ORIGINAL ARTICLE

Medical School and Stress: A Cross-sectional Study of Stress among Medical Students in Uttar Pradesh University of Medical Sciences in district Etawah

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| Abstract | Introduction | Methodology | Results | Conclusion | References | Citation | Tables / Figures |

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Citation

Article Cycle

Abstract

Background: Medical education has come long way since the era of Hippocrates. It is progressively evolving into a more organized and complicated system. All over the world, Medical education is criticized as one of the most demanding and stressful academics, showing effects on physical and mental health of medical students. This research was conducted to study stress and its factors in students of UPUMS, Saifai, Etawah, Uttar Pradesh**. Aim & Objectives**: To estimate the prevalence of stress among medical students of UPUMS. To estimate internal consistency of Medical Students Stress Questionnaire (MSSQ-40). **Material & Methods**: A Cross-sectional study was carried out during Oct. 2017 - Mar. 2018 among MBBS Students of all academic years in Uttar Pradesh University of Medical Sciences (UPUMS), Saifai. All the students enrolled in the university available on the day of data collection were recruited in the study. MSSQ-40 was the study tool to assess stress. Ethical clearance was obtained from Ethical Committee. Statistical analysis done in SPSS-23. **Results:** The mean age of subjects was 22.4±2.3 years, more than 84% of the respondents had moderate and high stress. More number of females perceived stress than the male, 33% female were suffering from high & severe stress. statistically significant. **Conclusion**: Gender & grades had clear association with stress, academics & interpersonal relation caused more stress. Early detection and effective intervention can prevent future illness among medical students.

Keywords

Stress; Medical students; reliability

Introduction

Medical education has come long way since Hippocratic era. Worldwide, Medical education is criticized as one of the most demanding and stressful academics.(1) Medical colleges are held responsible for quality of education provided and to ensure that students have ample knowledge and skill prior to

establish themselves as health care professionals. Aiming for upgradation of individual skills, medical colleges typically schedule series long of lectures, clinical postings and demonstrations. Unfortunately, training in medical profession has inadvertent consequences on the physical and mental health of students.(2)

Prolonged stress may lead to unintended consequences on health, academics, proficiency and civility. Other consequences like fear, depression, uselessness, incompetence and other negative feelings have also been reported. Suicides and attempt to suicides are also reported as matter of issue in Indian medical schools.(1,2,3,4)

More than 50% of medical students have reported problems due to stress.(5-8) There is dire need to focus on mental health of medical students, as it may prejudice the ability of learning that may conclusively affect the quality of health care they provide in future. Stress in medical school remains a less prioritized research topic, especially in rural institutes. This study was carried to study stress & its factors among MBBS students in Uttar Pradesh University of Medical Sciences(UPUMS).

Aims & Objectives

- To estimate prevalence of stress among undergraduate medical students of UPUMS, Saifai in district Etawah.
- To study the factors leading to stress among the medical students.
- To study association of stress with gender and year of study in medical school.
- To estimate the internal consistency of Medical Students Stress Questionnaire (MSSQ-40).

Material & Methods

Study Design: A Cross-sectional study. Study Subjects: Medical Students of all academic years. Study Setting: Uttar Pradesh University of Medical Sciences (UPUMS), Saifai, is a government medical institute situated in rural Etawah established in 2006. At present 150 MBBS students take admission in each academic year. Students included in study belonged to admission year 2013 to 2016. **Study Duration:** October, 2017 to March, 2018 (6 Months).
Study Sample: All the students enrolled in the university and available on the day of data collection were recruited as respondents for the study. We had tried to cover the missing students with two revisits in the same week.

Tools of the study: Stress and its factors were evaluated using a validated questionnaire known as Medical Students Stressor Questionnaire-40 (MSSQ-40) developed by Md. Saiful, B Yusoff & Ahmad Faud Abdul Rahim, Malaysia. The MSSQ-40 was developed to assess intensity of stress, stressors in medical student's life has been classified into six domains viz. Academic related stressors, Interpersonal and intrapersonal related stressors, Teaching and learning related stressors, Social related stressors, Drive and desire related stressors, Group activities related stressors. Each statement is scored by student by their experience and perspective from 0 to 4. Average score of statements under a particular domain of 1.01 to 2.00 is considered as moderate stress, whereas 2.01 to 3.00 is said to have high stress. (9)

The questionnaire was obtained with authors permission for research purpose.

