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DEPRESSION;
PRIVATE UNDERGRADUATE MEDICAL STUDENTS

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ABSTRACT… Psychological stress is prevalent in medical schools and is associated with depression. The personal and social sacrifices young medical apprentices have to make in order to sustain a fine academic outcome in an exceedingly competitive education sets them under enormous strain. The estimated prevalence of depression among private medical students has been 19% in United States, 49% in India, and 60% in Pakistan. Pakistan boasts highest prevalence of depression globally among undergraduate private medical students. Additionally a lack of any prior study in this institution, this study aimed to find prevalence of depression in the undergraduate private medical college of Lahore. **Setting:** The subjects were students of Shalamar Medical and Dental College, Lahore a private institution, in a metropolitan urban population. **Study Design:** Cross sectional study based on systematic random sampling technique. **Methods:** A modified, self-administered, structured questionnaire based on Goldberg's depression scale was distributed to a sample of 240 subjects during March 2014, till October 2014. Higher total scores refer to higher depression levels. Prior to the initiation of research permission was sought from the institution's ethical review committee. The data entry and analyses were done in SPSS for Windows version 20.0. **Results:** The response rate was 80%. The age of students (n= 164) averaged 21.1 ±1.4 years. The prevalence of depression among undergraduate medical students of our setting was almost 63% (n= 122). Thirty one percent (n=59) were possibly mildly depressed, 9% (n=17) borderline depressed, 19% (n=37) mild to moderate cases, 20% (n=39) moderate to severe cases and 3 % (n=6) were severely depressed students. Almost 85% (n= 40) of the students from second year suffered from depression the highest prevalence among all undergraduate medical years. A substantial 41% (n= 36) and 42 % (n= 37) of students suffering from depression admitted to the use of taking stimulants like amphetamines and caffeine respectively. **Conclusion:** The prevalence of depression is highest among the students of second academic year. Terminal illness of a family member and effect of law and order situation of the country also compromise the mental health of undergraduate medical students.

Key words: Depression, undergraduate medical students, Goldberg Depression Scale

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INTRODUCTION

Depression is a noteworthy contributor to the worldwide burden of disease[1,2] and it affects people in all societies across the world.[1] It is a common psychological disorder which frequently starts at a young age.[1] It presents with depressed mood, anhedonia, reduced energy, thoughts of guiltiness, low self-esteem, troubled sleep, appetite disturbances, and poor concentration.[1] Psychological stress is prevalent in medical schools and is associated with depression.[3] Medical students suffer with more signs of depression than the general population and age-matched peers.[4] The personal and social sacrifices young medical apprentices have to make in order to continue to a fine academic outcome in an exceedingly competitive education sets them under enormous nervous tension.[3] Studies propose that existing educational processes may have an inadvertent detrimental effect on students' mental health resulting in a high frequency of depression and anxiety among international and Pakistani medical students.[4,5,6,7] In addition, stress in medical students has

also been linked to academic dishonesty and decrease empathy.[8]

Among medical students, educational stressors include the amount of subject matter to be learnt, academic performance and evaluations including examinations and nonstop assessments.[9] Situational stressors include perverse effort hours, sleep deprivation, disproportionate work load, and less optimal conditions for learning.[10] Personal stressors include family and monetary issues; seclusion, exacerbated by relocation away from family and acquaintances; limited free time to develop new support systems; psychosocial concerns due to the anxiety of residency; topped up with higher family expectations and inadequate coping abilities.[8,10] Professional stressors include liabilities of patient care, information overload, and career planning, lack of guidance from seniors and faculty.[8,10]

The prevalence of depression among medical students in public universities has been estimated to be 10% in Greece, 15 % in USA, 22% in Malaysia, 24% in UK, 29% in India, and 44% in Pakistan.[5] The prevalence of depression among private medical students, on the other hand, has been estimated to be 19% in USA, 49% in India, and 60% in Pakistan.[5] Due to the worldwide highest prevalence of depression among undergraduate private medical students of Pakistan, and lack of any prior study in this institution, this study aimed to find prevalence of depression in an undergraduate private medical college of Lahore.

