

## ORIGINAL ARTICLE

**Predictive Relationship of Perceived Stressors and Mental Health of Medical Students**

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**ABSTRACT**

**Objective:** The objective of current study was to explore the predictive relationship of perceived stressors and its effects on the overall mental health of medical students.

**Study Design:** Cross-sectional study.

**Place and Duration of Study:** The study was carried out at three private sector medical colleges of Lahore, Pakistan from March 2019 to September 2019.

**Materials and Methods:** For assessment purpose indigenous scale "Perceived Stress Scale for Medical Students (PSSMS)" was used for assessment of stressors and "Depression Anxiety Stress Scale (DASS-21)" was used to evaluate the depression, anxiety and stress among medical students which gives an overall overview of mental health. The sample of 400 medical students was selected by stratified random sampling from different medical colleges of Lahore.

**Results:** Regression analysis revealed very significant predictive relationship of the total of "Perceived Stress Scale for Medical Students (PSSMS) with Total DASS [ $F(1, 398) = 77.14, p < .001$ ] and its subscales (Social stressors [ $F(1, 398) = 60.50, p < .001$ ], Mistrust [ $F(1, 398) = 31.32, p < .001$ ], Academic stressors [ $F(1, 398) = 36.50, p < .001$ ] and Burnout [ $F(1, 398) = 28.45, p < .001$ ]) to the DASS total score and individually on the subscales of depression, anxiety and stress at the level of ( $p < .001$ ).

**Conclusion:** The current study revealed that medical students are facing different types of stressors nowadays in Pakistan and these all stressors including social stressors, academic stressors, burnout and mistrust issues lead towards the mental health issues like anxiety and depression.

**Keywords:** Anxiety, Depression, Mental Health, Medical Students, Stress.

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**Introduction**

Medical education has been reported to be one of the toughest fields, which negatively effects physical and mental health of the medical students.<sup>1</sup> Undergraduate medical students' life is associated with the stressors like high parental expectations, peer pressure, examination fear, relationship disharmony, financial constraints, curriculum burden, and lack of communication with

administration and faculty of medical colleges.<sup>1,2</sup>

A large body of relevant literature supports that medical students face tremendous amount of stress leading to anxiety, depression and even suicidal tendencies. Psychological disorders are not uncommon in medical students, influencing their academic life and social life and one of the predicting factors to lead them towards drugs and alcohol use.<sup>3,4,5</sup> Around 30% medical students suffer from depression and anxiety<sup>6</sup>, similar pattern of findings was reported by a study from Brazil where 20% to 50% were reported with anxiety and depression.<sup>7,8</sup> In one study Lima et al reported prevalence of common mental disorders was 44.7% and these were relevant to the factors of social stress, academic performance stress, and lack of emotional and social support.<sup>9</sup> In Turkey, similar pattern was revealed in which 21.9% of students reported depression.<sup>10</sup> In one study

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conducted on Chinese medical students, findings revealed that nearly half of the medical students showed depressive symptoms with 2% having severe depression.<sup>11</sup>

Literature review from Pakistan identified high prevalence of depression and anxiety in medical students. One study conducted by Alvi et al in Wah Medical College revealed the prevalence of 47.7 % anxiety and 35.1% depression among medical students.<sup>12</sup> Analogous pattern of findings was explored in the city of Karachi in a public medical college with anxiety and depression among 70% of the students.<sup>13</sup> Jadoon and colleagues investigated prevalence of anxiety and depression in Nishtar Medical College, Multan, where the prevalence of anxiety and depression among students of first, second, third, fourth and final years was 45.86%, 52.58%, 47.14%, 28.75 % and 45.10% respectively.<sup>14</sup> All these findings were supported by research work of Hashmi et al who reported that , anxiety and depressive symptoms were present in 45.5% of medical students throughout the city of Karachi.<sup>15</sup> Research in Pakistan showed that medical students constitute a vulnerable group with a high prevalence of anxiety and depression.<sup>16,17</sup>

Stressors which predict psychiatric morbidity especially those responsible for increasing prevalence of anxiety and depression in medical students of Pakistan are academic pressure, lack of leisure time, competition for higher grades, tough academic and clinical schedules, fear of failure in modules and annual examinations, keeping attendance record on track, family history of anxiety and depression and financial indebtedness.<sup>12-15</sup> The rationale of the present study was to highlight the crucial need to deal with the medical students stressors in their daily lives especially in their academic domain because these stressors gradually leads them towards the other chronic mental health issues like anxiety, depression and in some cases even suicide. The major objective in the relevance of rationale of the current study was to explore the predictive relationship of stressors which were perceived by medical students of Pakistan with the stress, anxiety and depression.

