

Prevalence of Stress, Anxiety, Depression Among Pharmacy Students and Their Association with Academic Performance and Living Conditions

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Abstract

Background: Psychological distress, including stress, anxiety, and depression, is highly prevalent among university students, particularly those in healthcare disciplines such as pharmacy. Academic demands and lifestyle factors may contribute significantly to students' mental health.

Objective: This study aimed to assess the prevalence of stress, anxiety, and depression among pharmacy students and to examine their association with academic level, academic performance, and lifestyle factors such as sleep duration and caffeine consumption.

Methods: A cross-sectional study was conducted among 200 pharmacy students at Al-Nahrain University, Iraq. Psychological distress was assessed using the Depression Anxiety Stress Scale-21 (DASS-21). Data on demographic, academic, and lifestyle variables were collected. Statistical analysis was performed using non-parametric tests and multiple linear regression to identify significant predictors.

Results: A high prevalence of psychological distress was observed among students. Female students reported significantly higher stress ($p = 0.045$) and anxiety ($p = 0.032$) scores compared to males, while no significant difference was observed in depression. Academic level was significantly associated with psychological distress, with students in higher academic years demonstrating higher scores. Multiple linear regression analysis showed that academic level was a consistent predictor for total DASS and anxiety, while gender was associated with stress and anxiety. Academic grade (level 3) was significantly associated with lower depression scores ($p = 0.024$). Sleep duration and caffeine consumption were not significant predictors. Overall, regression models showed low explanatory power ($R^2 < 10\%$).

Conclusion: Psychological distress among pharmacy students is influenced by academic level and gender, while lifestyle factors showed limited predictive value. These findings highlight the need for targeted mental health interventions and academic support programs to improve student well-being.

Keywords

Psychological distress, Stress, Anxiety, Depression, Pharmacy students, Academic level, Sleep duration, Caffeine consumption, DASS-21, Mental health

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INTRODUCTION

Psychological distress, including stress, anxiety, and depression, represents a major public health concern among university students worldwide [1,2]. Healthcare students, particularly pharmacy students, are exposed to intensive academic demands, clinical responsibilities, and high expectations, which place them at increased risk of mental health problems [3,4].

Previous studies have consistently reported a high prevalence of stress, anxiety, and depression among pharmacy students, with significant

negative effects on academic performance, cognitive function, and overall well-being [5,6]. Academic stress has been shown to impair attention, working memory, and problem-solving abilities, while depressive symptoms are associated with reduced motivation and academic achievement [7,8].

In addition to academic factors, lifestyle-related variables such as sleep quality and caffeine consumption play a critical role in shaping psychological health. Poor sleep has been strongly

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associated with increased levels of stress, anxiety, and depression [9], whereas excessive caffeine intake may exacerbate anxiety and disrupt sleep patterns, creating a negative cycle that further impacts mental health [10].

Despite the growing body of literature, limited data are available regarding the combined influence of academic level, lifestyle factors, and academic performance on psychological distress among pharmacy students in Iraq. Therefore, this study aims to assess the prevalence of stress, anxiety, and depression and to examine their association with academic performance and lifestyle-related factors.

Aim of the study

This study aims to assess the prevalence of stress, anxiety and depression among pharmacy students and to examine their association with academic performance and living conditions.

Hypotheses

Based on previous literature, the following hypotheses were proposed:

- **H1:** Higher academic level is associated with increased stress, anxiety, and depression.
- **H2:** Poor sleep duration is associated with higher levels of psychological distress.
- **H3:** Higher caffeine consumption is associated with increased anxiety and stress levels.
- **H4:** Psychological distress is negatively associated with academic performance.

SUBJECTS AND METHODS

Study design and settings

This study was conducted as a cross-sectional study in Al-Nahrain University, Collage of Pharmacy, Baghdad, Iraq . Data collection was done from 1 September 2025 to 28 February 2026.

Subjects:

The study included 200 pharmacy students from Al-Nahrain University. Stress, anxiety, and depression were assessed at a single time point using the DASS scale. Participants were

categorized into groups according to gender, academic year, annual academic grade, weekly study hours, caffeine intake, and part-time job status. Associations between DASS scores and academic/performance-related and lifestyle variables were examined (10).

Ethical Consideration:

The study was approved by the Ethics Committee of the College of Pharmacy, Al-Nahrain University. Written informed consent was obtained from all individual participants included in the study.

