Perceived Stress and Stressors among Medical and Dental Students of Bhairhawa, Nepal: A Descriptive Cross-sectional Study

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ABSTRACT

Introduction: Medical school is recognized as a stressful environment that may have a negative effect on a student’s academic performance, health, and psychosocial well-being. This could further impact future health professionals’ attitudes and compromise patients’ care. This study aims to find out various sources of stress for medical and dental students to help prevent many future health problems in a student’s life.

Methods: It was a cross-sectional study done in Universal College of Medical Sciences, Bhairhawa, Nepal, among undergraduate final year bachelor of medicine and bachelor of surgery and third and fourth year (phase I and phase II) dental students, using a questionnaire with Likert’s scale. Data obtained was tabulated and analyzed using analysis of variance.

Results: Results showed that stress during exam 210 (92.9%) and preparation phase 200 (88.5%) stood out as the maximum stressors for our study group. The least stress-causing element was recorded as terms with seniors 45 (19.9%), adjustment with roommates 52 (23.01%), and competing with peers 69 (30.53%). Length of course 187 (82.74%), understanding the course 173 (76.55%), reading several textbooks 171 (75.66%), and work overload 165 (73.01%) amounted to significant stressors.

Conclusions: Stress has a detrimental effect both on health as well as academic performance. The stressors at the campus should be identified and proper coping assistance should be provided to individual students. Systemic efforts are needed to address their concerns and make mental health care easily accessible to them. Counseling and awareness are recommended.

Keywords: academic performance; medical school; mental health; stress.

INTRODUCTION

Medical students world over have been found at risk of psychological stress, mental disorders, and decreased life satisfaction. It is reported that 27% of health professional students develop psychological morbidities during training.1 Various stress-related illnesses, including anxiety, depression, suicidal ideations,2 somatoform disorders3 have been documented among health professional students. It leads to impaired judgments and addiction to substances such as khat chewing, cigarette smoking, and alcohol drinking.4

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Although this can be traced from various sources, stress plays a precipitating role. Despite the problem of stress widely being acknowledged in health professional training, little attention has been given to it especially by training institutions in developing countries. Intending to groom future health professionals that are resilient, stress during training has to be identified and addressed, we designed a study with a focus on documenting the prevalence of stress and its sources among health professional students.

**METHODS**

This descriptive cross-sectional study was conducted among college students studying at Universal College of Medical Sciences, Bhairhawa, Nepal from July to September 2018. The study population consisted of undergraduate medical students. Convenience sampling was used for the selection of the participants. The study population included all the dental students with clinical subjects and final year medical students. Ethical clearance was obtained from the institutional ethical committee. A questionnaire was distributed manually and displayed in the classroom among students of bachelor of medicine and bachelor of surgery (MBBS) (final year) and a bachelor of dental surgery BDS (3rd and 4th-year phases I and II). The students of M.B.B.S (final year) and B.D.S (3rd and 4th-year phases I and II) in medical college who gave consent were included in the study. The students who were absent on the day of data collection were excluded.

The sample size was calculated as follows,

\[ n = \frac{Z^2 \times (p\times q)}{e^2} \]

\[ = 1.96^2 \times 0.3 \times 0.7 / 0.06^2 \]

\[ = 0.81 / 0.0036 \]

\[ = 225 \]

where,

- \( n \) = required sample size
- \( p \) = prevalence, 30%
- \( q = 1-p \)
- \( e = \) margin of error, 6%
- \( Z = 1.96 \) at 95% Confidence Interval

In the present study, the following information was collected from the participants:

I. Personal data: it included general information regarding age, gender, residential area, course, batch, etc.

II. Stress inducing factors: They were divided into three categories of potential sources of stress.

a. Academic: academic achievements, examinations, and course material, competition among students (Question 2 to 5).

b. Office relationships: get certificates, scholarships, etc. from the office (Question 6 to 12).

c. Social factors: social aspects in college, relationships in classrooms, parental influences, seniors’ supports, etc. (Question 13 to 15).

Each item was scaled (Likert’s scale) as:

0: no stress,
1: mild stress (sometimes stressful),
2: moderate stress (often stressful),
3: considerable stress (always stressful),
4: extreme stress.

