

Research Article

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**PREVALENCE OF DEPRESSION AMONG DOCTOR OF PHARMACY  
(PHARM.D) STUDENTS: A DESCRIPTIVE CROSS-SECTIONAL  
STUDY FROM PAKISTAN**

**Madeeha Malik\*<sup>1</sup>, Ayisha Hashmi<sup>2</sup>, Azhar Hussain<sup>3</sup>**

<sup>1</sup>Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad Pakistan

<sup>2</sup>Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad Pakistan

<sup>3</sup>Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad Pakistan

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**\*Corresponding author:  
Madeeha Malik**

Email address:  
[madeehamalik15@gmail.com](mailto:madeehamalik15@gmail.com)

**Present address:**

*Hamdard Institute of  
Pharmaceutical Sciences,  
Hamdard University, Islamabad  
Pakistan*

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**Abstract:**

University students may be at increased risk of depression owing to the pressure and stress they encounter during their studies. Pharmacy education in Pakistan includes strenuous study for 5 years. The demands of the degree program may adversely affect the mental health of the students.

**Objective:** The present study was designed to assess depression among Doctor of Pharmacy students studying at Hamdard University, Islamabad, Pakistan.

**Methodology:** A descriptive cross-sectional study design was used. A pre-validated tool PHQ-9 was self-administered to a sample of 400 Pharm.D students studying at Hamdard University, Islamabad campus. After data collection, data was cleaned coded and entered in SPSS version 21.0. Descriptive statistics comprising of frequency and percentages was calculated. The non-parametric tests including Mann-Whitney and Kruskal-Wallis ( $p \geq 0.05$ ) were performed to find out the difference among different variables.

**Results:** The results of the current study reported mild depression among Pharm.D students. A significant difference ( $p \leq 0.05$ ) was found among mean depression scores of different Pharm. D professional years. However, no significant difference ( $p \geq 0.05$ ) was found among mean depression scores among of different genders, age groups, cities, medium of instruction and parent's income level.

**Conclusion:** The results of the present study concluded minor depression among few of the undergraduate pharmacy students studying at Hamdard University Islamabad Campus. Minor depression was observed among most of the students studying in second professional year. The results are quite encouraging as only a few students were suffering from mild depression in spite of the high level of academic pressure and stress faced by students in pharmacy schools.

**Keywords:** Depression, PHQ-9, Pharm.D, Students, Pakistan

## **INTRODUCTION**

Depression is a frequent mental disorder in most of the societies. It is defined as a common mental disorder, characterized by persistent sadness and a loss of interest in activities that a person normally enjoys, accompanied by an inability to carry out daily activities for at least 2 weeks (Krishnaveni et al, 2018). University students may be at increased risk of depression owing to the pressure and stress they encounter during their studies. [1]. The potential negative effects on students include decreased focus in classroom leading to poor academic performance as well as poor physical health. Several studies have reported stress among the university students and approximately, up to 60% of the university dropouts have been recorded within the first two years due to stress [2]. Students suffering from extreme stress or depression require serious attention; otherwise their inability to cope successfully with education related stress may lead to serious consequences at both personal and professional levels (Pico-Alfonso et al., 2006).

The educational system of Pakistan is no different, as several studies have reported depression among the students of medical colleges in Pakistan [3-5]. The Doctor of Pharmacy (Pharm.D) is a 5 year semester system degree program in Pakistan with 198 credit hours of study. The program includes teaching of theoretical principles as well as clinical training of students. The 5 years program includes more than 40 subjects with approximately five theoretical subjects of four credit hours in each semester which includes theory as well as practical work. This puts the students of an increased chance of developing academic stress which could ultimately lead to depressive symptoms. Limited studies have been conducted on assessment of depression among Pharm.D students in Pakistan. Therefore, the present study was designed to assess the prevalence of depression among Pharm.D students studying at Hamdard University, Islamabad, Pakistan.

## **Methodology**

### **Study Design**

A descriptive cross-sectional study design was used to assess prevalence of depression among Pharm.D students studying at Hamdard University, Islamabad, Pakistan. Ethical approval was taken from ethical committee of Hamdard University. Informed and

verbal consent for participation was also taken from the respondents. Respondents were ensured for the confidentiality of information verbally as well as confidentiality under taking was signed by the principal investigator. Study site for this research was Hamdard University, Islamabad Campus. The sampling frame comprised of Pharm.D students studying at Hamdard University, Islamabad Campus. Students absent on day of data collection and refused to take part in the study were excluded from this study.

#### **Sample Size and Sampling Procedure**

Calculation of sample size was performed by using Rao soft sample size calculator to determine the size of sample representing the population of undergraduate pharmacy students. Sample size was calculated as 227 to achieve 95 % confidence interval with 5% margin of error. In order to minimize erroneous results and increase the study reliability, the target sample size was increased to 400 students. All the respondents that were available at time of data collection and ready to participate in the study were included.

