

Original Research Article

Stress, Anxiety and Depression among Diploma Nursing Students at Levy Mwanawasa Medical University- Lusaka, Zambia

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Abstract: *Introduction:* Nursing students frequently experience high levels of stress, anxiety and depression, which can impact their mental health and academic performance (Yonca, 2023; Fauzi *et al.*, 2021). At Levy Mwanawasa Medical University (LMMU), there is an urgent concern regarding the mental health of nursing students, despite available counselling services and academic support. *Objective:* This study aimed to determine the levels of stress, anxiety and depression among diploma nursing students at LMMU. *Methodology:* A descriptive cross- section design was utilized, involving 198 diploma nursing students selected through stratified simple random sampling. Data were collected through self-administered questionnaire and analysed using SPSS version 27, employing binary logistic regression and Chi-Square tests to examine relationships between variables. *Results:* The participants ages (17- 36) were predominantly female (80.8%) and unmarried (92.9%). Moderate levels of stress, anxiety and depression were reported at 36.4%, 49% and 59.4%, respectively. The majority of the students (85.4%) stayed outside the campus while only 29 (14.7%) stayed within campus. The study found that factors such as age, gender, family history of mental illness, marital status, academic and financial pressures and living arrangements did not show statistically significant associations with moderate to high levels of depression among diploma nursing students at LMMU, despite some findings suggesting trends (e.g., younger age correlating with lower depression and living- off campus being linked to higher depression) Female students were observed to be 0.49 times less likely to develop moderate to high depression compared to males, while those from families with a history of mental illness were 1.22 times more likely to experience increased depression however, these associations were not statically significant ($P>0.05$). Notably, students who frequently experienced negatives thoughts were 1.82 times more likely to report moderate to high depression, a statistically finding ($P<0.05$). *Conclusion:* Nursing students' mental health can be negatively affected by environmental factors, mental health history, and negative thinking. To support their mental well-being, it's recommended to implement counselling services, mental health screenings, and improved counselling facilities.

Keywords: Diploma nursing students; Stress; Anxiety; Depression; Mental health; Levy Mwanawasa Medical University.

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INTRODUCTION

Background Information

Nursing students face tremendous stress, anxiety and depression during their student life and this

may lead to physical and mental health problems, and poor academic performance (Yonca, 2023). Mental health is considered a vital part of well-being and poor mental health is associated with decreased productivity such as poor academic performance among diploma

nursing students (Fauzi *et al*, 2021). Additionally stress, anxiety and depression may have negative impact on social dynamics between peers and teachers, and these in turn can produce more stress, anxiety and depression that consequently may trigger mental health problems among diploma nursing students (Sanad, 2019).

In Zambia evidence relating to stress, anxiety and depression among diploma nursing students in is limited (Lino *et al.*, 2022)

Stress is a feeling that is initiated when a person perceives that demands exceed resources mobilized by the individual (Njim *et al*, 2020) The term comprises the physiological and psychological responses that prepare the organism to cope with stimulus called stressors which are interpreted as challenging to the individual (Pengpid and Peltzer, 2021). Stress responses in nursing students vary in duration and intensity during their academic training and final effects depend on the coping mechanisms, individual resources, and hospital environment. Manpreet and Maheshwari, (2019) reveals that the process of education is a stressful experience and students may encounter a great deal of academic, personal, and social challenges stress during their learning.

On the other hand, anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes in the body. In moderate levels, anxiety stimulates anticipatory and adaptive responses to challenging and stressful events (Cestari *et al*, 2019). Furthermore, it has been found that the clinical training taking place during nursing education triggers more levels of anxiety than the theoretical aspect (Omer *et al*, 2023) Like stress, anxiety has a negative effect on the quality of students' life, their education and clinical practice (Sanad, 2019). According Hwang and Kim, (2022) nursing students reported higher levels of anxiety than the overall population of students and this has been attributed to course structure, long hours of clinical experiences, and working with very sick persons. Excessive anxiety in nursing students can have negative health, academic, economic, and patient care outcomes, as well as impact future role transition into professional practice, including burnout and poor job performance (Syed, 2021). Eid *et al*, (2018) and Naeim *et al*, (2020) report that some sources of anxiety such as courses' structure, clinical experiences, and lack of faculty support, working with sick persons, and fear of failing their examinations among others considered unique to diploma nursing students, and may contribute to anxiety and even depression.

Depression is a condition that is marked by sadness, emptiness, hopelessness, and loss of interest for most of the day (American Psychiatric Association, 2013). In Greece, the prevalence of depressive symptoms among nursing students was reported between 44 and 52 percent while in Thailand, 50 percent of diploma nursing

students scored above the cutoff point of depression scale (Yousef *et al*, 2017). Depression has an impact on productivity, motivation to work, sleep behavior of the individual, and outcome of different chronic diseases (Dalky, 2019). Failure to detect and address to these emotional disorders may lead to increased psychological morbidity with undesirable impacts among diploma nursing students (Saravanan & Wilks, 2014). Moreover, a high level of depression has been shown to negatively affect academic performance and is associated with higher levels of alcohol and substance misuse among diploma nursing students (Eid *et al*, 2018).

Therefore, exploring stress, anxiety and depression among diploma nursing students in Zambia will create awareness about the growing mental health problems and associated negative consequences. Stress, anxiety, and depression are prevalent mental health concerns among diploma nursing students, potentially affecting their well-being and academic performance (Study of stress, anxiety, depression and coping strategies among nursing students in a tertiary care teaching hospital, South India, 2021) According to a study by Quek *et al*. (2019), nursing students often face significant stressors due to the demanding nature of their coursework and clinical placements. Additionally, a meta-analysis conducted by Harkin and Melby (2019) revealed a high level of anxiety and depression among diploma nursing students, attributing it to academic pressures and the emotional demands of patient care.

At Levy Mwanawasa Medical University, there is a growing concern regarding the mental health of Diploma nursing students. This is evidenced by anecdotal reports from faculty members and observations of increased absenteeism and reduced academic performance among diploma nursing students. Despite efforts to support students' well-being through counselling services and academic accommodations, the levels of stress, anxiety, and depression remains high evidenced by the number cases from students' clinic at Chainama Hills hospital.