A total score was obtained from summing up the score of each subgroup. Average subgroups of individuals were compared. Data was entered in Microsoft excel sheet and analyzed using statistical package for social sciences (SPSS) software version 20.

**RESULTS**

This study included a total of 226 medical students; all with clinical exposure in the field of medicine. Among them, 122 (53.98%) final year MBBS students and 104 (46.02%) BDS students. BDS included 3rd year were 22 (9.73%), 4th year phase I were 53 (23.45%), 4th-year phase II were 29 (12.84%). The total sample included 107 (47.35%) males, and 119 (52.65%) females (Table 1).

| Variables | n (%) |
|-----------|-------|
| Sex       |       |
| Male      | 107 (47.35) |
| Female    | 119 (52.65) |
| Programme |       |
| MBBS      | 122 (53.98) |
| BDS       | 104 (46.02) |
| Year of study |       |
| MBBS Final year | 122 (53.98) |
| BDS 3rd year | 22 (9.73) |
| BDS 4th year Phase I | 53 (23.45) |
| BDS 4th year Phase II | 29 (12.84) |

The score of individual stressors was totaled; and any score 2 i.e. moderate stress (often stressful) and above were considered, the result showed that stress during exam 210 (92.92%) and preparation phase 200 (88.5%) stood out as the maximum stressors for our study group. The least stress-causing element was recorded as terms with seniors 45 (19.91%), adjustment with roommates 52 (23.01%), and competing with peers 69 (30.53%). Though the length of course 187 (82.74%), understanding the course 173 (76.55%), reading...
several textbooks 171 (75.66%) and work overload 165 (73.01%) amounted to significant stressors, as noted by the majority of participants, none surpassed the stress perceived during exam time (Table 2).

| Stressors                                      | n (%) (score ≥2) | Male (score ≥2) | Female (score ≥2) |
|------------------------------------------------|------------------|-----------------|-------------------|
| Length of the course                          | 187 (82.74)      | 74 (69.15)      | 109 (91.6)        |
| Understanding the course                      | 173 (76.55)      | 70 (65.42)      | 100 (84.03)       |
| Reading number of textbooks                   | 171 (75.66)      | 74 (69.15)      | 98 (82.35)        |
| Work overload                                  | 165 (73.01)      | 69 (64.48)      | 96 (80.67)        |
| Keeping in your teachers good books           | 140 (61.95)      | 63 (58.88)      | 77 (64.7)         |
| Maintaining good terms with all your batch mates | 79 (34.96)   | 48 (44.85)      | 31 (26.05)        |
| Stress during exams                           | 210 (92.92)      | 92 (85.9)       | 118 (99.2)        |
| Preparation phase                             | 200 (88.5)       | 91 (85.04)      | 109 (91.6)        |
| Parental pressure to excel                     | 81 (35.84)       | 46 (42.9)       | 35 (29.4)         |
| Competing with peers                          | 69 (30.53)       | 34 (31.77)      | 35 (29.4)         |
| Score well for certificates/ scholarships      | 146 (64.6)       | 63 (58.88)      | 83 (69.74)        |
| Being away from home                          | 138 (61.06)      | 49 (45.79)      | 89 (74.78)        |
| Adjustment with roommates                     | 52 (23.01)       | 31 (28.97)      | 21 (17.6)         |
| Terms with seniors                            | 45 (19.91)       | 29 (27.1)       | 16 (13.4)         |

Table 2. Stress response to individual stressors.

Among the male and female participants, 118 (99.2%) out of 119 (female participants) reported stress during exam time as compared to 92 (85.04%) out of 107 male participants. 109 (91.6%) females find preparatory phase and length of course as stress giving as compared to 91 (85.9%) and 74 (69.15%) males respectively. Least stress-causing for the female group was having terms with seniors 16 (13.4%) and adjustment with roommates 21 (17.6%) as was for males too, 29 (27.1%), and 31 (28.97%) respectively (Table 3).

