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Stress Among Undergraduate Medical Students in a Medical College of Nepal

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ABSTRACT

Introduction: Medical education imposes significant stress on students, affecting their psychosocial well-being and academic performance. However, the stressor and its impact vary from person to person.

Objectives: To assess stress level and its association with years of medical education

Methodology: This was a cross-sectional study conducted in medical students at Birat Medical College Teaching Hospital. Demographic and academic details were collected using semi-structured proforma. The Medical Student Stressor Questionnaire was used to assess Academic Related Stressor (ARS), Intrapersonal and Interpersonal related stressor (IRS), Teaching and Learning Related Stressor (TLRS), Social Related Stressor (SRS), Drive and Desire Related Stressor (DRS) and Group Activities Related Stressor (GARS).

Results: A total of 324 students were enrolled in the study out of which 181(55.86%) were males and 143 (44.14%) were females. The age of the participants ranged from 18 to 27 years (Mean = 22.05 years, SD = 1.8). Majority of participants were from first year (29%) followed by second year (21.6%). About 47% of the participants had high level of ARS, 63.27% participants had moderate level IRS, 51.23% participants had moderate level TLRS, 56.79% participants had moderate level SRS, 46.9% participants had moderate level DRS whereas 42.28% participants had mild level of DRS. Significant association was found among different domains of stressors and years of medical education.

Conclusion: Results from our study showed that all the students had some form of stress ranging from mild to severe. This emphasizes on providing mental health support to medical students.

INTRODUCTION

Medical education is indeed a demanding and extensive field that places a significant burden on medical students. The pursuit of a medical career requires students to acquire a vast amount of knowledge and develop a wide range of skills before taking on professional responsibilities.¹ Studies have shown that medical students often experience poorer psychosocial well-being compared to their peers of the same age. They also exhibit higher rates of depression and burnout when compared to the general population. These challenges are attributed, in large part, to the intense workload and expectations placed on medical students throughout their education and training.² The impact of stress on medical students varies from person to person, some individuals may thrive under pressure, while others may struggle with its negative effects.^{3,4} Elevated stress affects physiological and psychological well-being and causes a decline in academic performance. Studies have shown that high levels of stress affect the cognitive functioning of medical students, impacting their ability to learn.⁵ Excessive stress is also seen to be linked with medical students suicide.⁶ Furthermore, chronic stress results in structural brain changes causing negative impact on cognitive function.^{7,8} A

study done on medical students at Siddhartha Medical College, Andhra Pradesh revealed that the causes of stress were mostly academic: large content to be learned (84%), poor performance in examinations (76%), lack of time to revise (74%), and lack of recognition/appreciation for work done (68%).⁹

Similarly, the predominant form of stressors, as assessed by the Medical Student Stressors Questionnaire (MSSQ), are related to social, teaching and learning, interpersonal and group activities.¹⁰ Studies have also found the presence of common mental disorders to be associated with other factors like poor self-evaluation of academic performance, difficulty in making friends, perceived lack of emotional support and thoughts of dropping out from studies.¹¹ There are very few studies in Nepal that have looked upon the stress among medical students. Available studies highlighted the need for interventions aimed at reducing stress, promoting well-being, and fostering empathy among medical students to ultimately enhance patient outcomes but have not focused on the contributor of stress.^{12,13} Identification of factors contributing to stress among Nepali medical students helps to design interventions to create a healthier learning environment, enhance resilience, and improve patient care outcomes. It can also help educational institutions and policymakers to allocate resources effectively so that students receive the necessary support and interventions tailored to their specific needs. Considering this background, we conducted this study to assess the level of stress and different stressors among the medical students of Birat Medical College Teaching Hospital.