Sample size calculation:

The sample size was calculated using Cochran's formula for estimating prevalence at a 95% confidence level ($Z = 1.96$), assuming a 50% expected proportion and a 5% margin of error. Considering the total population of pharmacy students at Al-Nahrain University ($N = 590$), finite population correction was applied, yielding a required sample size of approximately 233 students. A total of 200 students were included in the study, providing an acceptable margin of error of approximately 5.6%.

Data Collection Tool

Psychological distress was assessed using the validated Depression Anxiety Stress Scale-21 (DASS-21), which measures three domains: stress, anxiety, and depression. Each domain consists of seven items scored on a 4-point Likert scale.

Participants also provided demographic and lifestyle information, including gender, academic year, academic performance (annual grade), sleep duration, weekly study hours, caffeine consumption, and part-time employment status.

Statistical Analysis

Data were analyzed using JASP. Descriptive statistics were used to summarize participant characteristics. Continuous variables were presented as mean \pm standard deviation (SD), while categorical variables were expressed as frequencies and percentages.

The normality of continuous variables was assessed using the Shapiro-Wilk test. Differences in DASS scores (stress, anxiety, and depression)

between two groups (e.g., gender and part-time job status) were analyzed using the independent samples t-test for normally distributed data, or the Mann-Whitney U test for non-normally distributed data. Comparisons among more than two groups (academic year, academic grade categories, weekly study hours, and caffeine intake levels) were performed using one-way ANOVA or Kruskal-Wallis test, as appropriate.

Chi-square test was used to examine associations between categorical variables. Correlation analysis was performed using Pearson's or

Spearman's correlation coefficients depending on data distribution. A p-value < 0.05 was considered statistically significant.

RESULTS

Descriptive Characteristics

A total of 200 pharmacy students were included in the analysis. The majority of participants were female (74.5%), and most students were in advanced academic years, particularly the fifth year (52%), followed by the fourth year (38.5%).

Table 1. Demographic characteristics of participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	51	25.5
	Female	149	74.5
Academic Year	Year 5	104	52
	Year 4	67	38.5
	Year 3	22	11
	Year 1+2	7	3.5
Part-time Job	Yes	35	17.5
	No	165	82.5

Regarding lifestyle factors, the majority of students (82.5%) reported not having part-time employment. Sleep duration was categorized into four groups, with a substantial proportion of students reporting inadequate sleep. Specifically,

39.5% of students reported sleeping less than 6 hours per night, while only a minority achieved the recommended sleep duration of 7–8 hours or more.

Table 2. Sleep Duration Among Students

Sleep Category	Frequency (n)	Percentage (%)
< 6 hours	79	39.5
6–6.9 hours	60	30
7–7.9 hours	34	17
≥ 8 hours	27	13.5

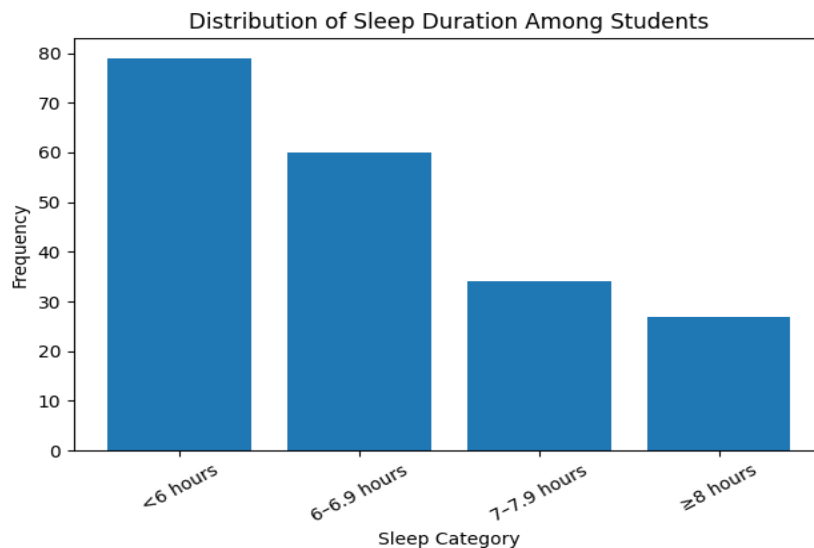


Figure 1: Distribution of sleep duration among pharmacy students

In terms of caffeine consumption, 42.5% of students reported no caffeine intake, 35.5%

consumed one cup per day, and 22% consumed two cups per day.

