

## Original Research Article

# Psychological distress among pharmacy students in Ghana and its impact on academic performance

Harry A. Okyere<sup>1</sup>, Victor C. Wutor<sup>2,3\*</sup>

<sup>1</sup>Pharmaceutical Society of Ghana, Accra, Ghana

<sup>2</sup>Department of Biotechnology, Microbiology and Public Health, AEServe, Lethbridge, Alberta, Canada

<sup>3</sup>Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, 2-35 Medical Sciences Building, Edmonton, Alberta, Canada

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### \*Correspondence:

Victor C. Wutor,

E-mail: [wutor@ualberta.ca](mailto:wutor@ualberta.ca)

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## ABSTRACT

**Background:** Mental health encompasses emotional, psychological, and social well-being, shaping cognition, behaviour, and interpersonal relationships across the lifespan. There is a high level of stress, anxiety and depression among students of professional programs such as pharmacy. Academic distress is expected to be associated with high general anxiety.

**Methods:** The study employed a quantitative cross-sectional design and used the depression, anxiety, and stress scale (DASS-21) to measure psychological distress and self-reported grade point average (GPA) for academic performance. A sample of 482 pharmacy students from three pharmacy institutions completed the online survey between April and July 2024.

**Results:** Out of 497 participants, 482 completed the study, yielding a 97% completion rate. Of these, 50.6% were female (n=244) and 49.4% male (n=238). Most students (46.9%) were aged 21-24, about a quarter below 21 years, while the fewest were 30 or older. The majority were Christians (86.3%), followed by Muslims (12%), with a small proportion from other faiths. About 80% (n=386) of respondents reported symptoms of depression, anxiety and stress. Both males and females showed similar levels of anxiety and depression. However, females had a 37% higher likelihood of reporting stress than their male counterparts (OR=0.73, p=0.002).

**Conclusions:** This study revealed a high prevalence of anxiety, depression, and stress among pharmacy students in Ghana, with female students particularly prone to stress. While anxiety and depression correlate positively with higher academic performance, stress shows a negative impact.

**Keywords:** Anxiety, Depression, Ghana, Pharmacists, Stress, Students

## INTRODUCTION

The World Health Organization (WHO) defines mental health as a state of well-being in which individuals recognize their abilities, manage daily stressors effectively, engage in productive work, and contribute meaningfully to society.<sup>1</sup> Mental health encompasses emotional, psychological, and social well-being, shaping cognition, behaviour, and interpersonal relationships across the lifespan. Despite its critical role in overall

health, mental health remains under-prioritized in Ghana, where an estimated 10% of the population experiences common mental health disorders, with 1-3% exhibiting severe conditions. The mental health treatment gap is estimated to be between 95% and 98%, exacerbated by inadequate training for healthcare professionals.<sup>2,3</sup> Like other healthcare trainees, pharmacy students face significant academic and professional pressures that can impact their mental well-being. Studies indicate a high prevalence of anxiety and depressive disorders among

pharmacy students, with academic stress, workload, and familial expectations as major contributing factors.<sup>4,5</sup>

Depression, characterized by persistent sadness, loss of interest, and functional impairment, arises from genetic, environmental, and psychological factors, including stress, trauma, and socio-economic challenges.<sup>6-8</sup> Anxiety disorders, including panic attacks and obsessive-compulsive disorder, similarly disrupt daily functioning and are prevalent even in seemingly stable individuals.<sup>8,9</sup> Among healthcare professionals and students, exposure to trauma, high-stakes decision-making, and moral injury further increases vulnerability to psychological distress.<sup>10,11</sup>

Globally, research highlights significant psychological distress among pharmacy students, with stress levels often heightened among female students due to socio-environmental factors.<sup>12-15</sup> However, existing studies predominantly focus on contexts outside Ghana and the West African subregion, limiting their applicability to local pharmacy students, whose experiences are shaped by distinct socio-cultural and economic conditions. The Doctor of Pharmacy (PharmD) program in Ghana is academically rigorous, placing considerable demands on students, who must balance coursework, professional training, and societal expectations. Understanding the psychological distress experienced by pharmacy students in Ghana is essential for designing targeted interventions that promote academic success, personal well-being, and professional resilience.