Inclusion criteria: All MBBS students from first year to final year.

Exclusion Criteria: Students who did not give consent for study, Students who couldn't be contacted on repeated visit, Newer batch students were excluded because they were admitted just 1 month back from the day of start of study, Students undergoing Internship were excluded.

Ethical Consideration: Ethical clearance was taken from the Ethical Committee of the University before starting the study

Methodology: Medical Students of all the academic batches were approached in the Lecture hall with a pre-designed & pre-structured questionnaire without disturbing their academic classes. Prior to distribution of questionnaire, they were sensitized to the type of questions being asked and clarification was given regarding doubts about questions. Medical Students Stress Questionnaire (MSSQ-40) were filled by students after briefly explaining the purpose of the study. The questionnaire consists information about the socio-demographic profile and 40 statements for which students had to grade their stress experienced for that particular statement in medical school. The participation in the study was purely on a voluntary basis, students were given an opportunity to quit the study at any point of time during the study. Anonymity and confidentiality were assured and written consent was taken from students.

Statistical Analysis: The data collected by above method was encoded and entered in MS Excel

worksheets and analyzed using IBM SPSS Version 23. The questionnaires with missing data were omitted from the analysis. Results were presented in graphs and tables. Data was presented as percentage, mean and standard deviation. Association between stress versus gender and year of study was studied using chi-square test. A p value of less than 0.05 was assumed to be significant. Internal consistency of MSSQ-40 was estimated by calculating Cronbach's alpha.

Results

Out of 480 students, 40 students didn't consent for the study and 9 forms were not filled completely. A total of 440 students participated in the research, after omitting missed data 431 questionnaires were considered for data analysis. Majority of the respondents i.e. 126 students (29 %) were from 3rd year, while 87 (20%) students from first-year participated in the study. Sixty-one percent of the study subjects were male and 37% of the study subjects studied in Hindi medium before entering MBBS. The mean age of participated respondents was 22.4±2.36 years (Figure 1,2,3).

All the respondents reported at least some degree of overall stress. Study subjects showing mean score above 1 – i.e. those respondents reported moderate and high and severe stress were considered to be under stress.

The prevalence of stress among the study subjects for Mild, Moderate and High was estimated to be 16%, 57% and 27% respectively (Figure 4). The average score of overall stress was 1.52 ± 0.58, while more than 84% of the students had moderate or high stress.

Academic stressor was the major cause of stress among undergraduate medical students. Forty-six percent of the students showed high and severe academic stress, 43 % of students showed moderate degree of stress in academics, whereas all other stressors constituted stress for 15-25% of students. More than 3/4th (82%) have moderate to high academic related stress, followed by 70-72% students having teaching, learning and social related stress (Table.1).

Female students i.e. 151 out of 170 (89%) perceived more stress than the male students since they have entered medical school. On the other part, 212 out of 261 (81%) male students showed moderate or high stress. Thirty-three percent female students were suffering from high & severe stress which was

more when compared to male students (23%), this difference of stress was found statistically significant. (p<0.05). Maximum i.e. 56% female students had high & severe academic stress, where maximum male students i.e. 47% of the respondents had moderate academic stress and this variation of was statistically significant, p=0.002 (Table. 2).

Interpersonal and Intrapersonal related stressor: High & severe IRS was reported in 25% of the medical students. Maximum i.e. 42% of students had moderate IRS, High stress was more in female undergraduate students (37%), in comparison to their male counterparts (17%) this variation was observed to be statistically significant (p<0.001) depicting that females had more stress related to IRS than that of male undergraduate students (Table.1 & Table 2).

Teaching and Learning Related Stressors: moderate amount of stress was experienced by 49% of student related to TLRS. The difference between male and female students did not vary much among TLRS and the difference was found statistically non-significant (p=0.31). No association was found between gender and severity of TLRS (Table.1 & Table 2).