Table 3. Caffeine consumption

Cups per day	Frequency (n)	Percentage (%)
0	85	42.5
1	71	35.5
2	44	22

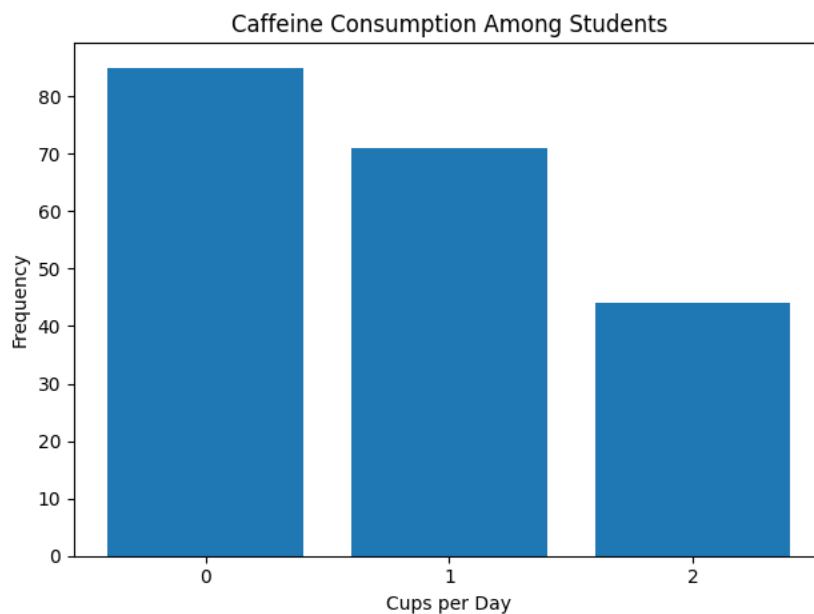


Figure 2: Distribution of Caffeine Consumption among pharmacy students

Normality Assessment

The Shapiro Wilk test indicated that all continuous variables significantly deviated from normal distribution ($p < 0.001$). Therefore, non-parametric statistical tests were applied for subsequent analyses.

Differences in Psychological Distress by Gender

A Mann-Whitney U test was conducted to assess gender differences in psychological distress.

No statistically significant difference was observed in total DASS scores between male and female students ($p = 0.080$). However, significant differences were identified in specific subscales. Female students demonstrated significantly higher stress ($p = 0.045$) and anxiety scores ($p = 0.032$) compared to male students, while no significant difference was observed in depression scores ($p = 0.923$).

Association Between Academic Level and Psychological Distress

Significant differences in psychological distress were observed across academic levels ($p < 0.05$). Students in higher academic years reported significantly higher levels of stress, anxiety, and total DASS scores compared to students in earlier years.

Multiple Linear Regression Analysis

Multiple linear regression analysis was performed to identify predictors of psychological distress,

including total DASS scores and subscale scores (stress, anxiety, and depression).

Total DASS

The overall regression model was not statistically significant ($F = 1.36$, $p = 0.181$), explaining approximately 8.7% of the variance ($R^2 = 0.087$). However, academic level was identified as a significant predictor, with students in higher academic years demonstrating higher total DASS scores.

Anxiety

The regression model approached statistical significance ($F = 1.57$, $p = 0.098$; $R^2 = 0.099$). Significant predictors included gender ($p = 0.049$) and academic level, with students in advanced years showing higher anxiety scores.

Depression

The regression model was not statistically significant ($F = 1.07$, $p = 0.384$; $R^2 = 0.070$). Academic performance showed a significant negative association with depression scores ($p = 0.024$), indicating lower depression levels among students with better academic performance.

Stress

The regression model approached statistical significance ($F = 1.59$, $p = 0.092$; $R^2 = 0.100$). Gender and academic level were identified as significant predictors, with higher stress levels observed among female students and those in higher academic years.

Table 4. Summary of Multiple Linear Regression Analysis

Outcome	R ²	p-value
Total	0.087	0.181
Stress	0.100	0.092
Anxiety	0.099	0.098
Depression	0.070	0.384

The significant predictors identified from multiple regression analyses are summarized in Table 4. Academic level was the most consistent predictor across models, particularly for anxiety and total

DASS scores. Gender was associated with stress and anxiety, while academic grade showed a significant association with depression.

Summary of Key Findings

Overall, academic level emerged as the most consistent factor associated with psychological distress. Gender was significantly associated with stress and anxiety, while academic performance showed a relationship with depression. Lifestyle factors such as sleep duration and caffeine consumption were not identified as significant predictors in regression models, despite notable patterns in descriptive analysis.

DISCUSSION

The present study investigated the prevalence and determinants of psychological distress among pharmacy students, with a particular focus on academic and lifestyle-related factors. The findings demonstrated that academic level was a significant factor influencing psychological distress, with higher levels observed among students in advanced academic years. This may be explained by increased academic workload, clinical responsibilities, and concerns about future career prospects [3,5].