Aim was to investigate the prevalence of psychological distress among pharmacy students in Ghana and its impact on their academic performance.

## METHODS

### Design

This study employed a quantitative cross-sectional design and used the depression, anxiety, and stress scale (DASS-21) to measure psychological distress and self-reported grade point average (GPA) for academic performance. A sample of 482 pharmacy students from three institutions, the University of Ghana School of Pharmacy, Central University School of Pharmacy, and the Kwame Nkrumah University of Science and Technology Faculty of Pharmacy, completed the online survey between April and July 2024. The eligibility criteria specified that only pharmacy students enrolled at the mentioned academic institutions could participate. Responses from participants who completed the entire survey in less than 1/3 of the median survey length were excluded from the analysis.

### Data collection

This study used internet platforms to perform an anonymous cross-sectional electronic survey. Emails,

groups from student organizations, and social media messaging systems like WhatsApp were used to disseminate a link to the poll. The questions generated data on demographic characteristics such as age, gender, religion, and grade point average (GPA). The DASS-21 was used to gather data on the participants' emotional states of depression, anxiety, and stress (Lovibond and Lovibond, 1995). The questionnaire was kept as brief as feasible to reduce the risk of high drop-out rates.

### Quality control

The survey settings were set to reject multiple responses from the same IP address to prevent multiple submissions. The survey was optimized for all mobile, tablet, and computer device types, so participants did not need to zoom in and out to answer questions due to poor rendering. The questionnaire was pretested to ensure that participants would understand the language.

### Ethical considerations

Ethical considerations in this study included informed consent, anonymity, and confidentiality. The protocol was approved by the Noguchi Memorial Institute for Medical Research's Institutional Review Board (NMIMR-IRB #043/21-22). The online data collection instrument included Participant Information sheets that informed participants of the study's purpose, assured confidentiality, and gave the option to withdraw. Consent forms were signed voluntarily. To protect identities, no personal identifiers were collected. Data was securely stored and password protected.

### Data analysis

Data analysis was done with SPSS version 25. Categorical variables were reported as percentages of other variables. To determine the prevalence of anxiety, stress and depression, DASS-21 questionnaires were used to score the level of severity of pharmacy students' anxiety, depression and stress levels, and the percentage was used for the prevalence. The multivariate regression analysis was used to measure the factors contributing to the various mental health issues, and the odds ratio was used to examine the risk of association. The Kruskal-Wallis test determined associations between DASS components and self-reported academic performance.

## RESULTS

Out of 497 participants, 482 completed the study, yielding a 97% completion rate. Of these, 50.6% were female (n=244) and 49.4% male (n=238). Most students (46.9%) were aged 21-24, about a quarter below 21 years, while the fewest were 30 or older. The majority were Christians (86.3%), followed by Muslims (12%), with a small proportion from other faiths.

**Table 1: Characteristics of study participants.**

Characteristics	Categories	Frequency	Percentage
Sex	Female	244	50.6
	Male	238	49.4
Age (years)	20 and below	178	37.1
	21-24	225	46.9
	25-30	57	11.9
	Above 30	20	4.2
Religion	Christianity	416	86.3
	Islam	58	12.0
	Other	8	1.7
University	CU	186	38.6
	KNUST	164	34.0
	UG	132	27.4
Level	Year 1	111	23.0
	Year 2	86	17.8
	Year 3	69	14.3
	Year 4	91	18.9
	Year 5	85	17.6
	Year 6	40	8.3
GPA	1.99-1.50	9	1.9
	2.99-2.0	140	29.0
	3.59-3.0	222	46.1
	4.0-3.60	109	22.6
	Below 1.49	2	0.4

