



Original Article

## Prevalence of Depression, Anxiety, and Stress and its associated factors among postgraduate medical students of a tertiary care hospital: A Cross-sectional study

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### ABSTRACT

**Background:** Mental health disorders among medical trainees are a growing global concern. The purpose of this study was to assess the occurrence and related determinants of depression, anxiety, and stress in postgraduate at a tertiary care hospital in Gujarat, India.

**Methods:** A cross-sectional study was conducted among 157 postgraduate students (response rate: 89%) at C.U. Shah Medical College and Hospital, Surendranagar, from June to September 2024. Mental health status was evaluated using the Depression, Anxiety, and Stress Scale (DASS-42). A pre-tested semi-structured questionnaire gathered data on sociodemographic variables and potential contributing factors. The Chi-square test was used to identify associations.

**Results:** Depression, anxiety, and stress were prevalent in 10%, 14%, and 18% of students, respectively. Depression was significantly associated with female sex ( $p=0.009$ ), mother's education ( $p=0.003$ ), and living arrangement ( $p=0.005$ ). Anxiety was linked to the mother's education ( $p=0.005$ ) and parents' living status ( $p=0.03$ ). Stress was associated with age ( $p=0.004$ ) and mother's education ( $p=0.005$ ). Key predisposing factors included psychiatric history, duty hours, sleep patterns, failed exams, and specialty satisfaction.

**Conclusion:** Although the prevalence of depression, anxiety, and stress was relatively lower compared to earlier studies, a considerable proportion of students experienced psychological distress. These findings underscore the need for proactive institutional support, including regular mental health screenings, counselling services, and integration of wellness initiatives into the medical curriculum. Targeted interventions for vulnerable groups, especially female students and those with psychiatric histories, are strongly recommended.

**Keywords:** Depression, Anxiety, Stress, DASS-42, Mental health, Postgraduate medical students

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### INTRODUCTION

Postgraduate (PG) medical education is a challenging phase for physicians, as they have to manage their personal lives and economic demands and tend to the academic requirements stipulated by the institution [1]. Managing both personal life and meeting academic demands can lead to stress, which could lead to burnout, depression, anxiety, fatigue, poor sleep, and even substance abuse [2].

Medical post-graduates faced multiple challenges, including extended work hours, high-stakes responsibilities, academic pressures, reduced social support, and financial concerns [3]. These stressors can contribute to psychological distress that may manifest as depression, anxiety, and stress syndromes. Studies globally have consistently shown that healthcare professionals in individuals undergoing training experience higher rates of mental health issues than the general population. [4].

The prevalence of mental health disorders among medical postgraduates varies across different settings and populations. Research indicates that postgraduate medical students experience significant psychological distress, with some studies reporting depression rates between 15-30%, anxiety between 20-40%, and moderate to severe stress in 40-75% of residents [5]. A notable study found that 16.48% of medical postgraduate suffered from depression, and approximately 73% faced moderate stress [6].

The aetiology of psychological distress in this population is multifactorial, encompassing personal characteristics, educational environment, work-related factors, and systemic issues within medical training [7]. Recognizing the risk factors linked to depression, anxiety, and stress among postgraduate students is essential for designing targeted interventions and preventive strategies to effectively address these mental health issues [8].

Despite growing recognition of this issue, there remains a notable gap in research specifically examining the mental health status of postgraduate medical students in various regional contexts, particularly in tertiary care teaching hospitals in India. Gaining insight into the prevalence and associated factors of depression, anxiety, and stress in this population is vital for establishing effective support systems and implementing appropriate interventions [9].

This study aims to determine the prevalence and associated determinants of depression, anxiety, and stress among postgraduate students at a tertiary care hospital in Gujarat, India. By identifying the scope of the problem and its associated factors, this research seeks to inform evidence-based strategies to promote mental well-being among medical postgraduates and enhance the quality of medical education and healthcare delivery.