MATERIALS AND METHOD

Aims: To determine the levels of stress, anxiety, and depression among diploma nursing students at Levy Mwanawasa Medical University. Specificity to identify the biological factors contributing to stress, anxiety and depression among nursing students To determine the psychological factors that play a role in stress, anxiety, and depression among nursing students. To examine the influence of social factors on stress, anxiety and depression among nursing students.

Study design: A descriptive cross-sectional research design was used to collect data.

Study Settings: The study took place at Levy Mwanawasa Medical University (LMMU). LMMU is a Public University and the first specialized University for

health studies in Lusaka, Zambia. Its main campus is situated on Chainama Hill in Northeastern Lusaka. The School of Nursing at LMMU is a well-known institution both nationally and internationally for its excellence in educating and training healthcare workers for Zambia and the Southern Africa region. Among the programs offered by LMMU, A variety of programs with a primary concentration on health sciences are available at Mwanawasa Medical University, including: Medicine: A demanding curriculum that trains students to become doctors. Both in-depth academic knowledge and hands-on training are part of the program.

The School of Nursing provides pre-service registered nursing. Nursing with a focus on clinical skills and compassionate care, this curriculum prepares students in patient care, health promotion, and illness prevention.

Both domestic and foreign students make up the diversified student body at Mwanawasa Medical University. Among the elements affecting their academic experience that may lead stress, anxiety and depression are: Cultural Context. It may be difficult for students from diverse cultural backgrounds to fit in school. Socioeconomic Status Students' access to resources might be hampered by financial constraints, which can cause stress and academic issues. Academic Readiness Different backgrounds can have an impact on a student's preparedness for the demanding nature of medical school.

The selection of the study area was based on interest in addressing research problems for diploma nursing student's familiarity with the local context, and the goal to simplify the data collection process. This decision, beyond convenience, was enhanced access to participants, provide logistical ease, contribute to cultural understanding, address ethical considerations, improve data quality, and leverage existing resources.

Study Population

The study population for this research was diploma nursing students enrolled at Levy Mwanawasa Medical University. The sample size included a diverse representation of students from different backgrounds, ages, and genders to ensure the findings were generalizable to the entire diploma nursing student population at the university.

Target Population

The target population were all students from Levy Mwanawasa Medical University, School of Nursing Diploma nursing who had been in training for more than six months and from 1st year, 2nd year and 3rd year academic studies.

The current study therefore, used the Cochran's (1998) statistical power analysis as a guideline for

estimating the desired sample size. As per calculation of the total sample from the population of 406.

The sample size was calculated using Cochran's formular for finite populations, as follows.

$$\frac{N \cdot z^2 \cdot p \cdot (1 - P)}{E^2(N - 1) + z^2 p (1 - p)}$$

Where:

- n= required sample size
- N= population size
- z= z-score (the number of standard deviations from the mean) corresponding to the desired confidence level (e.g., z=1.96z=1.96 for a 95% confidence level)
- p = estimated proportion of the population (e.g., p=0.5p=0.5 is often used for maximum variability)
- E= margin of error (e.g., E=0.05E=0.05 for 5% margin of error)

Population size (N)

Plugging these values into the formula:

1. Calculate the numerator:

$$N \cdot z^2 \cdot p \cdot (1 - p) = 406 \cdot (1.96)^2 \cdot 0.5 \cdot (1 - 0.5) \\ N \cdot z^2 \cdot p \cdot (1 - p) = 406 \cdot (1.96)^2 \cdot 0.5 \cdot (1 - 0.5) \\ = 406 \cdot 3.8416 \cdot 0.5 \cdot 0.5 = 406 \cdot 3.8416 \cdot 0.25 \approx 389.98 = 406 \cdot 3.8416 \cdot 0.5 \cdot 0.5 = 406 \cdot 3.8416 \cdot 0.25 \approx 389.98$$

2. Calculate the denominator:

$$E^2 \cdot (N - 1) + z^2 \cdot p \cdot (1 - p) = (0.05)^2 \cdot (406 - 1) + (1.96)^2 \cdot 0.5 \cdot (1 - 0.5) \\ E^2 \cdot (N - 1) + z^2 \cdot p \cdot (1 - p) = (0.05)^2 \cdot (406 - 1) + (1.96)^2 \cdot 0.5 \cdot (1 - 0.5) \\ = 0.0025 \cdot 405 + 3.8416 \cdot 0.25 = 1.0125 + 0.9604 \approx 1.9729 = 0.0025 \cdot 405 + 3.8416 \cdot 0.25 = 1.0125 + 0.9604 \approx 1.9729$$

3. Calculate the final sample size *nn*:

$$n = 389.98 / 1.9729 \approx 197.57 \\ n = 389.98 / 1.9729 \approx 197.57 \\ \text{Rounding gives } n \approx 198 \approx 198$$

Sampling Technique

In selecting the participants, a stratified simple random sampling technique was used. The population was categorized into distinct subgroups, or strata, which was based on specific variables relevant to the study, ensuring that each individual belongs exclusively to one stratum. A wide range of population characteristics was utilized to define these subgroups, including different academic levels (e.g., year 1, year 2, year 3) and age to make research on nursing students more inclusive and accurate. Then, from each of these smaller groups. The sample frame of each of the nursing level was obtained by list of all nursing student in that level. Then, sequential numbers assigned to each of the respondent to form the sample frame. A random number generator was used to generate random numbers and register the name in the sample frame corresponding to the numbers to constitute the sample for that particular level. This

continued until the required number was met for the data collection to ensure everyone within a group had an equal chance of being chosen. This approach helps represent the diversity of the student body more fairly and also provides more precise results by accounting for variations within these groups. The sample size was determined based on statistical power calculations to ensure the study's validity and reliability building a sense of trust and collaboration. This interpersonal engagement was encouraged to participants to provide truthful responses, contributing to the overall reliability of the collected data.