METHODS

This was a cross sectional study based on systematic random sampling technique. A modified, self administered, structured questionnaire based on Goldberg's depression scale was distributed to a sample of 240 subjects. The subjects were students of Shalamar Medical and Dental College, Lahore a private institution, in an urban population, who gave a signed informed consent. The confidentiality and anonymity of the subjects was conserved. Prior to the initiation of research permission was sought from the institution's ethical review committee. Goldberg's depression scale consists of eighteen items and is an appropriate instrument for screening depression.[11] The questionnaire ranks the screened individuals into six categories based on their calculated scores for individual responses to a particular stem[11] (Table-I). The questionnaire was modified to allow questions which can retrieve associations. The usual administration time was about five minutes. Due to high reliability and validity against a reliable psychiatric assessment schedule of sixty questions this instrument had a previously calculated specificity and a sensitivity of 91% and 86%[11] and a positive predictive value of 85%.[12] Higher total scores refer to higher depression levels.[11] For purposes of further analyses, the students with a score of 22 and above were considered suffering from depression and those who score 21 and less were considered free from the illness. The individuals who scored above 21 were counseled and referred to the relevant expert health authorities. The data entry and analyses were done in SPSS for Windows version 20.0 (SPSS, Inc., Chicago, IL, USA). Wherever mentioned the p value was considered significant at.05 levels.

Score	Category
0-9	Depression unlikely
10-17	Possibly mildly depressed
18-21	Borderline Depression
22-35	Mild to moderate depression
36-53	Moderate to severe depression
54 or more	Severely depressed

Table-I. Interpretation of scores of Goldberg Depression Scale

RESULTS

The survey questionnaire was distributed to a sample of 240 students, 192 returned the filled questionnaire, and hence the response rate was 80%. The age of students (n= 164) averaged 21.1 ±1.4 years during March 2014, till October 2014 (8 months), samples from Shalamar Medical and Dental College, Lahore (Figure-1). During this period, an estimated 41.2 % (n= 80) students were males, whereas 57.7% (n= 112) were females. About 65% (n= 126) of the students were day scholars and 35% (n=67) availed on or off

campus college accommodations. An estimated 29 % (n= 56) students admitted taking energy drinks, whereas almost 8% (n= 15) admitted taking amphetamines. Nearly half 49.5% (n= 47) of students of preclinical basic sciences (n= 95) admitted to the use of commonly available energy drinks in comparison to the 25% (n= 9) students of clinical years (n= 36).A sizable 41% (n= 36) and 42 % (n= 37) of students suffering from depression admitted to the use of taking stimulants like amphetamines and caffeine respectively (Figure-2).

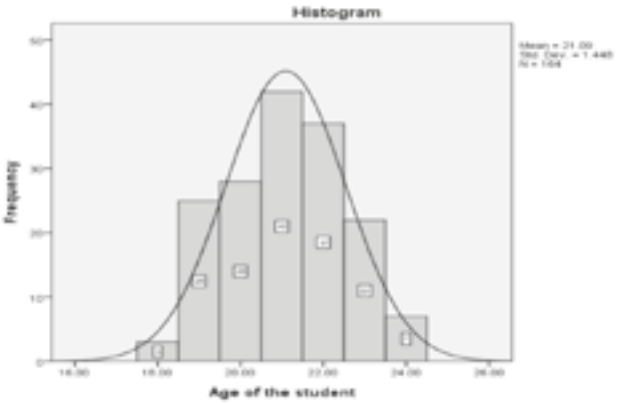

Figure-1. Average age of students

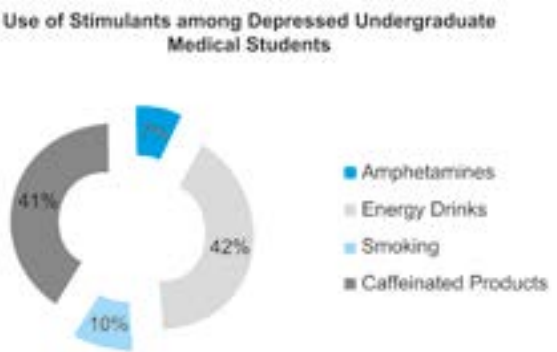

Figure-2. Use of stimulants among depressed undergraduate medical students

Among all students (n=192) only 9% (n=17) had foreign nationalities whereas 91% (n=175) were nationals of Pakistan. A chi-square test was performed to examine the relation between depression and having a foreign citizenship. The relation between these variables was highly significant, X^2 (1, n= 186) = 9.258, p= .002. A Spearman's rank-order correlation was run to determine the relationship between depression and having foreign citizenship. There was a weak correlation between these variables r_s = .220, (n = 192, p = .002) (Table-I).