Drive Related Stressors: maximum i.e. 54% students had moderate stressor related to drive, 20.6% of female students had severe drive related stress when compared to male students (16%). This difference was found to be statistically non-significant (p=0.52) (Table.1 & Table 2).

Group Related Stressors: GRS was the least stress-inducing factor among medical students when compared to other stressors. Maximum i.e. 35% of the undergraduate students showed moderate stress and the association between gender and severity of stress was found statistically non-significant, p=0.65 (Table.1 & Table 2).

Social Related Stressors: Forty-six percent of undergraduate medical students had moderate stress. High stress was similar in both the genders, 52% of females and 42% of male students had moderate stress and the association of gender versus severity of stress found to be statistically non-significant (p=0.07) (Table.1 & Table 2).

Table 3 presents variation of degree of stress among different grades of under graduation. Overall stress was observed to be more among 3rd and 4th year students i.e. 27.8% and 39% respectively, this association of stress with year of students was observed to be statistically significant (p<0.001).

All the six domains showed an increase in stress among 3rd and 4th year students when compared to 1st and 2nd year students. The association of grades and severity of stress and grade was found to be statistically significant (p<0.05) in all the six domains (Table. 3).

The reliability of MSSQ - 40, the Cronbach's alpha value was estimated to be 0.92. ARS domain's reliability was found to be 0.83, followed by all other domains IRS, TLRS, DRS, GRS, SRS which ranged from 0.5 to 0.7 (Table 4).

Correlation between all the items (domains) and the overall score was >0.5, except GRS. TLRS and DRS, when correlated with ARS, the correlation coefficient was >0.5. All other inter item correlation was found to be <0.5. depicting a good correlation between overall scale and their domains.

Discussion

Medical education has always been criticised as a highly competitive and stressful educational system. Studies have reported an unusually increased proportion of stress among medical students, diversified with the range of 25% to 75%.(1-4,10-13) Our study included students from all the grades of MBBS, 61% of respondents were male and 37% had been from Hindi Medium. The combined prevalence of stress in our study was 84% among them, 57% of students were moderately stressed, 27% of the students were highly stressed after entering into the medical field, similar to other studies reported. (1,3,4,10,11) Overall stress was more among students of 3rd & 4th year students when compared to students of 1st & 2nd year, this may be because of inability to cope up with academic, interpersonal or various other domains. Various other studies conducted by Eva Eo *et al*, Habeeb KA *et al*, Yusuff MSB *et al* have also found similar results of increased perseverance of stress among 3rd & 4th year students.(2,13,14) A study by Melaku L *et al* reported increased stress in first two years of medical education contradicts this study findings, this variation may be because of difference in curriculum and education settings.15 More number of female students (88.2%) perceived stress compared to male students (81.2%), as similar to other studies (1,2) whereas Saxena Y *et al*3 reported that females exhibit less stress than males, this difference may be because their study included only 1st year students. Melaku L *et al* and Abdulghani HM *et al* also reported more number of females perceived stress in comparison to males. (15,16)

Hindi medium background didn't show any statistically significant variation in stress. The levels of stress in gender was also observed to be statistically significant in all six domains. Female students reported more stress in ARS, IRS, SRS, & DRS. Conversely, male students perceived more stress in TLRS, GRS.

While considering the domains of the MSSQ-40 scale, ARS & IRS were major cause of stress followed by other stressors. Academics related stressor was perceived as highly stressful by 46% of the under graduate medical students. Most of the studies have also shown the similar result for ARS like 'Tests/ examinations', 'Getting less marks', 'Huge syllabus to be learnt', and 'Finding difficulty in understanding the content' as a leading stressor. Surwase K *et al* reported average score of 2.96 ± 0.70, which was more than any other domains.1 Saxena Y *et al* reported more than 50% of students showed moderate stress in academics.(3) Association of American Medical colleges also reported academics as important leading stressor,5 various other authors like Yee LY *et al*, Habeeb KA *et al*, Siraj HH *et al* also supported this finding. (12,13,15,16,17)