Inclusion and Exclusion Criteria

Burns and Groves (2017) define inclusion criteria as characteristics that a subject of the target population must possess, while exclusion criteria will be defined as characteristics that will cause one to be eliminated from the study.

Inclusion Criteria

Enrolment Status: All year diploma Nursing students who were willing to participate in the study and available during the period of data collection were included and who were on face-to-face learning on campus participated in the study.

Students more than 6 months in training: Student who were in training for more six.

Exclusion Criteria

The research adopted certain exclusion parameters to help narrow down the participant eligibility and make sure that relevant information was gathered within the set requirements. Students had health issues or Students who had undergone treatment for severe mental health issues or medication for mental illnesses.

Leave of Absence: Withdrawal from Program Any students who had formally withdrawn from their program during the study timeframe. Students who did not attend the lessons or were in clinical practicum were excluded from the study. This exclusion was necessary in order to focus on students who were actively participating in the campus-based learning.

Existing Mental Health Conditions: Students a diagnosed with mental health condition that required ongoing treatment or intervention were excluded from the study. This was to minimize the impact of pre-existing conditions on the study's findings and to focus on the effects of the nursing program itself on mental health.

Data Analysis Process

Version 27 of the Statistical Package for Social Science (SPSS) software was used to organise the data before it was entered and examined. Using SPSS version

27.0, the responses to 198 self-administered questionnaires were edited, coded, and scored. The editing process was used to verify whether respondents followed instructions exactly and whether all items on the questionnaire were answered.

Data Validity and Reliability A pretest of the structured questionnaire was administered to a small sample of medical school students in order to guarantee the validity and reliability of the data. Since the tool's adoption, the pretest evaluated the questionnaire's comprehensiveness, consistency, and clarity within the local context.

Ethical Consideration

Ethical clearance

Ethical clearance from UNZABREC and NHRA.

Permission from study area

As part of the research process, permission was sought from the school authorities from the school of nursing and midwifery as the study sites. The protocol was presented with the participant information sheet to keep the authorities abreast with the kind of data to be collected. Copies of clearance letters and permission to proceed with the study were available To Whom It May Concern. Permission from the research site authorities Signing of the consent form by the participants Confidentiality was ensured All those who had emotional disturbance raised due to the study exposure, the necessary therapy was made available for free of charge or at the researchers cost.

Anonymity and confidentiality

The researchers ensure anonymity by not recording the names of participants. Participants were assured of confidentiality and anonymity that under no circumstance will their names and other details be linked to the data analysis and dissemination of findings of the study.

The participants responses were given IDs. Identifiers such as names, phone numbers, and addresses, among others were not part of data to be collected. Data management, storage, analysis and reporting were done using IDs which did not exposed the participants.

Participation in the study voluntarily and withdrawal:

To get informed consent, participants were given a thorough explanation of every study procedure. They were informed that participation in the study is completely voluntary and that they can leave at any moment without suffering any consequences.

Demographic Features of the Respondents

These results in figure 1 provide an overview of the demographic characteristics of the students who participated in the study

Table 4: Demographic Characteristics of the Study Participants (n=198)

	Frequency, Mean	Percent (%), SD
Age (Years)	22.4 ^m	2.7
Gender		
Male	38	19.2
Female	160	80.8
Marital Status		
Single	184	92.9
Married	11	5.6
Divorced	2	1.0
Widowed	1	0.5
Year of Study		
First	80	40.4
Second	57	28.8
Third	61	30.8
Place of Residence		
Within Campus	29	14.7
Outside Campus	169	85.4

Demographic Characteristics of Study Participants

Understanding the demographic characteristics of diploma nursing students who participated in study were essential for informing stake holders and policy makers health interventions and tailoring healthcare services. A total of 198 students were included in the study. The age of the participants was ranging from 17 to

36 years old. More than half (80.8%) and 18 (92.9) of the students were females and not married respectively. The majority of the students (85.4%) stayed outside the campus while only 29 (14.7%) stayed within campus who met the inclusion criteria, providing valuable insights into the socio-economic and educational backgrounds of this population.

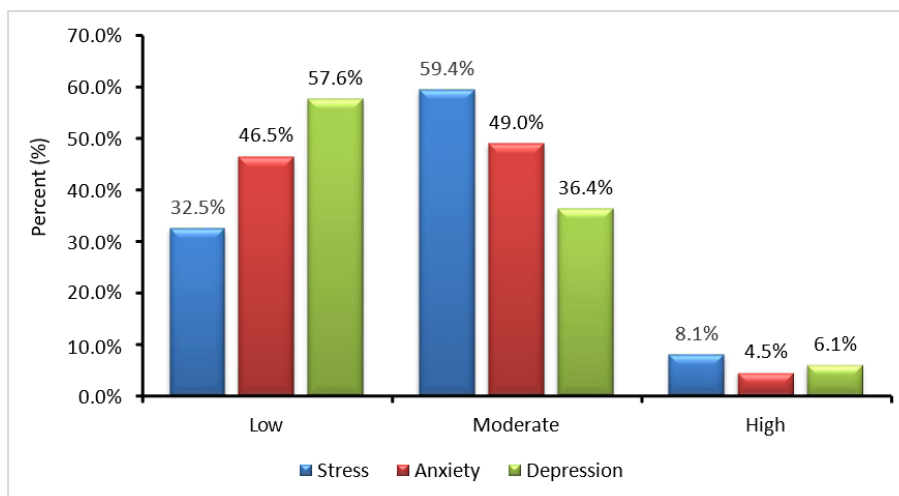


Figure 2: Levels of Stress, anxiety and Depression among Diploma Nursing Students at LMMU

Levels of Stress, Anxiety and Depression among Nursing Diploma Students at Levy Mwanawasa Hospital

The level of moderate stress, anxiety and depression in this study was found to be 36.4%, 49% and 59.4% among the diploma nursing students at LMMU

respectively. Furthermore, the study found that approximately six-point one percent (6.1%), four point five (4.5%) and eight-point one percent (8.1%) of the diploma students had high levels of stress, anxiety and depression.

