

Frequency of Anxiety, Depression and Stress among Pharmacy Undergraduates of Annual and Semester System: A Cohort-Based Comparison

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Abstract

Objectives: The current study was aimed to evaluate the anxiety, depression and stress (AD&S) among two different academic performance systems (i.e. semester and annual system). **Methods:** A questionnaire—based, cross-sectional survey technique was adopted. The Depression, Anxiety and Stress Scale (DASS) was used to assess the AD&S among pharmacy undergraduates enrolled at Faculty of Pharmacy and Health Sciences, University of Balochistan Quetta. SPSS v 20.0 was used for data coding and analysis whereas both descriptive and inferential statistics were used for data elaboration. **Results:** Two hundred and eighty-nine pharmacy undergraduates participated in the study with a distribution of 43.3% belonging to the annual academic system and 56.7% from the semester system. Students Majority were of 20 years old (59, 20.4%), including both male (194, 67.1%) and female (95, 32.9%). The mean AD&S scores of the entire cohort were 14.15±9.3, 13.61±7.9 and 18.18±8.2 respectively representing moderate AD&S among pharmacy undergraduates. Statistically significant difference ($p<0.05$) was reported among students of annual and semester system for all three variables of study whereby the students of semester system were more in AD&S as compared to the annual system. **Conclusion:** Based on the findings of current study it is suggested that measure should be taken to reduce the AD&S among students for better academic performance. This is achievable by engaging students by inquiring their queries and problems faced during the semester-related activities. By doing so, a stress-free environment is predicted hence bringing academic prosperity among students leading to the development of a more qualified and satisfied future pharmacist. **Key words:** Anxiety, Depression, Stress, Pharmacy, Undergraduates.

INTRODUCTION

Stress is connected to human life and its effects on mental and physical health is broadly investigated in academic and scientific research.^[1] Where stress induced by academic activities generate sense of motivation and competition among students and encourages learning,^[2] it sometimes develops anxiety and depression that results helplessness and poor academic performance.^[3] The literature reports that because of the very immense academic pressure students are indulged in academic misconduct and substance abuse.^[4] Few students quit their academic programs while some are also reported to have attempted suicides.^[5] In literature the term ‘academic stress’ has been widely used to assess incidence and impact of stress related to studies on students and their performance which may be affected negatively.^[6] Another term ‘examination related stress’ has also been reported in literature but it is difficult to determine how much the both terms overlies. Examination is the essential part of academic activities and stress induced by examination is considered as subtype of academic stress therefore, examination stress is more focused to evaluate the academic stress.^[6-8] Within this context, medical and pharmacy students generally must go through a comprehensive curriculum and competitive environment throughout their studies.^[9] Hence, students continually experience mental distress due to fear and dissatisfaction related to academic failure. A high prevalence of stress (12.9%) and rate of suicide attempt (2.7%) was reported in medical students of Sweden.^[10] Another study explored the prevalence of academic stress in Thai medical

students and found a surprising figure of 61.4%.^[11] As far as the Pakistani medical students are concerned, they have shown 20.8% prevalence of stress which was strongly coupled with reduced academic performance in Lahore, Pakistan.^[12] Numerous other studies have also reported elevated level of stress among medical students^[13] whereas few studies compared the level of stress among undergraduates (medical and non-medical students) and revealed high level of academic stress in medical students.^[10,14] In Pakistan, Higher Education Commission (HEC) of Pakistan is responsible for formulation and standardization of pharmacy curriculum; it is continually improved, revised and implemented throughout Pakistan to sustain consistency and harmonization among all pharmacy institutions of Pakistan. Pharmacy institutes of Pakistan mainly follow module-based curriculum which is further divided into two methods of assessment widely accepted by the pharmacy colleges. Among these one of the systems is based on annual examination in which students’ performance is evaluated as either pass or fail and result is interpreted as percentile. While others employ semester system with two semesters per annum and students must appear four times in the examination every year. Result of the students following the semester system is presented by calculating Grade Point Average (GPA). It is very similar to other grade-tiered assessment systems.^[15] In line to what is reported, HEC changed its policy and recommended to implement semester system throughout the Pakistan in 2017. Where quite a few pharmacy institutes have adopted semester system, it is in transitory stage and at the same time senior students

are going through annual system whereas juniors are going through semester system. While considering the evaluation of students in revised system, the need arises to assess the depression and anxiety related to academic stress along with its prevalence against the significance of educational outcomes. According to literature review we could not find any study conducted in Quetta, Pakistan to assess academic stress in students undergoing annual and semester system. Therefore, we designed this cross-sectional study to compare level of academic stress between pharmacy students enrolled in conventional annual system and newly implemented semester system with the aim to identify which system keeps the stress level to minimum while keeping students' performance intact.