### Materials and Methods

The cross-sectional study was conducted at three private sector medical colleges of Lahore, Pakistan

from March 2019 to September 2019 after obtaining the approval from the Institutional Ethical Review Board. The sample was selected through the stratified random sampling technique, which is probability sampling. Strata were made on the basis of gender and their year of study and from each strata participants were randomly selected by lottery method of randomization. With a lottery method, each member of the sample was assigned with a number, after which numbers were selected at random. The sample comprised of 400 participants (200 females and 200 males). From each year 80 participants were selected (40 males and 40 females). The age range of the participants was between 20 to 26 years. The sample size was based on the assertion made by Kline that indicated the ratio of sample must be at least 3:1 for the number of the items of scale.<sup>18</sup> The inclusion criterion for participants was student of private medical college, unmarried and in the age range of 20 to 26 years.

Demographic information was obtained through a proforma, for information relevant to the participant's age, gender, marital status, year of studies, birth order, residence and their monthly income.

Perceived stressors in medical students were measured by the "Perceived Stress Scale for Medical Students (PSSMS)"<sup>19</sup> by the means of four sub-scales of social stressors, mistrust, academic stressors, and burnout. Scale was coded with Likert scale of five choices from "strongly disagree" to "strongly agree". Cronbach's alpha for the (PSSM) items was 0.890. It has Cronbach's alpha values of 0.847, 0.773, 0.785 and 0.740 for the subscales of social stressors, mistrust, academic stressors and burnout respectively. Construct validity was supported through significant positive correlations with the Perceived Stress Scale (PSS) and Medical Student Stress Scale (MSSS). The details of these four subscales are given below:

- i. Social Stressors: The first factor labeled as "social stressors" because there are 13 items which describe interpersonal issues, social media issues, inferiority complex regarding social comparisons, and fear of negative evaluation from others.
- ii. Mistrust: The 10 items in this subscale assess mistrust relevant to social group, faculty,

- authorities of institute, and examination system.
- iii. Academic Stressors: These 10 items describe the stressors relevant to curriculum, frequent examinations, academic competition, fear of low grades, attendance deficiency, lack of time for personal life, uncertainty about future job and scope.
  - iv. Burnout: These 7 items in this subscale evaluate tendencies of burnout in medical students, including lack of interest in their professional field, use of passive coping strategies like drugs, uselessness of life, religion and medical profession.

Mental health was assessed by the Depression Anxiety Stress Scale (DASS) which measures the three related states of depression, anxiety and stress. DASS was developed by University of New South Wales in Australia.<sup>20</sup>The DASS-21 was found to have commendable psychometric properties. It is reliable, valid and easy to administer. It has 21 questions and takes about 3 minutes to complete. The reliability of DASS-21 showed that it has Cronbach's alpha values of 0.81, 0.89 and 0.78 for the subscales of depressive, anxiety and stress respectively. It has four-point Likert scale ranging from 0 to 1, the 0 means student believed the item "did not apply to me at all" and for 3 students believed that item "applied to me very much, or most of the time".

The study participants were collected from three private sector medical colleges in Lahore. Consent was taken from the authorities of these educational institutes and later informed consent was taken from the participants on the individual level during data collection. The demographic proforma, PSSMS, and DASS-21 were administered individually to each medical students of all five years. The Statistical Package for Social Sciences (SPSS, version 19.0) was used to analyze the data. The descriptive statistics was used for means, standard deviations and standard errors of the variables used in the current study. Linear regression analysis was performed for analysis of predictive relationship between perceived stressors and anxiety, depression, and stress.