Table 5: Factors associated with Moderate to High Levels of Stress among Diploma students at LMMU

	OR	P>z	95% CI
Biological Factors			
Age (Years)	0.92	0.25	0.81,1.06
Gender			
Male	Ref		
Female	0.51	0.08	0.24,1.09

Family History of Mental Illness			
No	Ref		
Yes	1.51	0.29	0.70,3.25
Presence of Chronic Physical Pain			
No	Ref		
Yes	1.27	0.72	0.34,4.79
Previously Diagnosed with Mental Illness			
No	Ref		
Yes	4.81	0.05	1.00,23.2
Psychological Factors			
Experience of Negative Thinking			
No	Ref		
Yes	1.73	0.01	1.15,2.61
Management of Stress			
Poor			
Good	0.90	0.67	0.54,1.48
Social Factors			
Year of Study			
First	Ref		
Second	0.81	0.60	0.37,1.78
Third	1.50	0.32	0.68,3.33
Marital status			
Single	Ref		
Married	2.63	0.13	0.76,9.10
Residence			
On Campus	Ref		
Outside Campus	3.30	0.01	1.35,8.08
Support from Family and Friends			
Poor	Ref		
Good	0.63	0.01	0.44,0.89
Cultural Influence			
Disagreed	Ref		
Agree	0.98	0.83	0.81,1.18
Environmental causes of stress			
Rarely	Ref		
Frequent	1.38	0.05	1.00,1.92

Associated factors with Moderate to High Levels of Stress among Diploma Nursing students at LMMU.

The ordinal regression model shows that only the factors that had a significant relationship with moderate to high stress among the students were place of residence, history of diagnosis of mental illness, tendency to have negative thoughts and the environmental causes of stress such as finances and academic pressure. Regarding age, the study found that a unit increase in the age was associated with a 0.92

decrease in the levels of moderate to high stress among diploma nursing students at LMMU but the observed association was statistically not significant (P-value>0.05). The study found that a student who was previously diagnosed with a mental health illness was 4.81 times more likely to have moderate to high levels of stress and this increase could be as high as 23.2 to as low as 1.00 when adjusted for other variables in the study (P-value≤0.05).

Factors associated with Moderate to High Levels of Anxiety among Diploma students at LMMU

	OR	P>z	[95% Conf.
Biological Factors			
Age (Years)	0.83	0.01	0.72,0.95
Gender			
Male	Ref		
Female	0.81	0.58	0.38,1.73
Family History of Mental illness			
No			
Yes	1.79	0.14	0.83,3.88

Presence of Chronic Physical Pain			
No			
Yes	0.83	0.78	0.23,3.03
Previously Diagnosed with Mental Illness			
No			
Yes	0.23	0.10	0.04,1.35
Psychological Factors			
Experience of Negative Thinking			
No			
Yes	1.56	0.03	1.03,2.36
Management of Stress			
Poor			
Good	0.50	0.01	0.30,0.82
Social Factors			
Year of Study			
First			
Second	0.93	0.86	0.43,2.02
Third	0.72	0.42	0.33,1.59
Marital status			
Single			
Married	2.43	0.17	0.69,8.54
Residence			
On Campus			
Outside Campus	2.08	0.11	0.84,5.14
Support from Family and Friends			
Poor			
Good	0.80	0.20	0.57,1.12
Cultural Influence			
Disagreed			
Agree	0.96	0.69	0.80,1.16
Environmental causes of stress			
Rarely			
Frequent	1.10	0.56	0.80,1.53

Associated factors with Moderate to High Levels of Anxiety among Diploma Nursing students at LMMU

Regarding anxiety, the multivariate ordinal regression shows that a unit increase in the age was associated with 0.83 times decrease in the levels of moderate to high anxiety among the diploma nursing students at LMMU and the observed association was statistically significant (P -value <0.05) when adjusted for other variables in the study. The study also found that students coming from families with a history of mental illness were 1.79 times more likely to have increased levels of moderate to high anxiety as compared to students whose families have no history of mental health illness but the observed association was not statistically significant (P -value >0.05). Similarly, to our findings

with stress, the study observed that students who are more prone to experience negative thoughts were at higher risk of developing moderate to high levels of anxiety (AOR: 1.56, 95% CI: 1.03,2.36) as compared to students who rarely experienced negative thoughts and the observed association was statistically significant (P -value <0.05). Students who had good stress management techniques were 0.50 times less likely to develop moderate to high levels of anxiety compared to students with poor stress coping systems and this decrease could be as low as 0.30 to as high as 0.80. Married students were 2.43 times more likely to have increased levels of moderate to high anxiety compared to students who were single and the observed association was not statistically significant (P -value >0.05).

Factors associated with Moderate to High Levels of Depression among Diploma students at LMMU

	OR	P>z	95% CI
Biological Factors			
Age (Years)	0.96	0.57	0.84,1.10
Gender			
Male			
Female	0.49	0.07	0.23,1.05

Family History of Mental Illness			
No			
Yes	1.22	0.62	0.55,2.71
Presence of Chronic Physical Pain			
No			
Yes	1.37	0.63	0.38,4.87
Previously Diagnosed with Mental Illness			
No			
Yes	1.02	0.98	0.22,4.65
Psychological Factors			
Experience of Negative Thinking			
No			
Yes	1.82	0.01	1.19,2.79
Management of Stress			
Poor			
Good	0.65	0.08	0.40,1.05
Social Factors			
Year of Study			
First			
Second	1.20	0.65	0.55,2.60
Third	0.90	0.81	0.40,2.05
Marital status			
Single			
Married	2.94	0.07	0.91,9.47
Residence			
On Campus			
Outside Campus	2.46	0.07	0.92,6.53
Support from Family and Friends			
Poor			
Good	0.77	0.13	0.54,1.08
Cultural Influence			
Disagreed			
Agree	1.04	0.68	0.86,1.26
Environmental causes of stress (Finance or Academic pressure)			
Rarely			
Frequent	1.17	0.35	0.84,1.63

Factors associated with Moderate to High Levels of Depression among Diploma Nursing students at LMMU.