METHODOLOGY

Study design and settings

The study design was cross-sectional and the research was conducted at the Faculty of Pharmacy and Health Sciences, University of Balochistan Quetta. The University came into being with the promulgation of the University of Balochistan Ordinance 1970. In terms of human resource, the province of Balochistan is passing through a process of rapid socio-economic development and needs well qualified and competent scientists, professionals, academicians and administrators. The University is cognizant of this need and prepared to provide meaningful higher education to the youth of the province. The University is committed to develop and sustain an environment conducive to excellence in teaching, learning, research and spread of knowledge.^[16]

Study duration, sampling technique and inclusion criteria

The study was conducted for 8 months i.e. March to October 2019. Universal sampling was adopted and all students enrolled for the pharmacy program were contacted for data collection.^[17] Students enrolled in the morning program and willing to participate in the study were included.

Study tool

The Depression, Anxiety and Stress Scale (DASS) is a valid and reliable tool used for the assessment of AD&S. It comprises of 42 self-reported items to be completed over five to ten minutes, each reflecting an emotional symptom.^[18] The questionnaire was developed in English language then translated into Urdu by using standard procedure for the convenience of students. The questionnaire was self-completed and included two major parts. The first part included questions about personal characteristics of the respondent. Second part involved questions related to respondent's perception regarding AD&S.

Data collection

Written consent was taken from all the participants ensuring their anonymity and confidentiality. All questionnaires were filled on the spot and were cross checked for completion and all errors or discrepancies were resolved. The obtained data was entered and analyze in Statistical Package for the Social Sciences (SPSS) version 21. Both descriptive and inferential statistics were used with $p < 0.05$ taken as significant.

Ethical approval

Institutional ethical committee of Faculty of Pharmacy and Health Sciences approved the study. In addition, permission from the Dean, Faculty of

Pharmacy and Health Sciences was also taken prior to the data collection.

RESULTS

Table 1 presents demographic characteristics of the study respondents. Out of 425 enrolled students, 289 participated with a response rate of 68%. Majority of the respondents were 20 year (59, 20.4%). The cohort was dominated by males (194, 67.1%). Sixty-six (22.8%) students were from first professional followed by (53, 18.3%), (45, 15.6%), (57, 19.7%) and (68, 23.5%) from second, third, fourth and fifth professional respectively. Out of these, data were collected from 125 students of annual system (fourth and fifth year) and 164 students of semester system (first, second and third year).

Assessment of anxiety, depression and stress among the pharmacy undergraduates

The AD&S were scored as per criteria proposed by the developers.^[18] The mean AD&S scores of the entire cohort were 14.15 ± 9.3 , 13.61 ± 7.9 and 18.18 ± 8.2 respectively representing moderate AD&S among pharmacy undergraduates. The scores and the distributions are presented in Table 2-4 respectively.

Comparison of anxiety, depression and stress among annual and semester system (intergroup analysis)

The intergroup analysis is presented in Table 5. The Man Whitney test was used for comparing annual system with semester system. A statistically significant difference ($p < 0.05$) was reported among all three variables (anxiety, depression and stress). The interpretation of the mean ranks revealed students of the semester system being faced with AD&S when compared to the students of annual system (high rank being a reflective of faced with more AD&S).

DISCUSSION

Among various disciplines, pharmacy is one of the renowned professions offering individuals a rewarding and meaningful career. However, it is not surprising that pharmacy education is meticulous and challenging venture which is carried out in a competitive professional atmosphere.^[19] In such a challenging environment there are several stressors which can affect health

Table 1: Demographics characteristics of the study respondents.

Demographics	Frequency	Percentage
Age of respondents		
18	11	3.8
19	32	11.1
20	59	20.4
21	44	15.2
22	50	17.3
23	46	15.9
24	27	9.3
25	47	16.2
Gender		
Male	194	67.1
Female	95	32.9
Year of study		
First	66	22.8
Second	53	18.3
Third	45	15.6
Fourth	57	19.7
Final	68	23.5
Study system		
Annual	125	43.3
Semester	164	56.7

of the students. Change of system of evaluation is one of the stressors, as recently HEC has changed its system of evaluation from annual to semester system.^[20] The current study was aimed to identify various psychological disorders among pharmacy students having different mode of evaluation.

The data was collected from 289 pharmacy students having age range from 18-27 years studying in first to final year of pharmacy came from different socio-economic background. Our result agrees to what was reported by Iqbal and colleagues.^[21] It is well known because students join pharmacy

Table 2: Assessment of depression among pharmacy undergraduates.

