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# Original Research

## An evaluation of the level of stress and the characteristics of stressors experienced by postgraduate students at a medical institution in Nepal; a descriptive cross-sectional study

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***ABSTRACT:***
**Background**: Postgraduate medical residency is a demanding and stressful period of training for doctors, with long working hours, heavy workloads, and high patient care responsibilities. The aim of this study is to identify levels of stress and stressors among residents at a tertiary care center. **Method**: A descriptive cross-sectional analytical study was conducted using a self-administered questionnaire at the Patan Academy of Health Sciences, a tertiary care medical college in Nepal, from October to November 2022. The study population included all 1st, 2nd, and 3rd-year postgraduate residents from different departments, and the study instrument was a pre-designed, pre-tested, self-administered, and structured questionnaire. **Result**: Out of 130 residents, 23 (17.7%) reported no stress, 32 (24.6%) reported mild stress, 26 (20%) reported moderate stress, and 49 (37.7%) reported severe stress. The major causes of stress in our study were time pressure and deadlines to meet (degree of stress mean (SD): 2.65 (0.995)) and a large amount of content to be learned (degree of stress mean (SD): 2.58 (1.002)). **Conclusion**: Our findings suggest that the stress levels among residents at our study site are higher than in other nations. Medical institutions in our country should implement supportive measures, such as counseling, mentorship, and work-hour adjustments, to address the issue of stress among medical residents. By providing residents with the resources they need to manage stress, medical institutions can improve residents' well-being and ultimately help them succeed in their medical careers.
**Keywords:** Postgraduate students, Residency, Stress, Stressors

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### INTRODUCTION

Medical education is considered to be one of the most academically and emotionally demanding training programs of any profession, and such demands and stress cause a negative effect on the student's psychological well-being. [1]

The term "stress," as it is currently used, was coined by Hans Selye in 1936, who defined it as "the non-specific response of the body to any demand for change." [2]

Excessive stress may reduce students' self-esteem, causing anxiety, depression, interpersonal conflict, sleep disturbances, reduced concentration, incompetence, fear, anger, and guilt. [3] If not addressed, stress has been linked to medical student suicide, drug and alcohol abuse, and depression, which, in the long run, may affect the lives of patients.[3,4]

Stress symptoms in medical students were found to be common compared to other students in an Egyptian study.[5] Moderate to high levels of psychological distress were reported in postgraduate medical students in the studies done in medical colleges in Malaysia and India. [6,7] There are few studies on stress among undergraduate medical students in Nepal[8] but to our best knowledge there are no published studies on postgraduate medical students.

Postgraduate residents play a vital role in the medical care delivery in any teaching hospital and stress among them may in turn negatively impact patient care and result in frequent medical errors and suboptimal care practices. So this study was conducted with the aim to assess the level of stress and sources of stress among postgraduate medical residents, which would help in the future to design appropriate strategies to address or prevent any related potential negative consequences.

## METHODS

This is a cross-sectional analytical study conducted from October to November 2022 at the Patan Academy of Health Sciences, a medical college in Nepal, using self-administered questionnaires. The study population included all 1st, 2nd, and 3rd year postgraduate residents studying in different departments. After the approval of the Institutional Review Committee, the email addresses of all the postgraduate medical students were obtained from the communicating officer. Emails containing information and the objectives of the study were mailed to all the residents. Those willing to participate were asked to sign a consent form and fill out the questionnaire in a Google Form attached along with the email. A reminder was sent if no response was received within the first week. Out of a total of 136 postgraduate residents who were contacted, 130 students responded and completed the questionnaire.

The study instrument was a predesigned, pretested, self-administered, and structured questionnaire consisting of 3 sections. The first section consisted of sociodemographic data. The second section assessed the level of stress and consisted of the Kessler psychological distress scale (K10). The third section assessed stressors and consisted of a postgraduate stress questionnaire (PSQ).

The Kessler10 Psychological Distress Scale (K10)[10] has been developed by Kessler and colleagues, to measure current (1-month) distress. It has been designed to measure the level of distress and severity associated with psychological symptoms in population surveys. The K10 consists of 10 questions. The five possible responses range from “none of the time” to “all of the time” and are scored from 1 to 5. The numbers attached to the patient's 10 responses are added up to get the total score. A score of less than 20 is likely to be well, 20-24 are likely to have mild stress, 25-29 are likely to have moderate stress and ≥ 30 are likely to have severe stress.