**Results**

Out of 400 medical students, 200 (50%) were males and 200 (50%) were females. The study included 100

(25%) students each from the second-year to the final year medical students from the city of Lahore (Table 1). Table 2 shows the descriptive statistics including means, standard deviations and standard errors of the variables.

**Table 1: Distribution of Sample across gender and Year of Studies**

Year of MBBS	Male	Females
Second Year	50	50
Third Year	50	50
Fourth Year	50	50
Fifth Year	50	50
Total	200	200

**Table 2: Descriptive Statistics of Perceived Stress Scale for Medical Students (PSSMS) and Suicide Behavior Questionnaire Revised (SBQ-R)**

Scales	N	Range	Mean	S.E	S.D
PSSMS	400	123.0	122.3	1.04	21.68
Social-S	400	49.0	35.06	.473	9.47
Mistrust	400	49.0	36.17	.33	6.63
Academic -S	400	39.0	33.89	.37	7.51
Burnout	400	24.0	17.23	.25	5.12
DASS	400	118.0	48.9	1.38	27.6
Depression	400	25.0	8.26	.28	5.17
Anxiety	400	20.0	7.35	.23	4.77
Stress	400	24.0	9.11	.25	5.77

Note: PSSMS (Perceived Stress Scale for Medical Students); Social-S (Social Stressors); Academic S (Academic Stressors). N=400

LL=lower limit, UL=Upper limit, S.E=Standard error S.D=Standard Deviation.

Results in Table 3 show that the total scores of PSSMS positively predict DASS total scores. The  $R^2$  value of 0.13 indicates that 17 % variance in the dependent variable which is DASS can be accounted for, by the predictor which is PSSMS total with ( $F=77.14, p<0.001$ ). PSSMS has significant positive effect on DASS ( $\beta= .40, p<0.001$ ). Similarly Social stressors positively predicts DASS with ( $F=60.50, p<0.001$ ). Social stressors have significant positive effect on DASS ( $\beta= 0.36, p<0.001$ ). Similar pattern was observed that Academic stressors ( $F=36.50, p<0.001$ ) with positive effect of ( $\beta= 0.29, p<0.001$ ), Mistrust with ( $F=31.38, p<0.001$ ) with positive effect of ( $\beta= 0.27, p<0.001$ ) and Burnout with ( $F=28.45, p<0.001$ ) with positive effect of ( $\beta= .25, p<.001$ ) on total Depression Anxiety Stress Scale scores. After linear regression analysis of total scores of DASS with PSSMS and its subscales further regression analyses

were performed to highlight the predictive relationship of PSSMS and subscales to DASS subscales of depression, anxiety and stress. Results revealed PSSMS has significant positive effect on Depression ( $\beta=0.38, p<0.001$ ). Similarly, social stressors positively predict depression with ( $F=62.02, p<0.001$ ). Social stressors have significant positive effect on depression ( $\beta= 0.36, p<0.001$ ). Similar pattern was observed that academic stressors ( $F=29.40, p<0.001$ ) with positive effect of ( $\beta=0.26, p<0.001$ ), mistrust with ( $F=21.61, p<0.001$ ) with positive effect of ( $\beta= 0.27, p<0.001$ ) and burnout with ( $F=29.59, p<0.001$ ) with positive effect of ( $\beta=0.26, p<0.001$ ) on depression.

Similar pattern was showed in linear regression of anxiety as dependent variable. Results revealed PSSMS has significant positive effect on anxiety ( $\beta= .38, p<.001$ ). Similar pattern was observed that social stressors ( $\beta=0.27, p<0.001$ ), academic stressors ( $\beta=0.26, p<0.001$ ), mistrust ( $\beta= .27, p<0.001$ ) and burnout ( $\beta=0.26, p<0.001$ ) have significant positive effect on anxiety. Analogous pattern was revealed in linear regression with stress as a dependent variable. Results revealed PSSMS has significant positive effect on stress ( $\beta= .34, p<.001$ ). Similar pattern was observed that social stressors ( $\beta=0.30, p<0.001$ ), academic stressors ( $\beta= .24, p<.001$ ), mistrust ( $\beta= 0.27, p<0.001$ ) and Burnout ( $\beta=0.18, p<0.001$ ) has significant positive effect on anxiety. All these statistical analyses highlight that perceived stressors by medical students which they face daily during their education in medical colleges of Lahore positively predicts the students' mental health including depression, anxiety and depression (Table 3).