Regarding depression, the multivariate ordinal regression shows that a unit increase in the age was associated with 0.96 times decrease in the levels of moderate to high depression among the diploma nursing students at LMMU and the observed association was statistically not significant (P -value >0.05) when adjusted for other variables in the study. Regarding gender, the study found that female diploma nursing students were 0.49 times less likely to develop increased levels of moderate to high depression as compared to male diploma nursing students at LMMU but the observed association was statistically not significant (P -value >0.05). The study also found that students coming from families with a history of mental illness were 1.22 times more likely to have increased levels of moderate to high depression as compared to students whose families have no history of mental health illness but the observed association was not statistically significant (P -

value >0.05). Regarding psychological factors, the study observed that students who are usually experience negative thoughts were 1.82 times more likely to have increased levels of depression (moderate to high) as compared to student who did not experience negative thinking usually and the observed association was statistically significant (P -value <0.05). Students who had good stress management techniques were 0.65 times less likely to develop moderate to high levels of depression compared to students with poor stress coping systems and this decrease could be as low as 0.40 to as high as 1.05. Regarding social determinants of depression, the study observed that married students were 2.94 times more likely to have increased levels of moderate to high depression compared to students who were single and the observed association was not statistically significant (P -value >0.05) (Table 3 below). The study also found that students who have academic of financial pressure are 1.17 times more likely to develop increased levels of moderate to high depression compared to students who rarely have financial or

academic challenges and the observed association was statistically not significant (P -value >0.05). Lastly, the study also found that students who stayed outside campus were 2.46 times more likely to have increased levels of moderate to high depression as compared to students who stayed within campus but the observed association was statistically not significant (P -value >0.05).

DISCUSSION OF RESULTS

Demographic characteristics of the respondents

A total of 198 students were included in the study. The age of the participants was ranging from 17 to 36 years old. More than half (80.8%) and 184 (92.9) of the students were females and not married respectively. The majority of the students (85.4%) stayed outside the campus while only 29 (14.7%) stayed within campus.

who met the inclusion criteria, providing valuable insights into the socio-economic and educational backgrounds of this population.

Levels of Stress, Anxiety and Depression among Diploma Nursing Students at LMMU

The current study found that the overall prevalence of moderate to high stress among diploma nursing students at LMMU was 67.5%. This finding is much higher than previous studies conducted in Ethiopia, Saudi Arabia and Iraq which found that levels of stress among female students and high school students were 52.6%, 52.5% and 51.1% (Al-Abbudi, 2018; Khalid *et al.*, 2009; Nakie *et al.*, 2022). Another study conducted among first year medical students at Nepal Medical College and Teaching Hospital (NMCTH), Kathmandu, found that the prevalence of stress was 45.1% (Shah *et al.*, 2021). A study conducted among first-year medical students in an Egyptian Public University found that the prevalence of stress was 57.8% which is lower compared to our study (Roy *et al.*, 2015). Our findings are lower than a previous study conducted among medical undergraduate students at Benha University in Egypt which found that approximately 82.7% of the students had experienced stress (Abed and Abd El-Raouf, 2021; Agyapong-Opoku *et al.*, 2023). The variance between prevalence reported in this study may be attributed to the methodological differences between studies or differences in clinical scales used in the measurement of stress and the time the research was conducted.

The overall levels of moderate to high anxiety in this study was found to be 53.5%, our findings are lower than previous studies in Ethiopia, Saudi Arabia and Malaysia which found that the level of anxiety among high school students ranged from 66.2% to 67.1% (Khalid *et al.*, 2009; Nakie *et al.*, 2022; Wahab *et al.*, 2013). Similarly, another study conducted among medical undergraduate students at Benha University in Egypt found that the prevalence of anxiety was approximately 82.6% (Abed and Abd El-Raouf, 2021; Agyapong-Opoku *et al.*, 2023). Our findings are similar

to a previous study conducted among first year medical students at (NMCTH), found that the prevalence of anxiety was 59.3% (Shah *et al.*, 2021). Another study conducted among first-year medical students in an Egyptian Public University observed that the prevalence of anxiety was 78.4%, which is higher compared to our study (Roy *et al.*, 2015). The variation might be due to differences in sociocultural, socioeconomic, type of study population, and availability of health facilities between those countries and Zambia. People living in low socioeconomic countries like Zambia could have poor health care infrastructure and a shortage of trained health staff that delivers inadequate health care services. In turn, anxiety might not be early identified and treated. The current study observed that the prevalence of moderate to high levels of depression among diploma nursing at LMMU was 42.5%. This finding is consistent with a previous study conducted in Ethiopia which found that the prevalence of depression was 41.4% (95% CI: 38.0, 45.1%) (Nakie *et al.*, 2022). Similarly, others studies in Saudi Arabia, Malaysia, and China reported to the prevalence of depression to be 38.2, 41.5 39.7, and 43.3% respectively (Al-Abbudi, 2018; Khalid *et al.*, 2009; Roy *et al.*, 2015). However, the levels of depression in our study were much lower that a previous study conducted among first-year medical students in an Egyptian Public University which found that the prevalence of depression was 63.6% (Roy *et al.*, 2015). Similarly, another study conducted among medical undergraduate students at Benha University in Egypt found that approximately 88.8% had experienced depression (Abed and Abd El-Raouf, 2021; Agyapong-Opoku *et al.*, 2023). The possible reason for the variation may be due to a difference in the number of females participants between the current and previous studies. More than half of the participants in this study are females.

Levels of Stress among Diploma Nursing Students at LMMU

The current study found that increasing age and being female was associated with a decrease in the levels of moderate and high stress among diploma nursing students. However, the observed association was not statistically significant. This finding is consistent with previous. Regarding age, our finding is consistent with previous studies that show that as the increases the levels of stress decrease as well (Gijón Puerta *et al.*, 2022). Similarly, other studies have shown indicated that stress and anxiety decrease as age increases (Carstensen and DeLiema, 2018; Valiente *et al.*, 2021). Regarding gender, our findings are not consistent with a previous study which showed that female students are more anxious and stressed than male students ($p=0.000$ and $p=0.004$ respectively) (Abed and Abd El-Raouf, 2021). Also, an Indian study found that female students were more severe depressed, anxious and stressed than males (Kumar *et al.*, 2019). This gender difference may be due to the fact that females tend often to report concerns, stress, and their tendency to over report symptoms (Abed

and Abd El-Raouf, 2021).