#### **Data Collection Tool**

Data collection tool used in this study was Patient Health Questionnaire (PHQ-9). This self-report scale, which is based on the DSM-IV, has been used to measure both the severity of depressive symptoms as well as the diagnosis of major depression (Kronfol et al, 2018). The PHQ-9 has good sensitivity (.77-.88) and specificity (.88-.94) for detecting major depression in both clinical and general population samples and has been used in large epidemiological studies examining the prevalence of mental health problems in university students (Farrer et al, 2016). Written permission had been obtained from Pfizer Inc. for using PHQ-9. The tool was slightly modified according to study objectives. The survey was introduced. Survey form was given to the respondent. Respondent was instructed on how to fill out the form. Form was retrieved upon completion and checked for completeness before the respondent left. Finally, respondent was thanked for completing the form.

#### **Scoring of the Tool**

The PHQ-9 consists of 9 items which is scored from 0-3 depending on the severity. Scores on the PHQ-9 are usually interpreted as follows: score 0-4: no depression; score

5–9: mild depression; score 10–14: moderate depression and score  $\geq 15$ : severe depression.

### **Reliability and Validity of Tool**

PHQ-9 is a pre-validated tool but still two focus group discussions had been conducted at different time intervals with experts from hospitals, academia, regulatory and pharmaceutical industries for face and content validation of the tool. Beside this pilot testing had been conducted at 10 % of the sample size to test the reliability of the tool after data collection. The value of Cronbach's alpha was 0.918 for PHQ-9, which was satisfactory considering that 0.68 is the cutoff value being disapproved.

### **Data Collection and Analysis**

Data was collected by the principal investigator. The respondents were identified and after obtaining written/ verbal consent from them, the questionnaire was hand delivered to them. The questionnaire was collected back on the same day to avoid study biasness. After data collection, data was cleaned coded and entered in SPSS version 21.0. Skewness test was performed and histograms with normal curves were used to check the normal distribution of data. Descriptive statistics comprising of frequency and percentages was calculated. The non-parametric tests including Mann-Whitney and Kruskal-Walis ( $p \geq 0.05$ ) were performed to find out the difference among different variables.

## **Results**

### **Demographic Characteristics**

Out of 400 respondents, 31.5% (n=126) were males and 68.5% (n=274) were females. Of the total respondents 47.5% (n=190) were less than 20 years of age whereas 52.5% (n=210) were between 20-30 years of age. Of the total respondents, 79.8% (n=319) had studied in an English medium high school whereas 20.2% (n=81) had studied in an Urdu medium high school. Of the total respondents, 28.5% (n=114) were studying in 1st professional, 15.8% (n=63) in 2nd professional, 18% (n=72) in 3rd professional, 20.8% (n=83) in 4th professional and 17% (n=68) in 5th professional. A detailed description is given (Table 1).

**Table 1 Demographic Characteristics**

<b>Variable</b>	<b>n (%)</b>
<b>Gender</b>	
Male	126 (31.5%)
Female	274 (68.5%)
<b>Age</b>	
<20 years	190 (47.5%)
20-30 years	210 (52.5%)
<b>City</b>	
Islamabad	159 (39.8%)
Rawalpindi	154 (38.5%)
KPK	87 (21.8%)
<b>Setting</b>	
Urban	345 (86.2%)
Rural	55 (13.8%)
<b>Medium of instruction in high school</b>	
English	319 (79.8%)
Urdu	81 (20.2%)
<b>Professional Year of Pharm.D</b>	
1 <sup>st</sup> professional	114 (28.5%)
2 <sup>nd</sup> professional	63 (15.8%)
3 <sup>rd</sup> professional	72 (18%)
4 <sup>th</sup> professional	83 (20.8%)
5 <sup>th</sup> professional	68 (17%)
<b>Parents income</b>	
<Rs.10,000	19 (4.7%)
Rs.10,000-20,000	21 (5.2%)
Rs.21,000-30,000	21 (5.2%)
Rs.31,000-40,000	8 (2%)
Rs.41,000-50,000	10 (2.5%)
>Rs.50,000	15 (3.7%)
Not responded	306 (76.5%)

### **Assessment of Depression among Undergraduate Pharmacy Students**

The results highlighted that few of the respondents (n=157, 39.2%) were of the view that they felt little interest or pleasure in doing things several days a week. Majority of the respondents (n=160, 40%) were of the view that they did not felt down, depressed or hopeless. Nearly half of the respondents (n=182, 45.5%) had no trouble falling asleep, staying asleep or sleeping too much. The current study highlighted that majority of the respondents (n=242, 60.5%) didn't felt bad about themselves - or that they are a failure or have let themselves or their family down didn't had trouble concentrating on things (Table 2).