Postgraduate Stressor Questionnaire (PSQ) 6 is a self-administered questionnaire developed to identify the stressors as well as the intensity of stress among postgraduate medical students. It consists of 28 items with 7 domains which are Academic related stressors (ARS), Poor relationship with superior related stressors (PRRS), Bureaucratic constraints related stressors (BCRS), Work-family conflicts related stressors (WFRS), Poor relationship with colleagues related stressors (PCRS), Performance pressure related stressors (PPRS) and Poor Job prospects related stressors (PJRS). The items of the PSQ were rated under 5 categories of responses The chi-square test was used to observe and quantify an association between the different study variables. A p-value of less than 0.05 was considered to be statistically significant.(causing no stress at all, causing mild stress, causing moderate stress, causing high stress, causing severe stress) to indicate the intensity of stress caused by them.

Collected data were analyzed by means of SPSS version 20. Socio-demographic characteristics and level of stress of participants were tabulated as numbers and percentages. Stressors among postgraduate medical students were tabulated as a number, and the degree of stress was expressed as the mean with standard deviation.

## RESULTS

A total of 136 postgraduate students were approached for this study, among whom the response rate was 95.5% (130 students).

The sociodemographic profile of participating residents is shown in Table 1.

**Table 1: Socio-demographic characteristics of postgraduate medical students (n= 130)**

| Characteristics | Number (%) |
|---|---|
| Sex | |
| Male | 92(70.8) |
| Female | 38(28.2) |
| Marital- status | |
| Single | 75(57.7) |
| Married | 55(42.3) |
| Year of residency | |

| | |
|---|---|
| 1st | 49(37.7) |
| 2nd | 44(33.8) |
| 3rd | 37(28.5) |
| Faculty | |
| Medical | 83(63.8) |
| Surgical | 47(36.2) |

**Table 2**: **Level of stress among postgraduate medical students**

| Variables | Number (%) |
|---|---|
| Not stressed | 23(17.7) |
| Mild stress | 32(24.6) |
| Moderate stress | 26(20) |
| Severe stress | 49(37.7) |
| Total | 130 |

It is seen from Table 2 that the prevalence of stress was 81.3%, out of which severe stress accounted for 37.7%.

**Table 3:** Association of stress with socio-demographic characteristics of postgraduate medical students

| Characteristics | Not stressed | Stressed | | | | Odds ratio (95% Confidence interval) | p-value |
|---|---|---|---|---|---|---|---|
| | | Mild | Moderate | Severe | Total | | |
| Sex | | | | | | | |
| Male | 20 | 27 | 18 | 27 | 72 | 0.309(0.086-1.109) | 0.060 |
| Female | 3 | 5 | 8 | 22 | 35 | | |
| Marital- status | | | | | | | |
| Single | 16 | 19 | 13 | 27 | 59 | 0.538(0.205-1.414) | 0.204 |
| Married | 7 | 13 | 13 | 22 | 48 | | |
| Year of residency | | | | | | | |
| 1st | 8 | 16 | 9 | 16 | 41 | | 0.432 |
| 2nd | 6 | 8 | 12 | 18 | 38 | | |
| 3rd | 9 | 8 | 5 | 15 | 28 | | |
| Faculty | | | | | | | |
| Medical | 14 | 23 | 17 | 29 | 69 | 1.167(0.462-2.948) | 0.73 |
| Surgical | 9 | 9 | 9 | 20 | 38 | | |

It is seen that the odd of stress in male compared to female population was 0.309(0.086-1.109) with the p-value of 0.060, single compared to the married population was 0.538(0.205-1.414) with the p-value of 0.204, and medical compared to surgical residents is 1.167(0.462-2.948) with the p-value of 0.73.