METHODOLOGY

After obtaining approval from the Institutional Review Committee (Ref: IRC-PA-334/2023), a cross-sectional study was conducted among all MBBS students willing to give consent. Demographic and academic details like age, gender, religion, address and years of medical education were noted. The participants were asked to fill a proforma as per the Medical Students Stressor Questionnaire (MSSQ). This questionnaire uses 40 questions to identify the potential stressors among medical students: Academic related stressors (ARS), intrapersonal and interpersonal related stressors (IRS), teaching and learning related stressors (TLRS), social related stressors (SRS), drive and desire related stressors (DRS) and group activities related stressors (GRS). The participants were asked to evaluate the events by choosing responses as: 'causing mild stress', 'causing moderate stress', 'causing high stress' and 'causing severe stress'. MSSQ score was assessed by assigning a value of 0–4 for each of the respective responses. A response of 'causing mild stress' was scored as 0-1, 'causing moderate stress' was and a response of 'causing severe stress' scored as 4. The MSSQ has been validated to be used in Nepal as well.^{14,6}

Statistical analysis: Data was entered and analyzed using SPSS version 25.0. Descriptive analysis was conducted for variables. Continuous variables were expressed as mean/standard deviation whereas categorical variables were presented as frequency and percentage. A cross-tabulation was performed to determine the differences between demographic variables and the types of Medical Student Stressors (MSS). The chi-square test was used

to study the association between the stress caused by academic, intrapersonal, and interpersonal, teaching and learning, drive and desire, group activities and qualitative variables.

RESULTS

Demography: A total of 324 students participated in the study. The mean age of the participants was 22.05 years (SD=1.87) with a minimum age of 18 years and a maximum of 27 years. Regarding gender distribution, 181 (55.86%) were male and 143 (44.14%) were females. The maximum number of participants were from first year (29.01%, n=94) followed by second year (21.6%, n= 70), third year (19.75%, n=64), fourth year (12.35%, n= 40) and final year (17.28%, n=56). (Table1)

Table 1: Years of study of the participants

| Years of Medical Education | N | % |
|----------------------------|-----|-------|
| First | 94 | 29.01 |
| Second | 70 | 21.60 |
| Third | 64 | 19.75 |
| Fourth | 40 | 12.35 |
| Final | 56 | 356 |
| Total | 324 | 100 |

Table 2: Severity of stress level with respect to different stressors

| Domains of Stressors | Mild | | Moderate | | High | | Severe | |
|----------------------|------|------|----------|-------|------|------|--------|-------|
| | N | % | N | % | N | % | N | % |
| ARS | 16 | 4.94 | 116 | 35.8 | 152 | 46.9 | 40 | 12.35 |
| IRS | 92 | 28.4 | 113 | 34.8 | 92 | 28.4 | 27 | 8.33 |
| TLRS | 39 | 12 | 166 | 51.2 | 106 | 32.7 | 13 | 4 |
| SRS | 78 | 24 | 184 | 56.79 | 58 | 7.9 | 4 | 1.23 |
| DRS | 137 | 42.2 | 135 | 41.6 | 45 | 13.8 | 7 | 2.1 |
| GARS | 68 | 20.9 | 152 | 46.9 | 84 | 25.9 | 20 | 6.1 |

Academy related stressors (ARS):

The mean ARS score was 2.23 (SD=0.707). A majority of participants had high level stress (n=152, 46.9%), followed by moderate stress (n=116, 35.8%), severe stress (n=40, 12.35%) and mild stress (n=16, 4.94%). (Table 2) Out of the 152 with high level stress, majority were from first year (n=39, 25.66%) followed by second year (n=38, 25%). But of the 40 participants who had severe stress, 40% (n=16) were from final year followed by 25% (n=10) from first year. The level of stress related to ARS showed a significant difference with years of study (P=0.004). (Table 3)

Table 3: Association between severity of ARS with gender and years of medical education

| Variables | ARS | | | | | | | | P value |
|----------------------------|------|-------|----------|-------|------|-------|--------|-------|---------|
| | Mild | | Moderate | | High | | Severe | | |
| Gender | N | % | N | % | N | % | N | % | 0.000 |
| Male | 15 | 94% | 86 | 74% | 65 | 42.7% | 15 | 37.5% | |
| Female | 1 | 6% | 30 | 26% | 87 | 57.3% | 25 | 62.5% | |
| Years of medical education | N | % | N | % | N | % | N | % | 0.004 |
| First | 6 | 37.5 | 39 | 33.6 | 39 | 25.6 | 10 | 25 | |
| Second | 5 | 31.25 | 20 | 17.24 | 38 | 25 | 7 | 17.5 | |
| Third | 3 | 18.75 | 31 | 26.72 | 28 | 18.42 | 2 | 5 | |
| Fourth | 1 | 6.25 | 12 | 10.34 | 22 | 14.47 | 5 | 12.5 | |
| Final | 1 | 6.25 | 14 | 12.07 | 25 | 16.45 | 16 | 40 | |