According to the categories of Goldberg scale 18% (n=17) of all the students (n=192) were free of any kind of depression. At the same time, 31% (n=59) were possibly mildly depressed, 9% (n=17) borderline depressed, 19% (n=37) mild to moderate cases, 20% (n=39) moderate to severe cases and 3 % (n=6) were severely depressed students. The individuals who scored above 21 were counseled and referred to the relevant expert health authorities. For purposes of further analyses, the students with a score of 22 and above were considered suffering from depression and those who score 21 and less were considered free from the illness. Therefore the prevalence of depression among undergraduate medical students was almost 63% (n= 122).Almost 85% (n= 40) of the students from second year suffered from depression the highest prevalence among all undergraduate medical years. In comparison only 44% (n= 16) of fourth year reported any symptoms of depression (Figure-3). A chi-square test was also carried out to observe the relation between depression and academic year of undergraduate medical students. The relation between these variables was highly significant, X^2 (4, n= 191) = 21.401, p= .000 (Table-I).

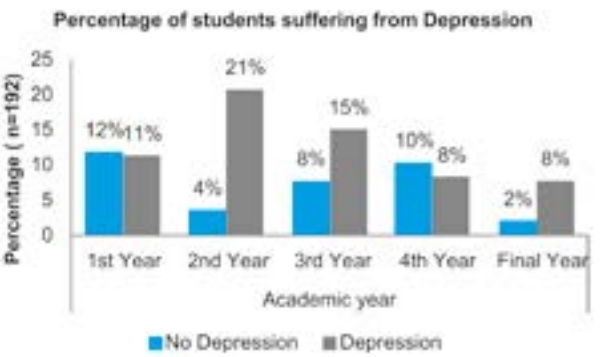

Figure-3. Percentage of students suffering from depression during all undergraduate medical years

Almost a quarter 26% (n=49) of students reported of having a family member who suffers

from terminal illness. A chi-square test of independence was performed to examine the relation between depression and terminal illness of a family member. The relation between these variables was highly significant, X^2 (1, n= 186) = 11.46, p= .001(Table-I). A Spearman's rank-order correlation was run to determine the relationship between depression and having a family member who is currently suffering from a terminal illness. There was a weak correlation between these variables r_s = .248, (n = 186, p = .001).

A little more than 58% (n=110) reported that the law and order situation of the country affects their daily mood. A chi-square test was also carried out to observe the relation between depression and the effect of law and order situation on daily mood of students. The relation between these variables was borderline significant, X^2 (1, n= 189) = 3.654, p= .056(Table-II). A substantial 49% (n=95) of students reported suffering from a feeling of insecurity when leaving home. This was independent of gender. An almost equal 46% (n=90) reported doubts about the security of their future in Pakistan.

A chi-square test was performed and no relationship was found between gender and depression X^2 (1, n= 190) = .267, p= .605. Similarly chi-square test also failed to establish any relationship between depression and relationship status of students X^2 (1, n= 182) = .448, p= .503(Table-II). The analysis was also unproductive in computing any relationship between: depression and residential status of students X^2 (1, n= 192) = .655, p= .418; depression and family structure X^2 (1, n= 192) = 2.887, p< .089; depression and family income X^2 (3, n= 185) = 1.860, p= .602; depression and family history of depression X^2 (1, n= 186) = .001, p= .975, depression and academic year (preclinical basic sciences students versus clinical sciences students) X^2 (1, n= 194) = 1.39, p= .237 and depression and recent near family member loss X^2 (1, n= 187) = 1.633, p= .201.

DISCUSSION

The prevalence of depression among undergraduate medical students of our setting was almost 63% (n= 122). This corresponds well with the reported 60% (n= 189) prevalence of the disease among the undergraduate students of medical colleges of private institutions of Pakistan as reported by Inam et al, although using a different measuring scale i.e. Aga

Characteristics		Depression		P value (p)
		No n (%)	Yes n (%)	
Gender (n= 190)	Male	27(14)	52(27)	0.605
	Female	42(22)	69(36)	
Academic year of undergraduate medical students (n= 191)	1st Year	23(12)	22(12)	0.000*
	2nd Year	7(4)	40(21)	
	3rd Year	15(8)	29(15)	
	4th Year	20(11)	16(8)	
	5th Year	4(2)	15(8)	
Relationship status (n= 182)	Single	61(34)	101(56)	0.503
	Committed	6(3)	14(8)	
Foreign citizenship (n= 186)	Yes	12(6)	5(3)	0.002*
	No	58(30)	116(61)	
Terminal illness of a family member (n= 186)	Yes	28(15)	21(11)	0.001*
	No	41(22)	96(52)	
Effect of law and order situation on daily mood (n= 186)	Yes	47(25)	63(33)	0.056
	No	23(12)	56(30)	