The questionnaire MSSQ 40 was found to be reliable in Indian setting to measure stress with a high Cronbach's alpha (0.7) for the overall scale including 40 items.(11) ARS, IRS, TLRS domains were also observed to be reliable. Gupta S *et al* (4) has also similar findings in their study showing all domains reliability >0.7 except SRS & DRS. In our study DRS, SRS, GRS reliability was around 0.5. Othman CN *et al* (11) found all the domain's Cronbach's alpha value was more than 0.7, especially IRS was more reliable (0.9)

Conclusion

Stress is a crucial health problem among the medical students. More than half of the undergraduate medical students were moderately stressed and more than one fourth were highly stressed. Academic, teaching, social and group related stressors were the main forms of stressors. More number of female students perceived stress in comparison to male students. Under graduate students of 3rd & 4th year were more stressed compared to 1st & 2nd year students. MSSQ-40 is a reliable scale in measuring the stress perceived by the medical students. Constant exposure to stressful

situation leads inadvertent effects on the mental and physical well-being of medical students. Early detection and effective intervention may prevent probable future illness among medical students. The observations of the present study will provide baseline data for a future detailed prospective study

Recommendation

Academic decision makers should consider the issue of stress in medical school and stress as an important aspect and monitor students to ensure early identification and management of stress.

Periodic assessment of mental health by screening students should be inculcated in curriculum, establishment of counselling sessions, regular follow-up of the identified students reduces incidence of psychological disorders.

Stress management strategies like promoting yoga, physical exercises should be incorporated. Encouraging extracurricular activities may help students to overcome the problem.

Feedback evaluation from students about teaching, group activities, curricular and extracurricular activities would be helpful in understanding the perspectives and for implementation of solutions.

Limitation of the study

A cross sectional study with sample from only one institute limits its generalizability. A multi-centric longitudinal study would yield more specific results.

Relevance of the study

Stress in medical students is a less prioritized topic, literature shows limited evidences. The study findings add to the available evidences and a baseline for further multi-centric researches. The findings also help in decision making for relevant authorities.

Authors Contribution

KK: concept, design, data collection, analysis and interpretation of data, literature search, drafting. NPS: concept, design, analysis and interpretation of data and critical revision of manuscript. PKJ: interpretation of data, drafting and critical review of final manuscript. AS: literature search, drafting and review of manuscript. JM: data collection, literature search and drafting. KSN: data collection, analysis and drafting.

Acknowledgement

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Tables

TABLE 1 PREVALENCE OF DEGREE OF STRESS IN VARIOUS DOMAINS AMONG RESPONDENTS. (N=431)

	Overall stress n(%)	ARS n(%)	IRS n(%)	TLRS n(%)	DRS n(%)	GRS n(%)	SRS n(%)
Mild	68 (15.8)	45 (10.4)	141 (32.7)	119 (27.6)	116 (26.9)	214 (49.7)	136 (31.6)
Moderate	246 (57.1)	187 (43.4)	182 (42.2)	211 (49.0)	236 (54.8)	151 (35.0)	197 (45.7)
High	117 (27.1)	199 (46.2)	108 (25.1)	101 (23.4)	79 (18.3)	66 (15.3)	98 (22.7)
Total	431 (100)	431 (100)	431 (100)	431 (100)	431 (100)	431 (100)	431 (100)

TABLE 2 ASSOCIATION OF GENDER AND STRESS IN VARIOUS DOMAINS. (N=431)

Gender	Mild n (%)	Moderate n(%)	High n(%)	Level of significance
Overall Stress				$\chi^2=7.309$ df-2 p=0.026
Female	19(11.2)	95(55.9)	56(32.9)	
Male	49(18.8)	151(57.9)	61(23.4)	
Total	68 (16)	246 (57)	117 (27)	
Academic related stress (ARS)				$\chi^2=12.104$ df-2 p=0.002
Female	11(6.5)	64(37.6)	95(55.9)	
Male	34(13)	123(47.1)	104(39.8)	
Total	45 (10)	187 (44)	199 (46)	
Interpersonal related stress				$\chi^2=25.76$ df-2 p<0.001
Female	40(23.5)	66(38.8)	64(37.6)	
Male	101(38.7)	116(44.4)	44(16.9)	
Total	141 (33)	182 (42)	108 (25)	
Teaching & learning related stress				$\chi^2=2.293$ df-2 p=0.318
Female	53(31.2)	82(48.2)	35(20.6)	
Male	66(25.3)	129(49.4)	66(25.3)	
Total	119 (28)	211 (49)	101 (23)	
Social related stress				$\chi^2=5.134$ df-2 p=0.077
Female	44(25.9)	88(51.8)	38(22.4)	
Male	92(35.2)	109(41.8)	60(23.0)	
Total	136 (31)	197 (46)	98 (23)	
Drive & Desire related stress				$\chi^2=1.290$ df-2 p=0.525
Female	42(24.7)	93(54.7)	35(20.6)	
Male	74(28.4)	143(54.8)	44(16.9)	
Total	116 (27)	236 (55)	79 (18)	
Group activities related stress				$\chi^2=0.856$ df-2 p=0.652
Female	89(52.4)	57(33.5)	24(14.1)	
Male	125(47.9)	94(36.0)	42(16.1)	
Total	214 (50)	151 (35)	66 (15)	