Intrapersonal and Interpersonal related stressors (IRS):

The mean IRS score was 1.67 (SD=0.93). Regarding IRS, majority participants (n=113,34.8%) had a moderate level stress followed by mild and high-level stress (both-n=92,28.4%). Severe stress

was only seen in 8.3% of participants (n=27). (Table 2) There was no significant difference among years of study (P=0.148). (Table 4)

Table 4: Association between severity of IRS with gender and years of medical education

| Variables | IRS | | | | | | | | P value |
|----------------------------|------|-------|----------|-------|------|-------|--------|-------|---------|
| | Mild | | Moderate | | High | | Severe | | |
| Gender | N | % | N | % | N | % | N | % | 0.010 |
| Male | 62 | 67.4 | 63 | 55.7 | 47 | 51.08 | 9 | 33.3 | |
| Female | 30 | 32.6 | 50 | 44.3 | 45 | 48.92 | 18 | 66.7 | |
| Years of medical education | N | % | N | % | N | % | N | % | 0.148 |
| First | 39 | 42.39 | 25 | 22.12 | 26 | 28.26 | 4 | 14.81 | |
| Second | 19 | 20.65 | 28 | 24.78 | 17 | 18.48 | 6 | 22.22 | |
| Third | 16 | 17.39 | 23 | 20.35 | 20 | 21.74 | 5 | 18.52 | |
| Fourth | 7 | 7.61 | 17 | 15.04 | 11 | 11.96 | 5 | 18.52 | |
| Final | 11 | 11.96 | 20 | 17.7 | 18 | 19.57 | 7 | 25.93 | |

Teaching and learning related stressors (TLRS):

A majority of participants (n=166, 51.23%) had a moderate level of TLRS related stress followed by high level stress seen in 106 participants (32.72%). Severe level of stress was seen

only in 13 participants (4.01%). (Table 2) Statistically significant difference was seen with TLRS related stress among different years (P=0.0001). (Table 5)

Table 5: Association between severity of TLRS with gender and years of medical education

| Variables | TLRS | | | | | | | | P value |
|----------------------------|------|-------|----------|-------|------|-------|--------|-------|---------|
| | Mild | | Moderate | | High | | Severe | | |
| Gender | N | % | N | % | N | % | N | % | 0.007 |
| Male | 30 | 76.9 | 96 | 57.8 | 50 | 47.2 | 5 | 38.4 | |
| Female | 9 | 23.1 | 70 | 42.2 | 56 | 52.8 | 8 | 61.6 | |
| Years of medical education | N | % | N | % | N | % | N | % | 0.000 |
| First | 15 | 38.46 | 47 | 28.31 | 30 | 28.30 | 2 | 15.38 | |
| Second | 9 | 23.08 | 31 | 18.67 | 30 | 28.30 | 0 | 0 | |
| Third | 9 | 23.08 | 46 | 27.71 | 5 | 4.72 | 4 | 30.77 | |
| Fourth | 2 | 5.13 | 18 | 10.84 | 18 | 16.98 | 2 | 5.13 | |
| Final | 4 | 10.26 | 24 | 14.46 | 23 | 21.70 | 5 | 38.46 | |

Social related stressors (SRS):

A majority of participants (n=184, 56.79%) had experienced a moderate level of stress due to SRS. This was followed by a mild level of stress seen in 78 participants (24.07%). Severe stress was

only seen in 4 patients (1.23%). (Table 2) Statistically significant difference was seen with SRS related stress among different years (P=0.0001).(Table 6)