When comparing subject wise, stress during exam was again the most noted stressor among both MBBS 115 (94.26%) and BDS 95 (91.35%) students; wherein among BDS 3rd year noted 22 (100%), 4th-year phase I and phase II noted 47 (88.68%) and 26 (89.65%) respectively, which was highest among these subgroups too. MBBS students gave second place to preparatory phase 113 (92.62%), while the second high stress-causing factor for BDS students was the length of the course, work overload each scoring 91 (87.5%) where n was equal to or more than 2. Least stress-causing among MBBS were terms with seniors 27 (22.13%) and competing with peers 34 (27.87%). For BDS students low stress-causing factors were terms with senior 18 (17.31%) with seniors and adjustment with roommates 22 (21.15%) respectively (Table 4).
Table 4. Comparison of stress response to individual stressor among MBBS, BDS subject clinical subject-wise and MBBS final year, BDS 3rd year, BDS 4th year phase I and phase II as groups.

| Stressors                                | MBBS Final year n (%) | BDS 3rd year n (%) | BDS 4th year phase I n (%) | BDS 4th year phase II n (%) | BDS n (%) |
|------------------------------------------|-----------------------|--------------------|---------------------------|-----------------------------|-----------|
| Length of the course                     | 96 (78.68)            | 20 (90.91)         | 43 (81.13)                 | 28 (96.55)                  | 91 (87.5) |
| Understanding the course                 | 92 (75.41)            | 19 (86.34)         | 37 (69.81)                 | 25 (86.21)                  | 81 (77.88) |
| Reading number of textbooks              | 87 (71.31)            | 20 (90.91)         | 38 (71.7)                  | 26 (89.65)                  | 84 (80.77) |
| Work overload                            | 74 (60.65)            | 18 (81.82)         | 47 (88.68)                 | 26 (89.65)                  | 91 (87.5) |
| Keeping in your teachers good books      | 67 (54.92)            | 16 (72.73)         | 35 (66.04)                 | 22 (75.86)                  | 73 (70.2) |
| Maintaining good terms with all your batch mates | 52 (42.62)         | 8 (36.37)          | 15 (28.30)                 | 4 (13.8)                    | 27 (25.97) |
| Stress during exams                      | 115 (94.26)           | 22 (100)           | 47 (88.68)                 | 26 (89.65)                  | 95 (91.35) |
| Preparation phase                        | 113 (92.62)           | 19 (86.34)         | 40 (75.47)                 | 28 (96.55)                  | 87 (83.65) |
| Parental pressure to excel               | 53 (43.44)            | 9 (40.91)          | 17 (32.07)                 | 2 (6.9)                     | 28 (26.92) |
| Competing with peers                     | 34 (27.87)            | 7 (31.82)          | 20 (37.73)                 | 8 (27.59)                   | 35 (33.65) |
| Score well for certificates/scholarships | 73 (59.84)            | 15 (68.18)         | 28 (52.83)                 | 23 (79.31)                  | 66 (63.46) |
| Being away from home                     | 68 (55.74)            | 11 (50)            | 36 (66.04)                 | 24 (82.76)                  | 70 (67.31) |
| Adjustment with roommates                | 30 (24.59)            | 5 (22.73)          | 12 (22.64)                 | 5 (17.24)                   | 22 (21.15) |
| Terms with seniors                       | 27 (22.13)            | 7 (31.82)          | 6 (11.32)                  | 5 (17.24)                   | 18 (17.31) |

One way any of variance (ANOVA) was used to compare means of different stressors in various batches (Table 5).

Table 5. Comparison of mean score for Stress response to individual stressor among MBBS students final year, BDS 3rd year, BDS 4th year phase I and phase II.