These findings are partially consistent with previous studies conducted among healthcare students, which reported increased stress levels in senior academic years due to higher academic demands and clinical exposure [11]. However, other studies have reported higher stress levels among junior students, suggesting that coping mechanisms and adaptation to academic environments may vary across populations [12].

Gender differences were observed, with female students reporting higher levels of stress and anxiety compared to males. Although the overall difference in total scores was not statistically significant, significant differences were identified in specific subscales. This suggests that gender may influence certain dimensions of psychological distress rather than overall mental health status. Similar findings have been reported in previous studies, where female students exhibited higher vulnerability to anxiety and stress-related symptoms [12,13].

The regression analysis showed that the overall model had limited explanatory power, with low R^2

values. Although some variables were identified as significant predictors in specific models, most variables were not statistically significant. This may indicate that psychological distress is influenced by multiple interacting factors that were not fully captured in the current model, including social support, financial stress, and coping strategies [14].

Sleep deprivation emerged as a critical concern in this study. A substantial proportion of students reported extremely short sleep durations, which is considerably lower than recommended levels. Poor sleep is well known to impair cognitive performance, emotional regulation, and mental health. Previous studies have consistently demonstrated a strong association between inadequate sleep and increased levels of stress, anxiety, and depression [9,15].

In contrast, caffeine consumption was relatively low compared to findings from other studies, where students frequently rely on caffeine to cope with academic demands. This discrepancy may be attributed to cultural differences, lifestyle habits, or variations in academic environments [10,16].

Overall, the findings suggest that psychological distress among pharmacy students is a multifactorial issue influenced by academic pressure, gender differences, and lifestyle behaviors. The limited predictive power of the regression models highlights the need for future studies to incorporate additional psychosocial variables to better understand the complexity of mental health among students.

CONCLUSION

In conclusion, this study highlights a high prevalence of psychological distress among pharmacy students, with stress, anxiety, and depression being influenced by multiple academic and lifestyle-related factors. Academic level emerged as a key determinant, with students in advanced years experiencing higher levels of psychological burden. Gender differences were also observed, particularly in stress and anxiety dimensions.

Although lifestyle factors such as sleep duration and caffeine consumption were not identified as significant predictors in the regression models, the descriptive findings suggest that poor sleep patterns remain a critical concern among students and may contribute to psychological distress.

The relatively low explanatory power of the regression models indicates that psychological distress is a complex and multifactorial phenomenon that cannot be explained by the studied variables alone. Therefore, additional psychosocial and environmental factors should be considered in future research.

Overall, these findings emphasize the need for targeted mental health interventions, improved academic support systems, and increased awareness of healthy lifestyle practices to enhance students' well-being and academic performance.

LIMITATION

Despite the valuable insights provided by this study, several limitations should be acknowledged. First, the cross-sectional design limits the ability to establish causal relationships between psychological distress and the studied variables, as data were collected at a single point in time.

Second, the study relied on self-reported measures, which may be subject to recall bias and social desirability bias, potentially affecting the accuracy of the reported stress, anxiety, and depression levels.

Third, the sample was drawn from a single institution, which may limit the generalizability of the findings to other universities or regions with different academic environments and cultural contexts.

Fourth, although the sample size was acceptable, it was slightly lower than the calculated sample size, which may have reduced the statistical power to detect significant associations.

Finally, the regression model demonstrated limited explanatory power (low R^2 values), suggesting that important variables influencing

psychological distress such as social support, financial stress, physical activity, and coping strategies were not included in the analysis.

Recommendations

Based on the findings of this study, several recommendations can be proposed.

First, universities should implement structured mental health support programs, including counseling services and stress management workshops, particularly targeting students in advanced academic years who are at higher risk of psychological distress.

Second, awareness campaigns focusing on sleep hygiene should be introduced to promote healthy sleep patterns among students, given the high prevalence of sleep deprivation observed in this study.

Third, academic institutions should consider reviewing and optimizing academic workload distribution to reduce excessive stress, especially during clinical training periods.

Fourth, future research should adopt longitudinal study designs to better understand causal relationships between psychological distress and associated factors over time.

Fifth, future studies should include a broader range of variables, such as social support, economic status, physical activity, and coping mechanisms, to improve the explanatory power of predictive models.

Finally, multicenter studies involving multiple universities are recommended to enhance the generalizability of findings and provide a more comprehensive understanding of psychological distress among pharmacy students.

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