**Table 2 Assessment of Depression among Undergraduate Pharmacy Students**

Indicators		n (%)
Little interest or pleasure in doing things	Not at all	100 (25%)
	Several days	157 (39.2%)
	More than half the days	61 (15.2%)
	Nearly every day	82 (20.5%)
Feeling down, depressed or hopeless	Not at all	160 (40%)
	Several days	147 (36.8%)
	More than half the days	56 (14%)
	Nearly every day	37 (9.2%)
Trouble falling asleep, staying asleep or sleeping too much	Not at all	182 (45.5%)
	Several days	98 (24.5%)
	More than half the days	40 (10%)
	Nearly every day	80 (20%)
Feeling tired or having little energy	Not at all	105 (26.2%)
	Several days	164 (41%)
	More than half the days	62 (15.5%)
	Nearly every day	69 (17.2%)
Poor appetite or overeating	Not at all	192 (48%)
	Several days	103 (25.8%)
	More than half the days	59 (14.8%)
	Nearly every day	46 (11.5%)
Feeling bad about yourself- or that you are a failure or have let yourself or your family down	Not at all	242 (60.5%)
	Several days	100 (25%)
	More than half the days	28 (7%)
	Nearly every day	30 (7.5%)
Trouble concentrating on things, such as reading the newspaper or watching television	Not at all	227 (56.8%)
	Several days	111 (27.8%)
	More than half the days	28 (7%)
	Nearly every day	34 (8.5%)
Moving or speaking so slowly that other people could have noticed OR, the opposite- being so fidgety or restless that you have been moving around a lot more than usual	Not at all	250 (62.5%)
	Several days	86 (21.5%)
	More than half the days	35 (8.8%)
	Nearly every day	29 (7.2%)
Thoughts that you would be better off dead or of hurting yourself in some way	Not at all	249 (62.2%)
	Several days	81 (20.2%)
	More than half the days	36 (9%)
	Nearly every day	34 (8.5%)

### **Mean Scores of Depression among Undergraduate Pharmacy Students by Demographic Variables**

The mean scores highlighted that males were comparatively less depressed (7.72,  $\pm 5.21$ ) as compared to female students (8.05,  $\pm 5.54$ ). The results showed that students having age between 20-30 years (7.61,  $\pm 5.32$ ) showed minimal depressive symptoms as compared to students having age less than 20 years (8.31,  $\pm 5.55$ ). Mean scores highlighted that students living in Islamabad showed less depressive symptoms (7.44  $\pm 5.46$ ) as compared to students belonging to various cities of KPK (8.79,  $\pm 5.18$ ). Students studying in 5<sup>th</sup> professional had minimal depressive symptoms (6.70,  $\pm 5.24$ ) as compared to students studying in 2<sup>nd</sup> professional (9.42,  $\pm 5.79$ ). The mean scores highlighted those students whose parents had income greater than Rs. 50,000 showed minimal depressive symptoms (7.06,  $\pm 5.09$ ) as compared to those students whose parent income level was less than Rs. 10,000 (9.47,  $\pm 6.29$ ). A detailed description is given (Table 3).

**Table 3 Mean Scores of Depression among Undergraduate Pharmacy Students by Demographic Variables**

<b>Variable</b>	<b>Mean (<math>\pm</math>SD)</b>
<b>Gender</b>	
Male	7.72 ( $\pm 5.21$ )
Female	8.05 ( $\pm 5.54$ )
<b>Age</b>	
<20 years	8.31 ( $\pm 5.55$ )
20-30 years	7.61 ( $\pm 5.32$ )
<b>City</b>	
Islamabad	7.44 ( $\pm 5.46$ )
Rawalpindi	7.99 ( $\pm 5.52$ )
KPK	8.79 ( $\pm 5.18$ )
<b>Setting</b>	
Urban	7.98 ( $\pm 5.57$ )
Rural	7.74 ( $\pm 4.52$ )
<b>Medium of instruction in high school</b>	
English	8.03 ( $\pm 5.57$ )
Urdu	7.60 ( $\pm 4.88$ )
<b>Professional Year of Pharm.D</b>	
1 <sup>st</sup> professional	7.44 ( $\pm 5.16$ )
2 <sup>nd</sup> professional	9.42 ( $\pm 5.79$ )
3 <sup>rd</sup> professional	7.04 ( $\pm 4.88$ )
4 <sup>th</sup> professional	9.32 ( $\pm 5.71$ )
5 <sup>th</sup> professional	6.70 ( $\pm 5.24$ )

<b>Parents income</b>	9.47 (±6.29)
<Rs.10,000	8.38 (±3.91)
Rs.10,000-20,000	7.33 (±5.65)
Rs.21,000-30,000	9.37 (±6.84)
Rs.31,000-40,000	7.45 (±5.89)
Rs.41,000-50,000	7.06 (±5.09)
>Rs.50,000	7.87 (±5.45)
Not responded	

### Comparison of Depression among Undergraduate Pharmacy Students by Demographic Characters

A significant difference ( $p \leq 0.05$ ) was found among mean depression scores of different Pharm. D professional years. However, no significant difference ( $p \geq 0.05$ ) was found among mean depression scores among of different genders, age groups, cities, medium of instruction and parent's income level. A detailed description is given (Table 4).