The current study observed that students with good support systems from their family and friends had a lower chance of having moderate to high stress levels. This finding is consistent with a previous study which found that students with poor social support were 1.7 times more stressed than those who had strong social support (Nakie *et al.*, 2022). Similarly, another study in Ghana, also found that furthermore, social support has been found to be significantly and negatively associated with the levels of depression, anxiety and stress levels of students. This finding indicates that the more support students receive, the lower their reported levels of psychological distress (Kugbey *et al.*, 2021). This finding is also consistent with previous study in Nepal, which observed that parental support could promote self-esteem in children and reduce psychological distress by offering their support throughout this developmental phase. In addition, adolescence who receive high parental support has better self-esteem than those who receive low parental support (Poudel *et al.*, 2020). This finding is due to social support serving as a buffer against negative outcomes in school and associated challenges. Students with poor social support can't get opportunities like advice, guidance, encouragement, acceptance, emotional comfort, and tangible assistance such as financial help. Thus, students can't be comforted when they are faced with a wide range of life stressors, and they can be extremely stressed in their efforts to manage these challenges.

The current study found that students who live outside the campus were 3.30 times more likely to have moderate to high levels of stressed as compared to students that stay within the university environment. This finding is consistent with a previous study which observed that the prevalence of stress was noted to be higher in those students who were not accommodated on campus (73.0%) compared to those who were (33.8%) (Chabili, 2020). Similarly, another study conducted in Omaha, United States of America, found that students who live on-campus would have a higher likelihood of positive mental health outcomes (Siddiqui and Marshall, 2023). The study further observed that student who stayed within the campus reported a stronger sense of belonging and as a result, showed more positive outcomes in many school situations. However, our findings are consistent with a previous which observed that stress levels were higher among those who live on-campus with one or more roommates report a higher level of stress as compared to students who live outside campus (Horvath *et al.*, 2012).

The current study observed that environmental factors such as financial and academic pressure were associated 1.38 times increase in the levels of moderate to high stress among diploma nursing students at LMMU and the observed association had a borderline significance level. This finding is consistent with

previous studies that have shown that lack of financial resources can also indirectly lead to increased stress through poor nutrition, housing, and insurance (Jones *et al.*, 2018). Another study conducted in Zambia observed that the three common causes of increase stress among students were academic pressure (95.94%), lecturers' attitudes (72.73%) and financial worries (68.94%) (Chabili, 2020). Another study observed that there is a positive correlation between perceived academic stress and mental well-being in United States college students, suggesting that academic stressors, including academic expectations, workload and grading, and students' academic self-perceptions, are equally important as psychological well-being. Overall, irrespective of gender, race/ethnicity, or year of study, students who reported higher academic stress levels experienced diminished mental well-being (Barbayannis *et al.*, 2022).

Levels of Anxiety among Diploma Nursing Students at LMMU

The current study found that a unit increase in the age of students was associated with a decrease in the levels of moderate to high anxiety among the students and this decrease could as high as 0.95 to as low as 0.72. Our findings are consistent with a previous study which observed that age had a protective effect on the levels moderate to high anxiety among college students (Saed *et al.*, 2018). Similarly, a previous systematic review observed that younger students tend to report a higher level of stress, anxiety and depression (SAD) compared to older students (Mofatteh *et al.*, 2021). Our findings also corroborate with a study conducted in Spain and Costa Rica, which observe that the levels of anxiety decrease as age increases (Carstensen and DeLiema, 2018; Gijón Puerta *et al.*, 2022; Valiente *et al.*, 2021). Reasons for this finding are unknown, but several hypotheses have been proposed. These hypotheses include age-related changes in brain neurotransmitter function, age-related psychological and/or social changes, disorder-associated mortality, and a cohort effect. Diminished anxiety may relate to age-related reduction in attention to negative emotions. Diminished anxiety may also relate to age-related enhancement in emotion regulation. Trait anxiety diminishes with age, which may result from age-related decline in registering salient emotional stimuli and/or enhancement in emotion regulation (Chaudhary *et al.*, 2023).

The current study found that individuals with a tendency of having negative thoughts were 1.73 times to have moderate to high levels of anxiety and the observed association was statistically significant. Our findings are consistent with a previous study which observed that students' anxiety was primarily related to their negative thinking and maladaptive coping (Mahmoud *et al.*, 2015). The further observed that females have tendency of negative thinking hence experience more anxiety than men. Our findings are also corroborating with study in Brazil, which observed that students who are prone to suicidal thoughts were 1.4 times more likely to have high

levels of anxiety (Alves *et al.*, 2021). We are aware that anxiety gradually increases the rate of suicidal thoughts in individuals suffering from this disorder helping to explain the findings. Consequently, policies and initiatives need to be instigated at LMMU to address this high-rate anxiety and the potential implications.

Regarding, coping mechanism or management of stress levels, the current study found that students that had good stress management systems were less likely to have moderate to high levels of anxiety but the observed association was not statistically significant (P -value >0.05). Our findings are consistent with previous study which observed that increased anxiety levels in students is due to maladaptive coping strategies (Mahmoud *et al.*, 2015). Students who generally use maladaptive coping strategies (i.e., denial, substance use, behavioral disengagement, self-blame) to manage stress may be at increased risk of problematic behavioral and psychological outcomes, including problematic alcohol use (Metzger *et al.*, 2021).