## Discussion

Depression, anxiety and stress are common mental health issues, seen in the general population. Undergraduate medical studies are generally perceived to be more stressful for the students as compared to the other graduate programs relevant to other fields. Medical education poses stress to the students because of vigorous curriculum and intensive evaluation system which leads students towards psychiatric disorders like anxiety and depression. In Pakistan, a lot of research literature is available on the high prevalence of anxiety and

depression in medical students. The focus of the current research was to explore the predictive relationship of all those perceived stressors of the medical students and their mental health issues. The scale Perceived Stress Scale for Medical Students (PSSMS) used for assessment of stressors was an indigenous tool and the objective of the study was investigate the influence of these perceived stressors on the psychiatric problems of medical students.

The findings shown in Table 3 reveal that there was a highly significant predictive relationship of the total score of PSSMS and its subscales of social stressors, academic stressors, mistrust and burnout with DASS-21 total and all its subscales of depression, anxiety and stress in medical students. Analogous pattern of findings was revealed (Table 3). Results showed highly significant predictive relationship of all subscales (social stressors, mistrust, academic stress, and burnout) of PSSMS with DASS-21 total and its subscales.

Previous studies on the global as well on the local level indicate that high level of stress increases the probability for the development of mental health issues.<sup>17,5</sup> These psychiatric issues especially depression makes students vulnerable for suicide. Since the last year, there has been a rapid increase in incidence of suicide in medical students in Pakistan. This alarming increase in suicide, points towards an urgent need to look in to the issue systematically and analyze the factors contributing to it.<sup>2</sup>

Stressors perceived by medical students have been linked to negative consequences on mental health and as well as physical health of student. High stress triggers burnout, sleep disturbances, and deterioration of academic and clinical performance among medical students. In the current study, social stressors included fear of negative evaluation from others especially peer-group, inferiority complex regarding social competency and popularity in social circles, effectiveness and admiration on social media. All these social stressors were highly predictive for the anxiety, depression and stress detected among medical students. McKenzie et al reported similar patterns of findings that lack of emotional support, finding difficulty in making friends, and communication networks issues were prominent stressors among students.<sup>21</sup>

Second stressor was mistrust that leads towards the

**Table 3 : Linear Regression Analysis showing PSSMS total, Social stressors, Academic stressors, Mistrust, and Burnout as the predictors of DASS total and its sub-scales of Depression, Anxiety and Stress (N=400)**