| Stressors                                | MBBS Final year | BDS 3rd year | BDS 4th year phase I | BDS 4th year phase II | F-value |
|------------------------------------------|-----------------|--------------|----------------------|-----------------------|---------|
| Length of the course                     | 2.4 ± 1.2       | 3.05 ± 1.2   | 2.5 ± 1.01           | 2.72 ± 0.84           | 2.325   |
| Understanding the course                 | 2.1 ± 1.01      | 2.3 ± 0.8    | 2.1 ± 1.02           | 2.3 ± 0.8             | 0.732   |
| Reading number of textbooks              | 2.3 ± 1.3       | 2.6 ± 0.91   | 2.3 ± 1.21           | 2.5 ± 0.9             | 0.695   |
| Work overload                            | 2.03 ± 1.3      | 2.5 ± 1.1    | 3.1 ± 1.2            | 2.9 ± 1.03            | 11      |
| Keeping in your teachers good books      | 1.8 ± 1.3       | 1.8 ± 1.1    | 1.96 ± 1.2           | 2.34 ± 1.3            | 1.35    |
| Maintaining good terms with all your batch mates | 1.5 ± 1.5       | 1.4 ± 1.1    | 0.98 ± 1.1           | 0.75 ± 0.91           | 3.25    |
| Stress during exams                      | 3.3 ± 0.9       | 3.6 ± 0.66   | 3.2 ± 1.3            | 3.41 ± 0.98           | 0.907   |
| Preparation phase                        | 3.1 ± 1.01      | 2.91 ± 1.02  | 2.36 ± 1.2           | 3 ± 0.9               | 5.78    |
| Parental pressure to excel               | 1.6 ± 1.5       | 1.1 ± 0.9    | 1.1 ± 1.1            | 0.5 ± 0.6             | 6.5     |
| Competing with peers                     | 1.02 ± 1.3      | 1.3 ± 0.93   | 1.4 ± 1.2            | 1.1 ± 1.1             | 1.03    |
| Score well for certificates/scholarships | 1.9 ± 1.4       | 2.13 ± 1.3   | 2.03 ± 1.3           | 2.3 ± 1.04            | 0.75    |
| Being away from home                     | 1.8 ± 1.5       | 1.9 ± 1.6    | 2.3 ± 1.5            | 2.6 ± 1.4             | 3.52    |
| Adjustment with roommates                | 0.9 ± 1.4       | 0.7 ± 0.8    | 1.02 ± 1.3           | 0.9 ± 1.1             | 0.367   |
| Terms with seniors                       | 0.9 ± 1.1       | 1.1 ± 0.8    | 0.4 ± 0.7            | 0.6 ± 0.7             | 3.98    |
DISCUSSION

Stress among students is a global phenomenon and studies have revealed that medical students have severe stress levels. Chronic stress may also lead to deterioration of academic performance, loss of memory, poor relationships with peers and family members, and overall dissatisfaction with life. This chronic exposure can also lead to serious health problems like hypertension, heart attack and stroke, diabetes mellitus, and obesity, accelerated aging, impaired the immune system, suppressed fertility, digestive problems and loss of appetite, and an increases anxiety and depression that finally lead to suicide. Stress has also been found to be associated with sleep problems and lower academic performances. Furthermore, it has also been linked to substances use and drug addiction.

Various studies revealed that the stressors affecting medical students’ well-being seems to be related to the medical training especially related to academic matters. They found that the top four stressors were tests and examinations, time pressure, too many content to be studied, and getting behind in work. Another three common stressors were conflicting demands, not getting work done within the time planned and heavy work load. In our study majority of the students experienced stress during exam and preparatory phase, closely followed by academic stressors (length, of course, understanding the course, reading a number of textbooks and work overload). Similar results were reported by Bhavani Nivetha M, et al. in 2018 in their study wherein 40.9% of study participants stated academic-related stressors to be the source of high stress followed by inter and intra-personal related stressors 33.3%. A study done by Gupta, et al. in Kolkata showed 94% had academic-related stressors and 78% had Interpersonal stressors. The other studies done by Chowdhury, et al. 16 Panchu, et al. Melaku, et al. all showed a similar result with academic-related stressor being the major contributor of stress.

The vastness of the medical syllabus and lack of proper time management lessons for the students are the main reason for examination time, preparation for it and academic causes being the major stressor. Yusoff and Esa noted that curriculum differences in medical schools may not necessarily cause differences in the overall pattern of stressors (i.e. most of the top stressors are related to academic matters), although frequency (rank) of some stressors may be significantly different.

The genesis of emotional and mental stress among medical students may be multifactorial. A medical student has to cope with high expectations of the parents, teachers, and patients; time constraints for pursuing their alternate interests along with trying to keep up with the vast curriculum and exam preparation. In our study, comparison of means of different stressors in various batches i.e. MBBS final year, BDS 3rd year, 4th-year phase I and phase II showed that work overload, parental pressure to excel, the preparation phase, terms with seniors and being away from home were found to be highly significant. High expectations from self and family members, coupled with the training for assuming responsibility for the well-being of the patient, make a medical student prone to experience stress which may become excessive.