Questions	Responses			
	Did not apply to me at all N (%)	Apply to me at all to some degree N (%)	Apply to me to a considerable degree N (%)	Apply to me very much N (%)
I couldn't seem to experience any positive feeling at all	129 (44.6)	97 (33.6)	47 (16.3)	16 (5.5)
I just couldn't seem to get going	105 (36.3)	113 (39.1)	45 (15.6)	26 (9.0)
I felt that I had nothing to look forward to	128(44.3)	89 (30.8)	38 (13.1)	34 (11.8)
I felt sad and depressed	92 (31.8)	103 (35.6)	50 (17.3)	44(15.2)
I felt that I had lost interest in just about everything	88 (30.4)	107(37.0)	63 (21.8)	31 (10.7)
I felt I wasn't worth much as a person	141 (48.8)	72 (24.9)	35 (12.1)	41 (14.2)
I felt that life wasn't worthwhile	155 (53.6)	61 (21.1)	46 (15.9)	27 (9.3)
I couldn't seem to get any enjoyment out of the things I did	103 (35.6)	104 (36.0)	54 (18.7)	28 (9.7)
I felt down hearted and blue	74 (25.6)	108 (37.4)	67 (23.2)	40 (13.8)
I was unable to become enthusiastic about anything	107 (37.0)	98 (33.9)	58 (20.1)	26 (9.0)
I felt I was pretty worthless	120 (41.5)	79 (27.3)	53 (18.3)	37 (12.8)
I could see nothing in the future to be hopeful about	129 (44.6)	75 (26.0)	39 (13.5)	46 (15.9)
I felt that life was meaningless	150 (51.9)	66 (22.8)	34 (11.8)	39 (13.5)
I found it difficult to workup the initiative to do things	84 (29.1)	93 (32.2)	76 (26.3)	35 (12.5)

The mean depression score of the entire cohort was 13.61±7.9 indicating moderate level of depression

Table 3: Assessment of anxiety among pharmacy undergraduates.

QUESTIONS	Responses			
	Did not apply to me at all N (%)	Apply to me at all to some degree N (%)	Apply to me to a considerable degree N (%)	Apply to me very much N (%)
I was aware of dryness of my mouth	121 (41.9)	107 (37.0)	46 (15.9)	15 (5.2)
I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	134(46.4)	90(31.1)	45(15.6)	20(6.9)
I had feeling of shakiness	145(50.2)	81(28.0)	46(15.9)	17(5.9)
I found myself in situations that made me so anxious I was most relieved when they ended	42(14.5)	80(27.7)	84(29.1)	83(28.7)
I had a feeling of faintness	151(52.2)	77(26.6)	38(13.1)	23(8.0)
I perspired noticeably (e.g. hands sweaty) in the absence of high temperatures or physical exertion	145(50.2)	77(26.6)	43(14.9)	24(8.3)
I felt scared without any good reason	124(42.9)	90(31.1)	51(17.6)	24(8.3)
I had difficulty in swallowing	163(56.4)	82(28.4)	30(10.4)	14(4.8)
I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	89(30.8)	97(33.6)	68(23.5)	35(12.1)
I felt I was close to panic	94(32.5)	92(31.8)	61(21.1)	42(14.5)
I feared that I would be "thrown" by some trivial but unfamiliar task	119(41.2)	85(29.4)	62(21.5)	23(8.0)
I felt terrified	127(43.9)	88(30.4)	43(14.9)	31(10.7)
I was worried about situations in which I might panic and make a fool of myself	83(28.7)	91(31.5)	75(26.0)	40(13.8)
I experienced trembling (e.g. in the hands)	132(45.7)	92(31.8)	49(17.0)	16(5.5)

The mean anxiety score of the entire cohort was 14.15±9.3 indicating moderate level of depression

Table 4: Assessment of stress among pharmacy undergraduates.

QUESTIONS	Responses			
	Did not apply to me at all N (%)	Apply to me at all to some degree N (%)	Apply to me to a considerable degree N (%)	Apply to me very much N (%)
I found myself getting upset by quite trivial things	72 (24.9)	145 (50.2)	38 (13.1)	34 (11.8)
I tended to over-react to situations	69 (23.9)	134 (46.4)	59 (20.4)	27 (9.3)
I found it difficult to relax	70 (24.2)	111 (38.4)	62 (21.5)	46 (15.9)
I found myself getting upset rather easily	82 (28.4)	103 (35.6)	57 (19.7)	47 (16.3)
I felt that I was using a lot of nervous energy	68 (23.5)	99 (34.3)	76 (26.3)	46 (15.9)
I found myself getting impatient when I was delayed in any way(e.g. lifts, traffic lights, being kept waiting)	61 (21.1)	102 (35.3)	68 (23.5)	58 (20.1)
I felt that I was rather touchy	57 (19.7)	102 (35.3)	64 (22.1)	66 (22.8)
I found that I was very irritable	91(31.5)	94 (32.5)	65 (22.5)	39 (13.5)
I found it hard to wind down	86 (29.8)	97 (33.6)	54 (18.7)	52 (18.0)
I found it hard to calm down after something upset me	71 (24.6)	109 (37.7)	66 (22.8)	43 (14.9)
I found it difficult to tolerate interruptions to what I was doing	76 (26.3)	85 (29.4)	73 (25.3)	55 (19.0)
I was in a state of nervous tension	102 (35.3)	86 (29.8)	60 (20.8)	41 (14.2)
I was intolerant of anything that kept me from getting on with what I was doing	53 (18.3)	86 (29.8)	75 (26.0)	75(26.0)
I found myself getting agitated	80 (27.7)	90 (31.1)	66 (22.8)	53 (18.3)

The mean stress score of the entire cohort was 18.18±8.2 indicating moderate level of depression

Table 5: Intergroup analysis (students of annual versus the semester system).