**Table 2: Relationship between depression, anxiety and stress (DAS) levels.**

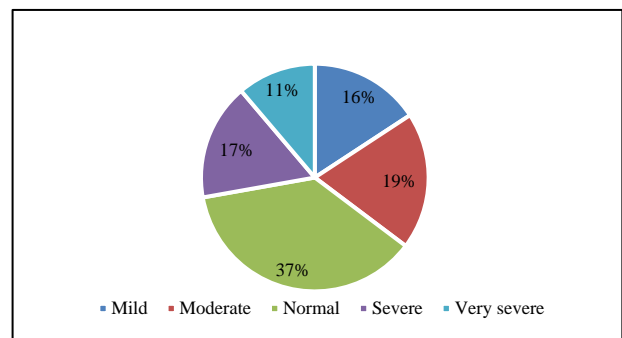
			Anxiety	Depression	Stress
Spearman's rho	Anxiety	Correlation Coefficient	1.000		
		Sig. (2-tailed)	.		
		N	482		
	Depression	Correlation Coefficient	0.604**	1.000	
		Sig. (2-tailed)	0.000	.	
		N	482	482	
	Stress	Correlation Coefficient	0.509**	0.637**	1.000
		Sig. (2-tailed)	0.000	0.000	.
		N	482	482	482

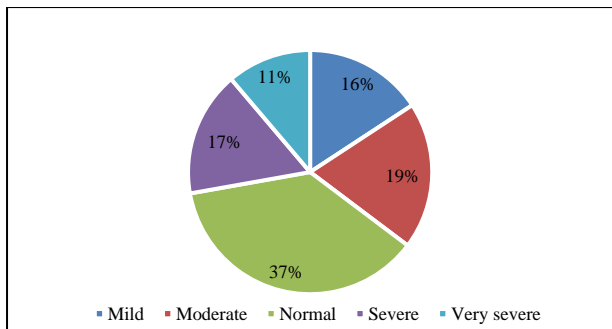
**Prevalence of depression, anxiety and stress**

About 80% (n=386) of respondents reported symptoms of depression, anxiety and stress. Both males and females showed similar levels of anxiety and depression. However, females had a 37% higher likelihood of reporting stress than their male counterparts (OR=0.73, p=0.002).

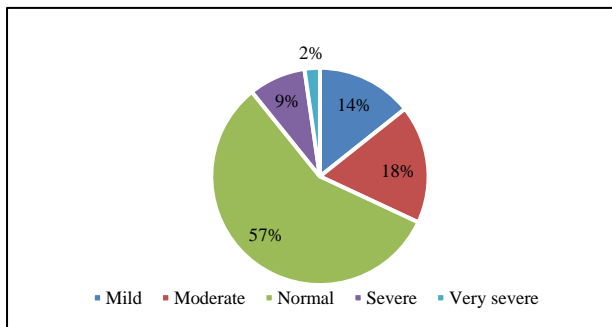
Table 2 demonstrates significant positive correlations between anxiety, depression, and stress. The Spearman's rho analysis indicates a moderate association between anxiety and depression ( $r=0.604$ ,  $p<0.001$ ) and between anxiety and stress ( $r=0.509$ ,  $p<0.001$ ). At the same time, a stronger correlation was observed between stress and depression ( $r=0.637$ ,  $p<0.001$ ). These findings suggest that increased levels of stress and anxiety are closely linked to

higher levels of depression, with all associations being statistically significant.

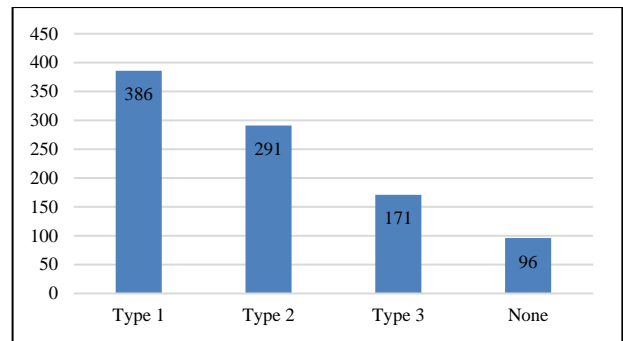
**Figure 1: Levels of anxiety.**



**Figure 2: Levels of depression.**



**Figure 3: Levels of stress.**



**Figure 4: Psychological distress types (type 1 = anxiety or depression or stress, type 2 = anxiety and depression or anxiety and stress or depression and anxiety, type 3 = anxiety, depression and stress).**

The results show that both depression and anxiety have a positive and statistically significant impact on academic performance, while stress has a negative but statistically insignificant impact on academic performance. This means that students who felt more anxious and depressed tended to do better in school, while those who felt more stressed often did worse.