**Table 4: Stressors among postgraduate medical students as identified by the Postgraduate Stressor Questionnaire**

| S. N. | Items | No Stress at All | Mild Stress | Moderate Stress | High Stress | Severe Stress | Degree of stress* Mean(SD) |
|---|---|---|---|---|---|---|---|
| | Academic related stressors | | | | | | |
| 1. | Tests/Examinations | 7 | 22 | 57 | 36 | 8 | 2.12(0.948) |
| 2. | Lack of time to review what has been learned | 2 | 19 | 35 | 47 | 21 | 2.53(0.999) |
| 3. | Difficulty understanding content | 10 | 48 | 41 | 27 | 4 | 1.75(0.975) |
| 4. | Large amount of content to be learned | 1 | 21 | 34 | 49 | 25 | 2.58(1.002) |
| | Performance pressure related stressors | | | | | | |
| 5 | Time pressures and deadlines to meet | 2 | 13 | 44 | 41 | 30 | 2.65(0.995) |
| 6. | Work overload | 2 | 21 | 35 | 48 | 24 | 2.55(1.020) |
| 7. | Fear of making serious mistakes | 3 | 35 | 41 | 31 | 20 | 2.23(1.082) |
| 8. | My work is mentally straining | 5 | 37 | 44 | 30 | 14 | 2.08(1.049) |
| | Work family related stressors | | | | | | |
| 9. | Work demands affect by personal life | 4 | 32 | 44 | 33 | 17 | 2.21(1.054) |
| 10. | Advancing a career at the expense of home life | 6 | 32 | 31 | 33 | 28 | 2.35(1.199) |
| 11. | My life is too centered on my work | 5 | 33 | 33 | 40 | 19 | 2.27(1.112) |
| 12. | Absence of emotional support from family | 54 | 30 | 22 | 14 | 10 | 1.20(1.296) |
| | Bureaucratic constraints related stressors | | | | | | |
| 13. | Lack of authority to carry out my job duties | 15 | 50 | 40 | 17 | 8 | 1.64(1.049) |
| 14. | Unable to make full use of my skills and ability | 17 | 44 | 37 | 25 | 7 | 1.70(1.090) |
| 15. | Cannot participate in decision making | 25 | 44 | 37 | 18 | 5 | 1.50(1.0801) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 16. | Having to do work outside of my competence | 31 | 36 | 32 | 25 | 6 | 1.53(1.1824) |
| | Poor relationship with superior related stressors | | | | | | |
| 17. | Lack of support from superiors | 36 | 37 | 33 | 15 | 9 | 1.41(1.20) |
| 18. | Difficulty in maintaining relationship with superior | 34 | 45 | 26 | 13 | 12 | 1.41(1.23) |
| 19. | My beliefs contradict with those of my superior | 25 | 53 | 31 | 12 | 9 | 1.43(1.11) |
| 20. | Unfair assessment from superiors | 31 | 40 | 29 | 19 | 11 | 1.53(1.24) |
| | Poor relationship with colleagues related stressors | | | | | | |
| 21. | Working with uncooperative colleagues | 40 | 41 | 27 | 13 | 9 | 1.30(1.20) |
| 22. | Working with incompetence of colleagues | 45 | 40 | 31 | 10 | 4 | 1.13(1.07) |
| 23. | Relationship problems with colleagues | 45 | 53 | 21 | 5 | 6 | 1.03(1.04) |
| 24. | Competition among colleagues | 44 | 54 | 24 | 5 | 3 | 0.99(0.94) |
| | Poor job prospects related stressors | | | | | | |
| 25. | Feeling insecure in my job | 29 | 48 | 27 | 15 | 11 | 1.46(1.20) |
| 26. | Society does not think highly of my profession | 40 | 35 | 28 | 12 | 15 | 1.43(1.32) |
| 27. | Lack of promotion prospects | 29 | 44 | 27 | 13 | 17 | 1.57(1.29) |
| 28. | Feeling of being underpaid | 14 | 23 | 34 | 25 | 34 | 2.32(1.32) |

*Degree of stress classification: 0 – 1.00 is 'causing nil to mild stress'; 1.01 – 2.00 is 'causing mild to moderate stress; 2.01 – 3.00 is 'causing moderate to high stress' and 3.01 – 4.00 is 'causing high to severe stress'

**DISCUSSION**

The response rate of our study was 95.5%, which is high compared to the study done by Saini N K et al which had a response rate of 77.5%.[11] This could be due to the lower numbers of post-graduate residents in our study site, leading to an increased willingness of the residents to express their unaddressed stress.

