, vol. 6, pp. 318–323, 2013.
17. Kessler RC, Üstün TB. The world mental health (WMH) survey initiative version of the world health organization (WHO) composite international diagnostic interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13(2):93–121. <https://doi.org/10.1002/mpr.168>.
18. L. N. Dyrbye, M. R. Thomas, and T. D. Shanafelt, "Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. And Canadian medical students," *Academic Medicine*, vol. 81, no. 4, pp. 354–373, 2006.
19. M. Aktekin, T. Karaman, Y. Y. Senol, S. Erdem, H. Erençin, and M. Akaydin, "Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey," *Medical Education*, vol. 35, no. 1, pp. 12–17, 2001.
20. M. Fuad, B. Al-Zurfi, M. Abdelqader, M. Abu Bakar, M. Elnajeh, and M. Abdullah, "Prevalence and risk factors of stress, anxiety and depression among medical students of a private medical university in Malaysia," *MJPHM*, vol. 16, pp. 87–92, 2016.
21. M. Yusoff, A. Abdul Rahim, A. Baba, S. Ismail, P. M. Mat, and A. Esa, "Prevalence and associated factors of stress, anxiety and depression among prospective medical students," *Asian Journal of Psychiatry*, vol. 6, pp. 128–133, 2013
22. Mao Y, Zhang N, Liu J, Zhu B, He R, Wang X, 2019. A systematic review of depression and anxiety in medical students in China'. *BMC Med Educ*, vol 19, no 1, viewed on 18 August 2022, <https://bmcmmeduc.biomedcentral.com/track/pdf/10.1186/s12909-019-1744-2.pdf>
23. National institute of Mental Health (2021). Frequently asked questions about suicide'. *NIH*, no 21-MH-6389, viewed on 16 August 2022, <https://www.nimh.nih.gov/health/publications/suicide-faq>
24. Onyishi M, Talukdar D, Sanchez R, Olaleye AO, Medavarapu U, 2016. Prevalence of clinical depression among medical students and medical professionals: A systematic review study'. *Arch Med*, vol 8, no 6, <https://doi.org/10.21767/1989-5216.1000178>
25. Puthran R, Zhang MW, Tam WW, Ho RC, 2016. Prevalence of depression amongst medical students: a meta-analysis study'. *Med Educ*, viewed on 16 August 2022, <https://pubmed.ncbi.nlm.nih.gov/26995484/>
26. Quince TA, Wood DF, Parker RA, et al, 2012. Prevalence and persistence of depression among undergraduate medical students: a longitudinal study at one UK medical school'. *BMJ Open*, vol 2, no 1, viewed on 14 August 2022, <https://bmjopen.bmj.com/content/2/4/e001519/>
27. Robert MA, Hirschfeld MD, 2001. The comorbidity of major depression and anxiety disorders: recognition and management in primary care'. *Primary Care Companion J Clin Psychiatry*, vol 3, no 6, viewed on 15 August 2022, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC181193/>
28. Rosal MC, Ockene IS, Ockene JK, Barrett SV, Ma Y, Hebert JR. A longitudinal study of students' depression at one medical school. *Acad Med*. 1997;72(6): 542–6. <https://doi.org/10.1097/00001888-199706000-00022>.
29. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, Sen S, Mata DA, 2016. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis'. *JAMA*, vol 6, no 21, viewed on 17 August 2022, <https://doi.org/10.1001/jama.2016.17324>
30. S. Baldassin, T. C. d. T. F. Alves, A. G. de Andrade, and L. A. Nogueira Martins, "The characteristics of depressive symptoms in medical students during medical education and training: a cross-sectional study," *BMC Medical Education*, vol. 8, no. 1, p. 60, 2008.
31. S. Inam, A. Saqib, and E. Alam, "Prevalence of anxiety and depression among medical students of private university," *Journal of Pakistan Medical Association*, vol. 53, pp. 44–47, 2003.



32. S. Patil, S. Sadhanala, and S. BansodeGokhe, "Study of depression, anxiety and stress among undergraduate medical students of A teaching medical institution," *Natl J Community Med*, vol. 9, pp. 566–569, 2018.
33. S. Sarkar, R. Gupta, and V. Menon, "A systematic review of depression, anxiety, and stress among medical students in India," *J Mental Health Hum Behav*, vol. 22, pp. 88–96, 2017.
34. S. Stewart, T. Lam, C. Betson, C. Wong, and A. Wong, "A prospective analysis of stress and academic performance in the first two years of medical school," *Medical Education*, vol. 33, no. 4, pp. 243–250, 1999.
35. Sarokhani D, Delpisheh A, Veisani Y, Sarokhani MT, Manesh K, Sayehmiri K, 2013. Prevalence of depression among university students: a systematic review and meta-analysis study'. *Hindawi Publishing Corporation Depression Research and Treatment*, vol 2, no 13, viewed on 16 August 2022, <http://dx.doi.org/10.1155/2013/373857> p. 7 373857/
36. Smith CK, Peterson DF, Degenhardt BF, Johnson JC. Depression, anxiety, and perceived hassles among entering medical students. *Psychol Health Med*. 2007;12(1):31–9. <https://doi.org/10.1080/13548500500429387>.
37. Spitzer RL, Kroenke K, Williams JB, et al, 2016. A brief measure for assessing generalized anxiety disorder: the GAD-7'. *Arch Intern Med*, viewed on 15 August 2022, [http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=16717171](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=16717171)
38. Steptoe A, Tsuda A, Tanaka Y, Wardle J. Depressive symptoms, socio- economic background, sense of control, and cultural factors in university students from 23 countries. *Int J Behav Med*. 2007;14(2):97–107. <https://doi.org/10.1007/BF03004175>.
39. Torres F, 2020. 'What Is Depression?' *American Psychiatric Association*, vol 03, no 1, viewed 15 August 2022, <https://www.psychiatry.org/patients-families/depression/what-is-depression>
40. Van Venrooij LT, Barnhoorn PC, Giltay EJ, van Noorden MS. Burnout, depression and anxiety in preclinical medical students: a cross-sectional survey. *Int J Adolesc Med Health*. 2015;29(3). <https://doi.org/10.1515/ijamh-2015-0077>.
41. Wafaa Yousif Abdel Wahed & Safaa Khamis Hassan, 2017. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students', *Alexandria Journal of Medicine*, vol 53 no 1, pg 77-84, viewed on 16 August 2022, <https://www.researchgate.net/publication/295395000> Prevalence and associated factors of stress anxiety and depression among medical Fayoum University students
42. WHO, 2021. Depression', viewed on 17 August 2022, <https://www.who.int/news-room/fact-sheets/detail/depression>