Table 6: Association between severity of SRS with gender and years of medical education

| Variables | SRS | | | | | | | | P value |
|----------------------------|------|-------|----------|-------|------|-------|--------|-------|---------|
| | Mild | | Moderate | | High | | Severe | | |
| | N | % | N | % | N | % | N | % | |
| Gender | | | | | | | | | 0.017 |
| Male | 53 | 67.9 | 101 | 54.9 | 24 | 41.3 | 3 | 75 | |
| Female | 25 | 32.1 | 83 | 45.1 | 34 | 58.7 | 1 | 25 | |
| Years of medical education | | | | | | | | | 0.000 |
| First | 41 | 52.56 | 38 | 20.65 | 15 | 25.86 | 0 | 0 | |
| Second | 10 | 12.82 | 43 | 23.37 | 15 | 25.86 | 2 | 50 | |
| Third | 16 | 20.51 | 41 | 22.28 | 7 | 12.07 | 0 | 0 | |
| Fourth | 5 | 6.41 | 25 | 13.39 | 9 | 15.52 | 1 | 25.50 | |
| Final | 6 | 7.69 | 37 | 20.11 | 12 | 20.69 | 1 | 25.0 | |

Desire related stressors (DRS):

Majority (n=137,42.28%) participants had a mild level of DRS related stress followed closely by moderate level of stress (n=135,41.67%). Severe stress was seen only in 7 participants

(2.1%). (Table 2). Statistically significant difference was seen with DRS related stress among different years (P=0.0001). (Table 7)

Table 7: Association between severity of DRS with gender and years of medical education

| Variables | DRS | | | | | | | | P value |
|----------------------------|------|-------|----------|-------|------|-------|--------|-------|---------|
| | Mild | | Moderate | | High | | Severe | | |
| | N | % | N | % | N | % | N | % | |
| Gender | | | | | | | | | 0.021 |
| Male | 83 | 60.58 | 78 | 50.78 | 19 | 42.2 | 1 | 14.3 | |
| Female | 54 | 39.42 | 57 | 49.22 | 26 | 57.8 | 6 | 85.7 | |
| Years of medical education | | | | | | | | | P=0.000 |
| First | 55 | 40.15 | 32 | 23.70 | 6 | 13.33 | 1 | 14.29 | |
| Second | 26 | 18.98 | 37 | 27.41 | 7 | 15.56 | 0 | 0 | |
| Third | 19 | 13.87 | 33 | 24.44 | 12 | 26.67 | 0 | 0 | |
| Fourth | 16 | 11.68 | 14 | 10.37 | 8 | 17.78 | 2 | 28.57 | |
| Final | 21 | 15.33 | 19 | 14.07 | 12 | 26.67 | 4 | 57.14 | |

Group activities related stressors (GARS):

Nearly half participants (n=152, 46.9%) had a moderate levels GARS related stress. This was followed by a high-level stress seen in 84 participants (25.93%). Severe stress was seen only in 20

(6.17) participants. (Table 4) Statistically significant difference was seen with GARS related stress among different years (P=0.002)(Table 8)

Table 8: Association between severity of GARS with gender and years of medical education

| Variables | GARS | | | | | | | | P value |
|----------------------------|------|-------|----------|-------|------|-------|--------|-------|---------|
| | Mild | | Moderate | | High | | Severe | | |
| Gender | N | % | N | % | N | % | N | % | 0.011 |
| Male | 45 | 66.1 | 91 | 59.8 | 35 | 41.6 | 10 | 50 | |
| Female | 23 | 33.9 | 61 | 40.2 | 49 | 58.4 | 10 | 50 | |
| Years of medical education | N | % | N | % | N | % | N | % | P=0.002 |
| First | 34 | 50.00 | 33 | 21.71 | 21 | 25 | 6 | 30 | |
| Second | 7 | 10.29 | 39 | 25.66 | 16 | 19.05 | 8 | 40 | |
| Third | 13 | 19.12 | 29 | 19.08 | 22 | 26.19 | 0 | 0 | |
| Fourth | 7 | 10.29 | 20 | 13.16 | 11 | 13.10 | 2 | 10.00 | |
| Final | 7 | 10.29 | 31 | 20.39 | 14 | 16.67 | 4 | 20.00 | |