The current study observed that environmental factors such as financial and academic pressure were associated with an increase with the levels of moderate to high anxiety among diploma nursing students at LMMU, but the observed association was not statistically significant. Our findings are similar to a previous study which observed that a financial stress is also a major contributor that both directly and indirectly affects student anxiety. Financial stress is associated with decreases in both mental and physical health, as well as increases in anxiety (Jones *et al.*, 2018). A previous study also observed that other studies have observed that number of students sometimes or often struggle to make their financial ends meet and there was a consistent pattern with more mental and somatic health problems among students who experienced financial difficulties more frequently (Bøe *et al.*, 2021). Another longitudinal study conducted in the United Kingdom (UK) observed that financial difficulties are associated with worse general mental health, and increased symptoms of anxiety and depression (McCloud and Bann, 2019).

Several studies have observed that academic pressure or stress is the major cause of anxiety among students (Jones *et al.*, 2018; Kamble and Minchekar, 2018; Zhao, 2024). Academic stress or pressure may trigger anxiety in college students, especially when coping with exams, essay writing and academic competition. Another study observed that there is a significant positive correlation between academic stress or pressure and anxiety, indicating that the greater the individual's academic stress or pressure, the higher the level of anxiety (Zhao, 2024). Anxiety is a normal bodily reaction when an individual is faced especially among students and the appropriate amount of academic stress can also improve an individual's ability to deal with things, but if an individual is consistently in an academically stressful environment and feels that he or

she is unable to deal with events that may occur in the future, his or her anxiety level is likely to rise. It can even trigger anxiety disorders (Kamble and Minchekar, 2018; Zhao, 2024). Several explanations of this phenomenon are plausible. First, the strength of this link could be best understood as the result of increased pressure on college students to perform well academically, given that academic performance is pertinent to future careers and employment status. Second, with greater competition and higher numbers of college graduates, it is plausible that academic distress is overwhelming for many students, leading to increases in anxiety. Finally, it is plausible that increases in anxiety may affect students' academic distress more severely than their perception of support or level of financial stress. In other words, students' anxiety may frequently take the form of academic concerns.

Levels of Depression among Diploma Nursing Students at LMMU

The current study found that increasing age and being female was associated with a decrease in the levels of moderate to high depression among diploma nursing students. However, the observed association was not statistically significant. Our findings are consistent with other studies which interestingly found that females were at lower risk of depression compared to their male counterparts (Gao *et al.*, 2022; Song *et al.*, 2020). Our findings are not in line with previous studies that found that female students were 1.3 times more likely to develop depression as compared with male students (Adhikari *et al.*, 2017; Nakie *et al.*, 2022). Similarly, other studies done in Ghana, Chandigarh India, and Malaysia among high school students also found that females high school students were more stressed than males (Kugbey *et al.*, 2021; Wahab *et al.*, 2020). Due to the influence of traditional ideas, young males are burdened with excessive expectations while they avoid talking about negative emotions, which explains the higher percentage of male students suffering from depression than the females at the same educational level (Swetlitz, 2021). Too many men who suffer from depression remain undiagnosed. While men are diagnosed with depression at half the rate of women, they die by suicide 3 to 4 times as frequently.

The study observed that students who had a tendency to have negative thoughts were more likely to have moderate to high levels of depression. These findings are consistent with previous study that observed that neuroticism was positively associated with the onset and magnitude of fluctuation of depressive symptoms (Song *et al.*, 2020). Similarly, other studies

have shown that repetitive negative thinking (RNT) is a common symptom of depression and anxiety disorders and has been linked with deficits in cognitive, behavioral, and affective functioning (Kertz *et al.*, 2015). Furthermore, RNT is a significant predictor of mental health problems in university students (Inostroza *et al.*,

2024). Individuals with high level of neuroticism tend to have negative thoughts in response to setbacks due to their cognitive model, thus having a greater risk of depression.

The current study found that students who stayed outside the school were 2.46 times more depressed than students who stayed with campus and the observed association was statistically significant. Our findings are not consistent with other studies which found that students who lived in a hall or mess have more depression compared to the students who live with their family members at home (Hossain *et al.*, 2022). However, our findings are consistent with a previous study which found that students who stayed within campus were less likely to have depression as compared with students coming from home (Abdallah and Gabr, 2014). Similarly, another study conducted in Kenya found that students who lived off campus had a higher level of moderate to high depression compared to students living the school environment (Othieno *et al.*, 2014). Another study in Malaysia observed that students who stayed outside campus had 1.63 times (95% CI: 1.08-2.45) higher risk for depression than students staying on campus (Islam *et al.*, 2018). Off-campus students may experience more depression than on-campus students due to financial pressures, social isolation, and a lack of community support.

The current study found that students with good support systems from their family and friends were less likely to moderately or highly depressed as compared to students with poor support systems. Our findings are consistent with a previous study which found that family support and satisfaction are key factors that influence university students (Dawood *et al.*, 2017). Another study observed that an active family support functions as a defense against psychiatric morbidity among nursing students. Separation of parents can lead to a shrinkage of family support and become an influencing factor of stress that can cause depression in nursing students (Islam *et al.*, 2018).

Limitation of the Study

- i. There is need to conduct longitudinal research to identify the cause-and-effect relationship between depression, anxiety, and stress with different factors.
- ii. An interventional study can be conducted to reduce the levels of Depression, Anxiety & Stress among Nursing students
- iii. some questions assessed history, which is subject to recall bias.
- iv. the findings of this study may not be generalized as the results are based upon diploma nursing students at LMMU.
- v. This study was limited to Diploma Nursing students enrolled in selected under nursing school not in selected institutions therefore this may not be the representative of other training institutions of learning for Nursing.

CONCLUSION

Depression, anxiety and stress are highly prevalent among diploma nursing students and correlations between these variables are positive. The improvement of mental health services among nursing students is essential. The findings call for initiation of mental health screenings sessions for nursing students, training on stress management interventions and increased counselling facilities/opportunities for nursing students in the university and indeed the entire student population of the institution. To support their mental well-being, it's recommended to implement counselling services, mental health screenings, and demands concerted and a collaborative effort from schools, parents, policymakers, and society at large. Recognizing regional dynamics and implementing tailored interventions, we can mitigate the impact of depression, anxiety, and stress.:

RECOMMENDATION

The study makes the following recommendations;

- i. There is need of extending mental health services to all universities, and strengthening the existing counseling services are recommended so that early detection of depression, anxiety, and stress can be done.
- ii. There is need to conduct longitudinal research to identify the cause-and-effect relationship between depression, anxiety, and stress with different factors.
- iii. An interventional study can be conducted to reduce the levels of Depression, Anxiety & Stress among Nursing students.
- iv. A similar study can be replicated among all students in others University.