Efforts are required to cater to medical students who are distressed, in a nonintrusive manner. Awareness about manifestations of distress among medical students needs to be increased among not only students themselves, but also other stakeholders such as medical educationists and parents.

It is suggested that each institute should have its orientation program and counseling services. The work should begin from entry to a medical college. A psychiatrist or psychologist present in the interview board at the time of admission, to screen the entrants, will be beneficial. Survey of US and Canadian medical schools showed 78% of schools had a member of psychiatry faculty in the admission committee. Legislation may vary in different parts of the world, but perhaps those who require assistance and counseling can be identified at the earliest.

Many institutions have employed various techniques for stress management. These include primary preventive measures such as psycho-educational lectures, seminars on stress management, and therapeutic practice like crisis intervention and counseling. Since resurgence from ‘burnout’ is related with a decline in suicidal tendency, signs and symptoms of this ‘burnout’ should be identified with potential factors which decrease and finally treat it. Wellness and mental health programs are also needed to help students make a smooth transition between different learning environments with changing learning demands and a growing burden on their mental and physical capacity. Medical schools in the United States and Canada have initiated health-promotion programs and have reported positive results in reducing the negative effects of stress upon the health and academic performance of medical students. Medical educators need to know the prevalence, causes, and levels of stress among students which not only affects their health but academic achievements and the well-being of the patient in their care also. With early identification and effective psychological services, possible future illnesses may be prevented. On the
other hand, a minimal amount of stress is necessary
to add spice to one’s life and to achieve optimal
performance at examinations. An element of stress
is involved with growth and is essential for sound
personal functioning.24

This cross-sectional study was based on self-reported
information provided by students. Therefore, there
is some potential for reporting bias which may have
occurred because of the respondents’ interpretation
of the questions or desire to report their emotions in
a certain way or simply because of inaccuracies of
responses. Further long-term studies need to be carried
out to investigate the levels of stress among students
in all the five years of undergraduate medical years and
the associated factors; its relevance to their physical,
emotional, and mental wellbeing. Studies could be done
to evaluate coping strategies employed by students to
overcome stress. Studies focusing on the immediate
and long-term impact of stress during medical training
on patient care also need to be carried out.

CONCLUSIONS

It is clear from the results of this study that the student
surveyed, were exposed to a variety of environmental
and interpersonal stressors. Given the detrimental
effects of stress on health and academic performance,
there is a need to incorporate stress management
training into orientation activities. At a minimum, the
most commonly identified sources of stress should
be discussed with students. Furthermore, students
should be informed of the campus resources available
to help them address these stresses. One approach
may be the use of stress management workshops.
Counseling programs for students to provide effective
coping strategies by educationists and support to at-
risk students will go a long way during their studies.
The presence of a counseling team among the faculty
is necessary.

Conflict of Interest: None.