**Table 4 Comparison of Depression among Undergraduate Pharmacy Students by Demographic Characters**

Indicators	Depression			
	n	Mean ranks	Test statistics	p-value
<b>Gender</b>				
Male	125	197.61	16830.00 <sup>a</sup>	0.735
Female	275	201.81		
<b>Age</b>				
<20Y	191	207.09	18700.00 <sup>b</sup>	0.275
20-30Y	209	194.48		
<b>City</b>				
Islamabad	159	187.83	5.279 <sup>a</sup>	0.071
Rawalpindi	154	200.77		
KPK	87	223.18		
<b>Setting</b>				
Urban	345	199.86	9268.000 <sup>a</sup>	0.782
Rural	55	204.49		
<b>Medium of instruction in high school</b>				
English	319	201.35	12650.00 <sup>a</sup>	0.769
Urdu	81	197.14		
<b>Current professional of Pharm.D</b>				
1 <sup>st</sup> Professional	114	190.61	18.50 <sup>b</sup>	<b>0.001</b>
2 <sup>nd</sup> Professional	63	231.88		
3 <sup>rd</sup> Professional	72	182.01		
4 <sup>th</sup> Professional	83	231.93		
5 <sup>th</sup> Professional	68	169.22		



**Parents Income**

<Rs.10,000	19	228.42	3.093 <sup>b</sup>	0.686
Rs.10,000-20,000	21	223.81		
Rs.21,000-30,000	21	184.86		
Rs.31,000-40,000	8	227.69		
Rs.41,000-50,000	10	240.59		
>Rs.50,000	15	188.30		
Not responded	306	198.20		

Mann-Whitney<sup>a</sup>;Kruskal Wallis Test<sup>b</sup> ( $p \leq 0.05$ )

**Discussion**

Depression is one of the most common psychological disorders diagnosed among undergraduate pharmacy students. Pharmacy students tend to be more depressed than other undergraduate students due to the high level of academic and psychosocial pressures. The results of the present study reported minimal symptoms of depression among undergraduate pharmacy students. Only a small proportion of students were suffering from mild, moderate and severe depression. The findings of the current study highlighted that female students were more likely to exhibit mild depressive symptoms as compared to male students. Similar results were reported in a study conducted in Cameroon, Iran and Egypt where female students had higher prevalence of mild depression as compared to their male counterparts [6-8].

The results of the present study highlighted that pharmacy students having age less than 20 years suffered from mild depression as compared to students aged greater than 20 years. This might be due to the fact that younger students were unable to handle academic pressure and suffered from depression. Similar findings have been reported in a study conducted in Saudi Arabia [9]. The results of the present study revealed that mild depression was prevalent among students belonging to KPK as compared to students residing in Islamabad and Rawalpindi. Similar findings were reported in a study conducted in Pakistan [10].

Moreover, the present study revealed that students residing in urban settings reported higher level of depression as compared to students residing in rural settings. Similar findings were reported in a study conducted in El Salvador where students residing in urban settings reported more depressive symptoms as compared to students belonging to rural areas [11]. The results of the current study highlighted that students studying in second professional had higher level of depression as compared to students studying in

their fifth professional. This might be due to the fact that increased workload and a shift of focus from basic medical sciences subject to more pharmacy oriented subjects may lead to more academic pressure on students studying in 2<sup>nd</sup> professional. Similar results were reported from studies conducted in Saudi Arabia and India [12, 13]. The results of the current study highlighted that students whose parents income was between Rs.41,000-50,000 reported higher level of mild depression as compared to students whose parents income level was between Rs.21,000-30,000. Similar results were reported in a study conducted in China [14].

### **Conclusion**

The results of the present study concluded minor depression among few of the undergraduate pharmacy students studying at Hamdard University Islamabad Campus. Minor depression was observed among most of the students studying in 2<sup>nd</sup> professional. The results are quite encouraging as only a few students were suffering from mild depression in spite of the high level of academic pressure and stress faced by students in pharmacy school. The present study showed that Pharm.D students are capable of handling stress and can play effective role in stress management. However, in order to decrease the incidence of depression among undergraduate pharmacy students' counseling centers should be established within pharmacy schools. Furthermore, workshops on study techniques, stress and time management should be conducted for students to train them effectively for stress management.

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