Study system	N	P-value	Mean rank
Total Stress Annual Semester	125 164	0.034	133.10 154.07
Total Anxiety Annual Semester	125 164	0.001	126.47 159.12
Total Depression Annual Semester	125 164	<0.001	123.75 161.20

program immediately after completion of their intermediate in pre-medical, which is the prerequisite of Pharmacy Council of Pakistan.^[22] Further, all those students who acquired their degrees in intermediate in last two years can take admission in Pharmacy thus the age proportion remain the same in every pharmacy school. Male participants dominated the cohort in the present study by 67.1% contradicting to the result of other study by Mayer and colleagues.^[23] Possible reason for this contradicting result is that in Balochistan province people don't favor female education therefore, only bright female students who do well in their school and college qualify for pharmacy profession. In addition, co-education is not preferred in the area whereas University of Balochistan is the only institute offering Pharmacy education and it offers co-education, resulting in decreased number of female students.

In our study the students learning in annual and semester system were 43.3% and 56.7% respectively. Difference in these values is due to transition stage between annual to semester system, initial three professionals were studying in semester while the last two were in annual thus, the percentage in semester is at higher side. Overall moderate AD&S was reported by the pharmacy students in our study, the findings are in line to what was also reported in western countries. In United Kingdom, 24% prevalence of depression was reported among medical students.^[24] Students of Michigan Medical School were reported to have 14.3% prevalence of depression.^[25] In Pakistan the

reported prevalence rate was 57.6%^[26] and variety of reasons can be ascribed to these fractions of increased prevalence in this region. A correlation was reported in anxiety and depression with frustration in evaluation criteria, overstrained test plans and stress to qualify exams.^[27] In Pakistan there is a lot of pressure by the families to choose pharmacy profession which is followed by the pressure of doing well in the academics. Stress among medical pharmacy is seen frequently but it is under reported and under treated. Further the students seldom search for expert opinion, generally due to disgrace regarding mental fitness.

Findings of our study revealed that depression among students of annual system is less (mean rank 123.75) as compared to semester system (mean rank 161.20) representing a larger extent of assessment linked anxiety in students registered in the semester system. Like the results of our study another identical research was conducted in Mayo Medical School which revealed the minimum level of stress assumed by the students evaluated in annual, as compared to the students assessed according to five interval grading system.^[28] Another study conducted at University of Virginia reported that by applying annual system of assessment in medical school, students showed greater degree of satisfaction, personal lives and psychological wellbeing.^[29] Lastly, a study conducted in medical schools of United States reported that high level of stress and emotional fatigue was seen in students assessed through semester system, as this system increased the possibility of dropping out of school by the student altogether.^[30] Annual system of evaluation was believed to distort distinctions among students of diverse educational capabilities and decrease motivation of the students. On the contrary semester system of evaluation was considered to support students in taking regular classes, letting pharmacy schools to offer exigent courses with consistent grading and encourage students to participate on a standardized platform. This system of evaluation is associated in success of studies, development of career and attainment.^[31] Whereas, in other studies it was revealed that annual system of evaluation did not diminish motivation and performance of students in medical schools, but annual system found to be coupled with increased degree of contentment with standard of education and performance as compared to semester system.^[5,29] Our result was consistent

to these studies, where students of annual system were completely satisfied regarding academic performance when compared with the semester system.

CONCLUSION

Our study concluded that students evaluated under annual system have relatively reduced stressful academic life as compared to students with semester system. Therefore, when grading system must be formulated for pharmacy students, the one which puts less stress must be preferred over the other considering students' comfort and academic outcome. Higher Education Commission of Pakistan which is a governing body for designing and implementing curricula and mode of assessment may revise the framework and utilize a homogeneous system of evaluation in pharmacy institutes, which may have positive effects on student's life by reducing stressors, enhancing performance and adopting a better professional career.

Limitations

Our study was single centered and convenient sampling method was used which does not eliminate the risk of selection bias. A multicenter study involving more pharmacy institutes with larger sample size evaluating academic stress independently will present improved insight of the subject.

CONFLICT OF INTEREST

The authors declare no conflict of interest. No funding was received for this study.

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