Implications of the Findings to Nursing Importance of Research

Understanding mental health challenges experienced by diploma nursing students at Levy Mwanawasa Medical University is critical for fostering their overall well-being and academic success. Mental health is a foundational component of student life that directly impacts various domains, including academic performance, emotional stability, and professional development. By investigating the prevalence and contributing factors of stress, anxiety, and depression, researchers can identify the scope of these issues and develop evidence-based solutions. This research serves as a vital tool not only for academic institutions but also for individual students and the broader healthcare community. Addressing mental health issues preemptively can lead to improved retention rates, academic achievements, and long-term career satisfaction among nursing students.

Significance for Academic Performance

Mental health issues can serve as significant barriers to academic performance among nursing

students. Psychological distress, including stress, anxiety, and depressive symptoms, often manifests in cognitive impairment, decreased motivation, and poorer concentration, all of which can adversely affect learning outcomes. Understanding these relationships allows educators and administrators to develop tailored interventions aimed at enhancing academic resilience. By identifying students who are struggling and implementing proactive measures, such as stress-reduction workshops and academic support, educational institutions can actively contribute to improved scholastic performance and enhance students' overall educational experiences.

Development of Resilience

Fostering resilient mental health in nursing students is essential for several reasons. First and foremost, resilient students are better equipped to provide high-quality patient care. As future healthcare professionals, nursing students must develop the psychological fortitude to navigate the challenges inherent in clinical practice, which often involves exposure to high-stress situations and emotionally charged environments. Additionally, nurturing resilience among students is vital for preventing burnout, an increasingly common phenomenon in the nursing profession. Burnout can lead to high turnover rates, reduced quality of patient care, and significant mental health implications for practitioners. By implementing programs focused on resilience development, universities can ensure that nursing graduates enter the workforce prepared to manage stress effectively and contribute to a healthier work environment.

Commitment to Student Welfare

Levy Mwanawasa Medical University's commitment to prioritizing student mental health illustrates its recognition of the integral relationship between well-being and academic success. This commitment manifests in the form of supportive learning environments that promote psychological health and facilitate open discussions about mental health issues. Implementing targeted interventions informed by research findings is a strategic approach that aligns with the university's mission to foster a holistic educational experience. By investing in mental health initiatives, the university not only enhances student welfare but also cultivates a culture of care and empathy within its academic community.

Policy and Support Services

Insights gleaned from research on mental health challenges can significantly influence policy development and the enhancement of support services within the nursing education framework. A comprehensive understanding of the unique needs and experiences of nursing students can guide efforts to create an inclusive and effective educational environment. This entails the development of policies that prioritize mental health resources, including access

to counselling services, peer support programs, and academic accommodations. Additionally, engaging stakeholders in the nursing education ecosystem can facilitate collaborative policy-making that addresses systemic issues contributing to student stress and anxiety.

Curriculum Development

Incorporating mental health education and coping strategies into the nursing curriculum is essential for preparing students to face the emotional and psychological demands of their profession. By integrating these topics into core nursing courses, students can learn about mental health awareness, self-care practices, and techniques for managing stress and anxiety. This approach not only equips students with the knowledge necessary for their personal well-being but also prepares them to support their future patients' mental health needs. Curricular innovations may include mandatory workshops on psychological resilience, case studies exploring mental health scenarios, and opportunities for experiential learning that reinforce the importance of mental health care.

Enhanced Support Services

Establishing robust counselling and mental health support systems at the university is imperative for providing accessible resources to students. These services should be comprehensive, offering individual counselling, group therapy, workshops on stress management, and educational resources about mental health. Additionally, raising awareness of these services through outreach programs and peer education can encourage students to seek help when needed. Support services should also encompass crisis intervention protocols to address acute mental health emergencies, thereby ensuring a proactive approach to student welfare.

Training for Faculty

Equipping faculty members with the skills to recognize and address mental health issues among nursing students is crucial for fostering a supportive educational environment. Training programs should focus on best practices for identifying signs of mental distress, engaging in empathetic conversations, and directing students to appropriate resources. By facilitating a culture of openness regarding mental health, faculty can play an instrumental role in promoting student well-being. Ongoing professional development opportunities related to mental health awareness can further enhance educators' abilities to support their students effectively.

Resilience-Building Programs

Implementing resilience-building programs is a strategic priority for preparing nursing students to handle the emotional demands of their future careers. These programs should encompass evidence-based techniques such as mindfulness, cognitive-behavioural skills, and stress coping strategies. Workshops, retreats, and

mentorship opportunities can provide students with practical tools to enhance their resilience. Additionally, fostering a sense of community and peer support can bolster students' emotional fortitude, leading to improved mental health outcomes.

Research and Continuous Improvement

Encouraging ongoing research into the mental health of nursing students is vital for the continuous improvement of interventions and policies. By establishing a research framework that prioritizes data collection and analysis, the university can monitor trends in student mental health and assess the effectiveness of implemented strategies. Collaborative research efforts with external institutions may enhance the knowledge base in this area, contributing to broader discussions about mental health in nursing education. Establishing feedback mechanisms that allow students to share their experiences and suggestions can also sustain a cycle of improvement, ultimately benefiting future cohorts of nursing students.

Plans for Dissemination of Findings

Bound copies of the research findings were made available in the Main and Medical Libraries, as well as in the School of Nursing Sciences and the Ministry of Health (MoH). Additionally, the findings will be published in both local and internationally recognized journals to ensure wide dissemination and accessibility to a broader audience. Furthermore, seminars, workshops, and conferences will be organized at the research site to facilitate in-depth discussions regarding the findings and their implications for practice and policy.

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