TABLE 3 GRADE WISE STRESS IN ALL THE DOMAINS. (N=431)

Overall Stress	Mild	Moderate	High	Level of significance
MBBS 4th year	11(10.5)	53(50.5)	41(39.0)	χ2=41.76
MBBS 3rd year	15(11.9)	76(60.3)	35(27.8)	df-2
MBBS 2nd year	11(9.7)	77(68.1)	25(22.1)	P<0.0001
MBBS 1st year	31(35.6)	40(46)	16(18.4)	
Total	68 (16)	246 (57)	117 (27)	
Academic related stress (ARS)				
4th year	5 (4.8)	40 (3.5)	60 (57.1)	χ2=55.8
3rd year	10 (7.9)	53 (42)	63 (50)	df-6
2nd year	4 (3.5)	66 (58.4)	43 (38)	P=<0.001
1st year	26 (29.9)	28 (32.2)	33 (37.9)	
Total	45 (10.4)	187 (43.4)	199 (46.2)	
Interpersonal related stress (IRS)				
4th year	26 (24.8)	40 (38)	39 (37.1)	χ2=27.15
3rd year	49 (38.9)	54 (42.8)	23 (18.3)	df-6
2nd year	25 (22.1)	59 (52.2)	29 (25.6)	P<0.001
1st year	41 (47.1)	29 (33.3)	17 (19.4)	
Total	141 (32.7)	182 (42.2)	108 (25.1)	
Teaching & learning related stress (TLRS)				
4th year	21 (20)	58 (55.2)	26 (24.8)	χ2= 13.71
3rd year	33 (26.2)	56 (44.4)	37 (29.4)	df-6
2nd year	30 (26.5)	60 (53)	23 (20.3)	P=0.033
1st year	35 (40.2)	37 (42.5)	15 (17.2)	
Total	119 (27.6)	211 (49)	101 (23.4)	
Social related stress (SRS)				
4th year	22 (23)	51 (48.6)	32 (30.5)	χ2=22.7
3rd year	42 (33.3)	55 (43.6)	29 (23)	df-6
2nd year	29 (25.7)	60 (53.1)	24 (21.2)	P=0.001
1st year	43 (49.4)	31 (35.6)	13 (15)	
Total	136 (31.6)	197 (45.7)	98 (22.7)	
Drive & Desire related stress (DRS)				
4th year	22 (21)	60 (57.1)	23 (22)	χ2=12.8
3rd year	32 (25.4)	73 (58)	21 (16.7)	df-6
2nd year	26 (23)	65 (57.5)	22 (20)	P=0.045
1st year	36 (41.4)	38 (43.7)	13 (14.9)	
Total	116 (27)	236 (54.7)	79 (18.3)	
Group activities related stress (GRS)				
4th year	36 (34.3)	41 (39)	28 (26.7)	χ2=26
3rd year	59 (46.8)	46 (36.5)	21 (16.7)	df-6
2nd year	63 (55.7)	39 (34.5)	11 (9.7)	P<0.001
1st year	56 (64.4)	25 (28.7)	6 (6.9)	
Total	214 (49.7)	151 (35)	66 (15.3)	