## **MATERIALS AND METHODS**

### **Study Design and Setting**

This cross-sectional study was conducted at C U Shah Medical College and Hospital, Surendranagar, Gujarat, India. It was carried out over four months, from June to September 2024. The cross-sectional design was selected because it allows for the simultaneous assessment of prevalence and associated factors, aligning with the study objectives.

### **Study Population and Sampling**

The study population comprised postgraduate students (junior resident doctors) from various clinical and non-clinical departments of the tertiary care hospital. Using a convenient sampling technique, Consented participate included in the study. Total 176 postgraduate students approached, 157 completed and submitted the questionnaires, yielding a response rate of 89%.

### **Sample Size**

The final sample size was 157 participants. This sample size was determined based on the total population of postgraduate students in the institution, with consideration for achieving adequate statistical power for the analyses of associated factors.

### **Depression, Anxiety, and Stress Scale (DASS-42)**

The primary assessment tool used was the Depression, Anxiety, and Stress Scale (DASS-42), a validated self-report instrument designed to measure the negative emotional states of depression, anxiety, and stress (14). The DASS-42 comprises 42 items, with 14 items allocated to each of the three subscales: depression, anxiety, and stress. Participants respond using a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). Higher scores reflect greater symptom severity. The DASS-42 has shown strong psychometric validity across various populations, including medical students.

### **Semi-structured Questionnaire**

A pre-tested semi-structured questionnaire was administered to gather information on socio-demographic characteristics and related variables potential predisposing factors for mental health issues. The questionnaire included items on:

- Socio-demographic variables: age, sex, year of postgraduate study, type of family, religion, parental education and occupation, marital status, and current living arrangement
- Academic factors: specialty/branch satisfaction, history of academic failure
- Work-related factors: daily duty hours
- Lifestyle factors: sleep patterns, substance use
- Personal and family medical history: personal or family history of psychiatric illness, family conflicts

The questionnaire was administered online through a secure digital platform to ensure convenience and privacy for participants .

### Ethical Considerations

The study protocol received approval from the Institutional Ethics Committee of C U Shah Medical College and Hospital [Approval No. IEC(HR)/RP-30/2024]. Informed consent was obtained from all participants prior to their inclusion in the study. Confidentiality of the participants was maintained throughout the research process .

### Data Collection Procedure

Participants were informed about the study objectives and assured about the confidentiality of their responses. Upon providing informed consent, participants completed the online survey consisting of the socio-demographic questionnaire and the DASS-42 scale. The survey was distributed electronically to all eligible postgraduate students.

### Statistical Analysis

Data were entered and analysed using Microsoft Excel version 2023. Descriptive statistics were used to summarize the socio-demographic characteristics and to determine the prevalence of depression, anxiety, and stress. Categorical variables were expressed as frequencies and percentages. Chi-square test was used to examine the associations between various socio-demographic factors, predisposing factors, and the presence of depression, anxiety, and stress. A p-value of <0.05 was considered statistically significant [20]. The analysis focused on identifying significant associations that could inform targeted interventions for improving mental health among postgraduate medical students.