Table-II. Relationship of variables with Depression
*The Chi-square statistic is significant at .05 levels

Khan University Anxiety and Depression Scale (AKUADS).[9] Similar to this study, Inam et al also concluded significantly higher depression in 2nd year and 1st year students, 73% (n= 31) and 66% (n= 36) respectively as compared to 4th year and 3rd years students 49% (n= 18) and 47% (n= 18) respectively (p<0. 05).[9] The reported significant association by Inam et al was academic year (p <0.05).[9]

Khan et al reported that the prevalence of depression in a public institution of Karachi was 70% (n= 142) and the significant associations of depression among undergraduate medical students were substance abuse (p<0.001), family history of depression (p=0.001), death of relatives (p<0.001) and academic year particularly second (p=0.12).[13] Nazish et al used a modified General Health Questionnaire in 2013, and demonstrated evidence of distress in 52 % (n= 276) students.[8] While women in the general population have a higher life time risk of depression and anxiety than men do as argued by Dyrbye et al[4], the significant associations as assessed by Nazish et al were male gender (p<0.05), health related issues (p<0.05) and academic concerns (p= NA).[8]

Conversely, Alvi et al used Beck Depression Inventory and evaluated prevalence of depression in a similar to ours private setting to be 35% (n=98).[14] Age (p=0.013), gender (p=0.016), disappointment of examination criteria (p=0.002) and overburden with examination schedule (p=0.002) were significant associations with depression as argued by Alvi et al.[14] Albeit, depression was more common in second year medical students with a 43% (n=37) frequency.[14]

Even though Jadoon et al also calculated the prevalence of 44% (n=214) of depression in medical students using AKUADS in a public institution in Multan, the prevalence was highest 53% (n=51)among students of second academic year (p=0.028).[13] The authors argued that this higher prevalence of depression in initial academic years may well be due to the difference in teaching and assessment methodologies including introduction of problem based learning and objective structured performance evaluation in the recent years.[13]

In comparison with other international studies, Basnet et al (2012) used Zung Depression Scale in Dharan, Nepal in an autonomous institution and evaluated 30% (n=28) prevalence of depression[3] whereas, Coumaravelou Saravanan (2013) used Student Life Stress Inventory in a private institution in Malaysia and anticipated prevalence of depression to be 35% (n=125), both way too lower in comparison to Pakistan.[5]

LIMITATIONS

It can be argued that a relatively smaller sample (n=19) responded from final year which may affect some associations. The study only involved students from one private institution of Lahore. Caution should be used to generalize the study results as it lacked multicenter involvement. The respondents of the study belonged to a higher socioeconomic strata of the society. Therefore the lack of associations between income and depression cannot be rendered futile because the other spectrum of the socioeconomic strata was clearly not represented. Although the data collection continued for eight months i.e from March to October, some respondents who participated in later months can be pictured as already suffering from distress due to upcoming university exams in upcoming months.

CONCLUSION

There is a worldwide highest prevalence of depression among undergraduate private medical students of Pakistan. A large number of students suffering from depression use stimulants like amphetamines and caffeine. A substantial number of students suffer from a feeling of insecurity when leaving their homes. There is an association between depression at undergraduate medical years and having Pakistani citizenship. The prevalence of depression is highest among the students of second academic year. Terminal illness of a family member and effect of law and order situation of the country also compromise the mental health of undergraduate medical

students. It is recommended that adequate counseling facilities must be made available and students encouraged to seek help.[8] Further large, prospective, multicenter studies are needed to identify personal and training-related features that influence depression among students.[4] The introduction of problem based learning as a learning methodology may also be assessed against the conventional method as a source of distress in students particularly of the initial years.[13]

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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2	Dr. S. Tehseen Haider Kazmi		
3	Dr. Khadija Zafar Qureshi		
4	Dr. Kiran Wasiq	Proof reading and Editing	
5	Dr. Khadija Sajid	Data Collection Data Collection Data Collection	
6	Dr. Khyzer Butt	Data Collection	