Table 9: Correlation between years of medical education and various stressors

| Stressors | Correlation Coefficient | P value |
|--|-------------------------|---------|
| Academic Related Stressor | 0.172 | 0.001 |
| Interpersonal and Intrapersonal Related Stressor | 0.168 | 0.002 |
| Teaching and Learning Related Stressor | 0.145 | 0.008 |
| Social Related Stressor | 0.190 | 0.000 |
| Drive and Desire Related Stressor | 0.226 | 0.000 |
| Group Related Stressor | 0.086 | 0.122 |

There was a correlation between years of study and ARS ($r=0.1721, p=0.0019$), years of study and IRS ($r=0.1685, p=0.023$), years of study and TLRS ($r=0.1457, p=0.0086$), years of study and SRS ($r=0.1909, p=0.0006$) and years of study and DRS ($r=0.2267, p=0.0000$) (Table 9).

DISCUSSION

It has been said that some level of stress may be required in medical school training for effective learning. This stress which facilitates learning has been labelled as "favorable stress". However, stressors may be perceived differently by different individuals, depending on coping skills, experience, cultural background and personal traits.¹⁷ Our study showed that all of the participant medical students had some level of stress ranging from mild to severe. This is similar to finding in a study by Houry et al. where about 90% of the participants had some form of stress.¹¹

In our study, we assessed the severity of stress with respect to 6 different domains of stressors (ARS, IRS, TLRS, SRS, DRS and GARS). Severity of stress was more in female compared to male in all domains of stressors. This was different from a study by Abdulghani et al. which showed predominance of the ARS, IRS, DRS, and GARS in females, whereas TLRS and SRS were more common in males.¹⁸ Our findings were also different from findings by Eva et al, which showed no difference in stress levels between males and females.¹⁹ The cause of increased severity of stress in females in our study may be multifactorial. This warrants

further studies in the future to investigate the underlying causes contributing to the differences in gender.

When examining the distribution of stress level across different years of medical education it was found that ARS severity appears to increase as students progress through their education, with final-year students reporting the highest levels of severe ARS (40%) which was supported by other similar studies where academic related stressor was the major contributor of stress among medical students.^{11,16,18,19} This suggests that severity of academic related stress varies throughout medical years with final year facing increased stress compared to earlier years. This could be due to various factors such as pressure of completing degree, future uncertainties and demand of final exam.

TLRS, SRS, DRS, and GARS were found to be significant stressors, with mild to moderate stress being the most prevalent across all categories. This was similar to study by Habeeb et al which showed majority participants had mild to moderate level of severity in these domains of stressors.¹⁰ Regarding variation across different years of medical education, a significant difference was seen between years of medical education and all domains of stressors except interpersonal and intrapersonal related stressor. Final year students consistently showed higher levels of severe stress across all stressors, possibly due to the culmination of academic demands and the transition to clinical practice. In contrast to the findings in our study, a study done by Ebrahim et.al. found that the year of medical education did not modulate the levels of stress in medical students.²⁰

CONCLUSION

In our study we aimed to assess the main stressors and level of stressors in medical students. All the participating students had some level of stress and the majority had a moderate level stress. But while assessing ARS, a majority had high level stress.

Interventions to reduce these stressors should be implemented for all medical students. There should be continuous supervision from the college/university to detect and mitigate the factors that will increase the stressors. Support groups including faculty members, psychiatrists and psychologists may be needed which can plan for student social activities. Leave provisions may need to be relaxed. A cordial environment should be created among

students, staff and faculties.

LIMITATIONS OF THE STUDY: There were limitations in our study that should be acknowledged. The cross-sectional design prevented us from establishing causal relationships between stressors and outcomes. Being a single-center study, our findings may not be generalizable to all Nepalese medical students. Exclusion of postgraduates limits the broader applicability of our results. Additionally, our use of a single scale may not have fully captured the range of mental health issues among students.

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