**Table 3: Impact of depression, anxiety and stress on academic performance.**

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
1	Anxiety	0.677	0.065	0.553	10.373	0.000
	Depression	0.387	0.090	0.261	4.282	0.000
	Stress	-0.064	0.107	-0.030	-0.601	0.548

a. Dependent variable: academic performance

## DISCUSSION

This study highlighted the high prevalence of psychological distress among pharmacy students in Ghana, with anxiety being the most common, followed by depression and stress. The findings align with previous studies documenting similar mental health challenges among pharmacy and medical students globally.<sup>12,16,17</sup>

The demanding nature of the PharmD program, academic pressures, and future career expectations will likely contribute to these elevated levels of distress.<sup>18,19</sup> Many students struggle to relax, experiencing heightened nervous energy, fear, and worry about their academic journey, which may lead to overreactions to challenges and an increased risk of mental health concerns.

A quarter of the participants suffered from very severe anxiety (Figure 1). Approximately one out of every participant had severe depression (Figure 2). Figure 3 shows that fifty-seven percent of the participants showed

no signs of stress. Type 1 psychological distress was very prominent among the students (Figure 4).

The study further found that female pharmacy students were more likely to experience anxiety, depression, and stress compared to their male counterparts. This is consistent with existing literature, which suggests that female students often report higher levels of psychological distress due to socio-cultural expectations, workload pressures, and emotional predispositions.<sup>5</sup>

A key finding of this study is the relationship between psychological distress and academic performance. While stress was negatively correlated with academic success, anxiety and depression were paradoxically associated with higher academic performance. This may suggest that moderate levels of anxiety and depressive symptoms serve as motivators, pushing students to meet academic demands, whereas excessive stress hinders performance. This aligns with the Yerkes-Dodson law, which suggests

that optimal performance occurs at moderate stress levels, but excessive stress impairs functioning.<sup>5</sup>

The positive correlations observed between anxiety, depression, and stress among pharmacy students stress the complex interplay of these psychological states. The stronger association between stress and depression ( $r=0.637$ ,  $p<0.001$ ) compared to anxiety and stress ( $r=0.509$ ,  $p<0.001$ ) suggests that chronic stress may serve as a key precursor to depressive symptoms, potentially exacerbating feelings of helplessness and emotional exhaustion. These findings align with prior studies indicating that persistent academic stress can contribute to increased vulnerability to depression and anxiety among healthcare students.<sup>5,18</sup> The moderate correlation between anxiety and depression ( $r=0.604$ ,  $p<0.001$ ) further highlights the co-occurrence of these conditions, as anxiety-related cognitive distortions may heighten the risk of depressive symptoms. Given that psychological distress can impair concentration, decision-making, and overall well-being, these findings emphasize the need for targeted mental health interventions within pharmacy education programs. Providing stress management resources and counselling services could mitigate the adverse effects of mental distress and improve students' academic and professional outcomes.<sup>12</sup>

These findings highlight the urgent need for targeted psychological health interventions tailored to pharmacy students in Ghana. Institutions must develop proactive strategies to support students' well-being, including counselling services, stress management programs, and academic mentorship. Addressing psychological distress in pharmacy education is critical for students' academic success, long-term professional competence, and ability to provide quality patient care.

There are few limitations. Participation bias could skew the results and make it difficult to generalize the findings to the general population. Also, the oversimplification of the outcome by reducing it to numbers without considering the nuanced aspects may affect the results. This is a snapshot and does not represent the overall condition of the participants.

## CONCLUSION

This study revealed a high prevalence of anxiety, depression, and stress among pharmacy students in Ghana, with female students particularly prone to stress. While anxiety and depression correlate positively with higher academic performance, stress shows a negative impact. The findings highlight the necessity for targeted mental health interventions to support students' well-being and academic success.

Notably, while anxiety and depression were positively associated with academic performance, stress had a negative but statistically insignificant impact. These findings suggest moderate psychological distress may

motivate academic achievement, whereas excessive stress hinders performance.

Given pharmacy students' critical role as future healthcare providers, addressing their psychological and mental health challenges is imperative. Institutions must implement targeted interventions, such as mental health education, counselling services, and academic support systems, to mitigate psychological distress and promote student well-being. Future research should explore longitudinal trends in mental health among pharmacy students and assess the effectiveness of tailored interventions in improving academic performance and overall mental well-being.

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