REFERENCES

1. Haoka T, Sasahara S, Tomotsune Y, Yoshino S, Maeno T, Matsuzaki I. The effect of stress-related factors on mental health status among resident doctors in Japan. Med Educ. 2010 Aug;44(8):826-8. [PubMed | Full Text | DOI]
2. Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, et al. Burnout and suicidal ideation among U.S. medical students. Ann Intern Med. 2008 Sep 2;149(5):334-41. [PubMed | Full Text | DOI]
3. Bramness JG, Fjxdal TC, Vaglum P. Effect of medical school stress on the mental health of medical students in early and late clinical curriculum. Acta Psychiatr Scand. 1991 Oct;84:540-5. [PubMed | Full Text | DOI]
4. O’Rourke M, Hammond S, O’Flynn S, Boylan G. The medical student stress profile: a tool for stress audit in medical training. Med Educ. 2010 Oct;44(10):1027-37. [PubMed | Full Text | DOI]
5. Behere SP, Yadav R, Behere PB. A comparative study of stress among students of medicine, engineering, and nursing. Indian J Psychol Med. 2011 Jul;33(2):145-8. [PubMed | Full Text | DOI]
6. Shah C, Trivedi RS, Diwan J, Dixit R, Anand AK. Common stressors and coping of stress. Journal of Clinical and Diagnostic Research. 2009 Aug;3:1621-6. [Full Text]
7. Likert RA. A technique for the measurement of attitudes. Archives of Psychology. 1932;140. [Full Text]
8. Stewart SM, Betson C, Marshall I, Wong CM, Lee PWH, Lam TH. Stress and vulnerability in medical students. Med Educ. 1995 Mar;29(2):119-27. [PubMed | Full Text | DOI]
9. Kaufman DM, Day V, Mensink D. Stressors in 1-year medical school: comparison of a conventional and problem-based curriculum. Teaching and Learning in Medicine. 1996;8(4):188-94. [Full Text | DOI]
10. Yousafzai AW, Ahmer S, Syed E, Bhutto N, Iqbal S, Siddiqi MN. Well-being of medical students and their awareness on substance misuse: a cross-sectional survey in Pakistan. Ann Gen Psychiatry. 2009 Feb 19;8. [PubMed | Full Text | DOI]
11. Kaufman DM, Day V, Mensink D. Stressors in Medical School: Relation to curriculum format and year of study. Teaching and Learning in Medicine. 1998;10(3):188-94. [Full Text | DOI]
12. Yussof MS, Abdul Rahim AF, Yaacob MJ. Prevalence and sources of stress among universiti sains Malaysia medical students. Malays J Med Sci. 2010;17(1):30-7. [PubMed | Full Text]
13. Yussof MSB, Esa AR. Stress Management for medical students: asystematic review. Social Sciences and Cultural. Intech Open. 2012 Sep 19. [Full Text]
14. Bhavani NM, Ahmed M, Prashantha B. Perceived stress and source of stress among undergraduate medical students of Government Medical College, Mysore. Int J Community Med Public Health. 2018 Aug;5(8):3513-8. [Full Text | DOI]
15. Gupta S, Choudhury S, Das M, Mondol A, Pradhan R. Factors causing stress among students of a medical college in Kolkata, India. Educ Health. 2015;28:92-5. [PubMed | Full Text | DOI]
16. Chowdhury R, Mukherjee A, Mitra K, Naskar S, Karmakar PR, Lahiri SK. Perceived psychological stress among undergraduate medical students: Role of academic factors. Indian J Public Health. 2017;61:55-7. [Full Text | DOI]
17. Panchu P, Bahuleyan B, Vijayan V. An analysis of the factors leading to stress in Indian medical students. Int J Clin Exp Physiol. 2017;4:48-50. [Full Text]
18. Melaku L, Mossie A, Negash A. Stress among medical students and its association with substance use and academic performance. J Biomed Education. 2015;1-9. [Full Text | DOI]
19. Brahmbhatt K, Nadeera V, Prasanna K, Jayram S. Perceived stress and sources of stress among medical undergraduates in a private medical college in Mangalore, India. Int J Biomed Adv Res. 2013;4:128-36. [Full Text] [DOI]

20. Sood R. Medical education in India. Med Teach. 2008;30:85-91. [PubMed] [DOI]

21. Mahajan AS. Stress in medical education: a global issue or much ado about nothing specific? South-East Asian Journal of Medical Education. 2010;4:2. [Full Text]

22. Willer B, Keill S, Isada C. Survey of US and Canadian medical school on admissions and psychiatrically at risk students. Journal of Medical Education. 1984;59:928-35. [PubMed] [DOI]

23. Rathbun J. Helping medical students develop lifelong strategies to cope with stress. Academic medicine. 1995;70(11):955-6. [PubMed] [DOI]

24. Abdulghani HM, Al Kanhal AA, Mahmoud ES, Ponnampерuma GG, Alfaris EA. Stress and its effects on medical students. J Health Popul Nutr. 2011 Oct;29(5):516-22. [PubMed] [Full Text] [DOI]

25. Abramovitch H, Schreier A, Koren N. American medical students in Israel: stress and coping-a follow-up study. Med Educ. 2000;34:890-6. [PubMed] [Full Text] [DOI]