TABLE 4 INTERNAL CONSISTENCY OF MEDICAL STUDENTS STRESS QUESTIONNAIRE-40

Items	Cronbach's α
Overall MSSQ scale	0.924
ARS	0.838
IRS	0.775
TLRS	0.743
DRS	0.598
GRS	0.507
SRS	0.553

TABLE 5 INTER ITEM CORRELATION OF DOMAINS OF MSSQ -40

|	ARS	IRS	TLRS	DRS	GRS	SRS	Overall Score (Mean)
ARS	1.000						
IRS	0.476	1.000					
TLRS	0.567	0.424	1.000				
DRS	0.526	0.488	0.519	1.000			
GRS	0.341	0.297	0.369	0.330	1.000		
SRS	0.487	0.462	0.495	0.465	0.330	1.000	
Overall Score (Mean)	0.768	0.641	0.681	0.686	0.458	0.616	1.000

Figures

FIGURE 1 GRADE WISE DISTRIBUTION OF STUDY SUBJECTS (N=431)
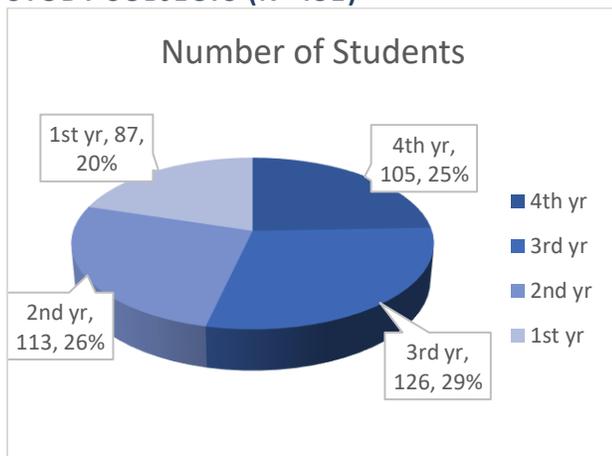
FIGURE 3 DISTRIBUTION OF RESPONDENTS WITH HINDI MEDIUM BACKGROUND. (N=431)
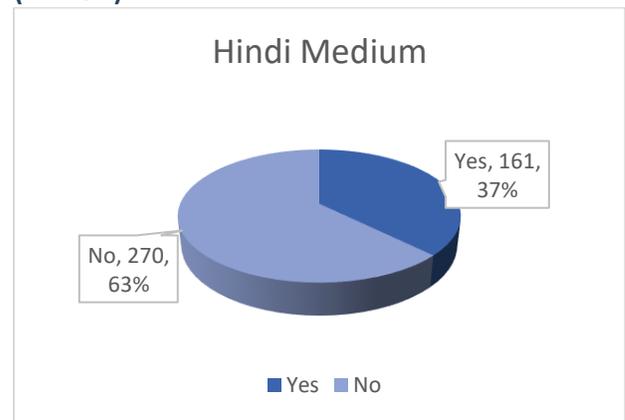
FIGURE 2 GENDER WISE DISTRIBUTION OF STUDY SUBJECTS. (N=431)
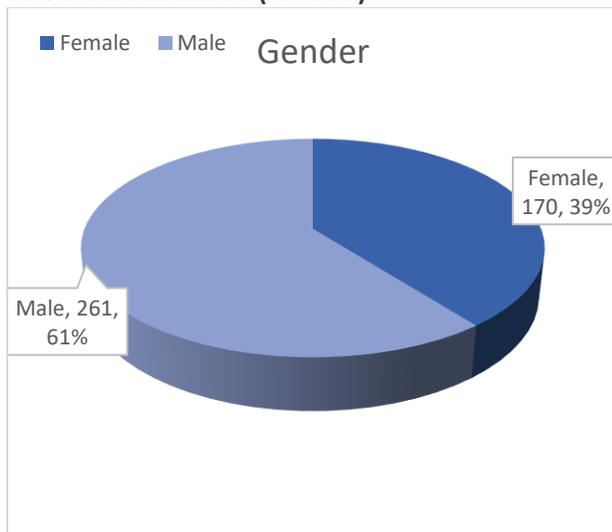
FIGURE 4 DISTRIBUTION OF LEVELS OF STRESS AMONG THE STUDY SUBJECTS. (N=431)