The prevalence of stress in our study was found to be 81.3%, as measured by K10 which is high compared to the study done by Saini N K et al (32.8%) and other previous studies (30-50%) conducted among university students (Yusoff et al 2010). [6]

Using the PSQ in our study, we discovered that severe stress was the most prevalent, accounting for more than one-third of the total study population, followed by mild and then moderate stress. Out of 130 resident doctors, 32 (24.6%) had mild stress, 26 (20%) had moderate stress, and 49 (37.7%) were severely stressed. Compared to a study conducted by NK Saini et al using the DASS scale on 930 resident doctors, 165 (17.7%) had mild stress, 113 (12.2%) had moderate stress, and 27 (2.9%) were severely stressed. This difference could be the result of the smaller population in our study and the tools used to assess the level of stress. [11]

According to our findings, mild and severe stress were the most prevalent and equally common levels of stress in men. Severe stress was most prevalent in females. This is in contrast to the study done by Madhavi Bhat et al. which showed moderate stress to be the most prevalent in both sex.[12] According to marital status, the severe level of stress had a similar ratio, while the mild level of stress was more prevalent in a single group. Thirteen residents, each single or married, had moderate levels of stress. LaxmiTellur et al., showed in their study that severe stress was seen in 13.4% of first-year residents.[13]Whereas in our study, we found the prevalence of severe levels of stress in first-year residents to be 32.6% and moderate stress levels to be the least common among them. In second-year residents, the most common level of stress was found to be severe in about 41 percent of the total of forty-four residents, followed by moderate in twelve and mild in eight. Faculty-wise, severe stress was found in 34.9% of all medical residents. This is comparable with the study conducted by PouryaFarhangi et al. on 152 residents, which showed the prevalence of severe stress in medical residents to be 33.8%. Severe stress was found to be in 42.5% of all surgical residents, which is higher than the study conducted by Qamar Riaz et al, which showed only 19.1% of all surgical residents were found to have severe stress.[14] This could be explained by the limited number of tertiary referral centers in the area leading to higher referrals to the study center for our study, causing an increased workload for the surgical residents. The prevalence of severe levels of stress (34.9%) in medical residents in our study is comparable with the study conducted by PouryaFarhangi et al. in 152 residents, which showed the prevalence of severe stress in medical residents to be 33.8%. [15]

Table 2, calculated from our study, ranks each stressor according to the degree of stress perceived by the residents. The most common stressor among all stressors is academy-related. The most common cause of stress in the study conducted by Yusoff et al 2010 was the tests/examinations (degree of stress mean (SD): 2.63 (1.00)), followed by a large amount of content to be learned (degree of stress mean (SD): 2.39 (1.04)). Whereas, in our study, time pressure and deadlines to meet (degree of stress mean (SD): 2.65 (0.995)) were the most prevalent causes of stress, followed by the large amount of content to be learned (degree of stress mean (SD): 2.58 (1.002). Tests/examinations (degree of stress mean (SD): 2.12 (0.948)) were not among the top three stressors. The finding could be due to a limited number of residents leading to a heavy workload with long working hours leading to sleep deprivation, an irregular schedule of new resident intake causing disparity in the number of residents at a point in time, a lack of effective communication and support systems between coworkers, and a lack of resident wellness programs.[12]

## LIMITATION

The sample size for this single-center-based study was not significantly large, implying that the study may not be applicable in all cases. The lower population can be considered the reason for the results to be statistically insignificant.

## CONCLUSION

Medical residency is a rigorous and demanding period of training for doctors following medical school graduation. Residents usually have to put in long hours, manage a high workload, and make important clinical decisions with limited experience, so it can be a stressful period. Medical institutions must implement supportive measures for their residents in order to address the problem of stress among medical residents. For tertiary care facilities to function at their best, residents must be in good physical and mental health. To improve their mental health and eliminate those stressors whenever possible, residents themselves should be aware of these stressors and actively seek assistance when necessary.

## FUNDINGS

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## CONFLICT OF INTEREST

None

## ETHICAL APPROVAL

The study was approved by Institutional Review Committee of Patan Academy of Health Sciences (Ref: drs2210181681)

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