Predictors	Dependent variables	Model	R <sup>2</sup>	b	SE	β	t	p	
PSSMS-T	DASS-T	Constant	.13	-13.87	7.26		-1.91	.005	
		PSSMS		.513	.05	.40	8.78	.000	
	Depression	Constant	.09	-4.21	1.53		-2.53	.000	
		PSSMS		.102	.01	.38	8.27	.000	
	Anxiety	Constant	.09	-2.16	1.29		-1.67	.009	
		PSSMS		.078	.01	.35	7.49	.000	
Stress	Constant	.13	-.99	1.39		.71	.474		
	PSSMS		.08	.01	.34	7.37	.000		
Social Stressors	DASS-T	Constant	.13	11.8	4.94		2.39	.001	
		Soc-S		1.05	.13	.36	7.77	.000	
	Depression	Constant	.13	.41	1.03		.40	.68	
		Soc-S		.22	.02	.36	7.8	.000	
	Anxiety	Constant	.09	1.94	.87		2.21	.02	
		Soc-S		.15	.02	.30	6.38	.000	
	Stress	Constant	.09	3.23	.94		3.42	.000	
		Soc-S		.16	.02	.30	6.45	.000	
	Academic Stressors	DASS-T	Constant	.08	12.80	6.12		2.09	.003
			Acad-S		1.06	.17	.29	6.04	.000
		Depression	Constant	.06	1.42	1.29		1.10	.26
			Acad-S		.20	.03	.26	5.42	.000
Anxiety		Constant	.07	1.31	1.06		1.23	.22	
		Acad-S		.17	.03	.27	5.79	.000	
Stress	Constant	.06	3.38	1.16		2.91	.000		
	Acad-S		.16	.03	.24	5.50	.000		
Mistrust	DASS-T	Constant	.07	8.23	7.38		1.11	.26	
		Mistrust		1.12	.20	.27	5.59	.000	
	Depression	Constant	.05	1.11	1.56		.71	.47	
		Mistrust		.19	.04	.22	4.64	.000	
	Anxiety	Constant	.05	1.38	1.29		1.06	.28	
		Mistrust		.16	.03	.22	4.67	.000	
Stress	Constant	.07	1.51	1.38		1.09	.27		
	Mistrust		.21	.03	.27	5.58	.000		
Burnout	DASS-T	Constant	.06	24.9	4.68		5.32	.000	
		Burnout		1.39	.26	.25	5.33	.001	
	Depression	Constant	.06	3.15	.97		3.22	.000	
		Burnout		.29	.05	.26	5.44	.000	
	Anxiety	Constant	.04	3.82	.82		4.65	.000	
		Burnout		.20	.04	.21	4.47	.000	
Stress	Constant	.03	5.84	.89		6.55	.000		
	Burnout		.19	.05	.18	3.82	.000		

Note: PSSMS=Perceived Stress Scale of Medical Students; DASS-T=Depression Anxiety Stress Scales-Total scores; Acad S=Academic Stress; Soc S=Social Stress). \*\*P< .000

mental health issues. Mistrust of medical students relevant to administration of medical colleges, biased attitude of teachers, incompetent and old teaching styles, unfair examination evaluation and mistrust towards the colleagues as students perceive most of their colleagues materialistic. Third factor was academic stress including fear of failure in examinations, chaotic academic and clinical

schedules, and lack of leisure time.<sup>22</sup> Medical education in Pakistan is basically based on traditional teaching styles and both written and oral exams. Failure in exams leads to reappearance in supplementary exams and again failure in it leads students to the repetition of a whole year. Failure in exams is the highest degree of academic stress in medical students.<sup>15</sup> Additionally students were

stressed in their final years about their job opportunities and scope for further studies.<sup>2</sup> The last factor was burnout including losing interest in medical profession, in life and religion. All these factors play a crucial role in the high morbidity of psychiatric disorders in students.

The sample engaged in this study was restricted to the private sector medical colleges. It is suggested for further research to include public sector medical colleges and data must be collected from the other cities of Pakistan. Follow up studies with different moderating and mediating variables will help in instituting interventional strategies.

### Conclusion

In conclusion, this study showed that perceived stressors including academic stressors, social stressors, mistrust feelings and burnout tendencies lead students to different mental health issues as assessed in current study by depression, anxiety and stress.<sup>22-24</sup> It is highly recommended that medical schools should take preventive measures to address these issues. At the very least, all students should have access to a mental health professionals with whom they may discuss their problems and who screen out the vulnerable students, who need psychiatric intervention in the form of psychotherapy or medication.<sup>15,25</sup> Training workshops and sessions of the students relevant to effective coping strategies will be beneficial in this domain. Medical students should be encouraged to spend adequate time on their social and personal lives. Sports and recreational activities must be facilitated at the campus area.<sup>14</sup> College administration should facilitate communication with students and be aware about the needs and concerns of students. Mentors enrolled should be sincere and willing to help students especially they should be trained to detect the early signs of anxiety and depression in students. The medical graduates should get exposure to the good career counseling sessions relevant to their concerns about choice of specialty in future and job choices. Importantly, the role of family is very crucial in this scenario as good family bonding is essential for adequate stress management and the development of resilience. All these strategies might make a difference and play a role of buffer against mental health issues in medical students.<sup>2</sup>

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