## RESULTS

### Prevalence of Depression, Anxiety, and Stress

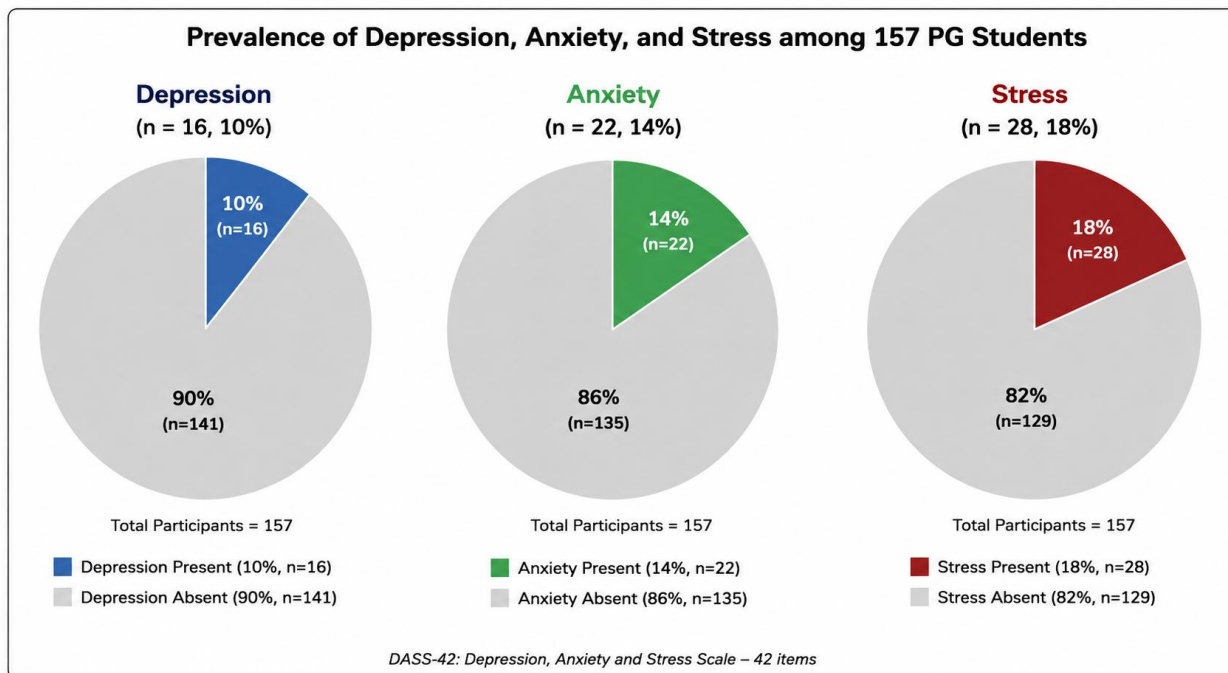


Figure: 1

Figure:1 illustrate prevalence of Depression Anxiety and Stress among postgraduate medical students, Out of the total 176 PG students approached, 157 submitted the completed questionnaires, yielding an overall response rate of 89%. Analysis of the DASS-42 scores revealed the prevalence of depression, anxiety, and stress among the participants was 10% (n=16), 14% (n=22), and 18% (n=28), respectively.

| Variable | Domain | Depression |            | Anxiety    |            | $\chi^2$ (p value) Depression | $\chi^2$ (p value) Anxiety |
|----------|--------|------------|------------|------------|------------|-------------------------------|----------------------------|
|          |        | Yes (n=16) | No (n=141) | Yes (n=22) | No (n=135) |                               |                            |
| Age      | 24-26  | 6(10%)     | 56(90%)    | 8(13%)     | 54(87%)    | 0.51 (0.77)                   | 0.25 (0.87)                |
|          | 27-29  | 9(12%)     | 69(88%)    | 12(15%)    | 66(85%)    |                               |                            |
|          | 30-32  | 1(6%)      | 16(94%)    | 2(12%)     | 15(88%)    |                               |                            |
| Sex      | Female | 11(18%)    | 50(82%)    | 10(16%)    | 51(84%)    | 6.70 (0.009) *                |                            |

|                                  |                  |         |          |         |          |                            |                            |
|----------------------------------|------------------|---------|----------|---------|----------|----------------------------|----------------------------|
|                                  | Male             | 5(5%)   | 91(95%)  | 12(13%) | 84(88%)  |                            | <b>0.46<br/>(0.493)</b>    |
| <b>Year of PG</b>                | 1st year         | 6(11%)  | 49(89%)  | 8(15%)  | 47(85%)  | <b>1.29 (0.52) *</b>       | <b>0.84 (0.65)<br/>*</b>   |
|                                  | 2nd year         | 3(6%)   | 45(94%)  | 5(10%)  | 43(90%)  |                            |                            |
|                                  | 3rd year         | 7(13%)  | 47(87%)  | 9(17%)  | 45(83%)  |                            |                            |
| <b>Head of family occupation</b> | Business         | 4(9%)   | 43(91%)  | 4(9%)   | 43(91%)  | <b>12.25<br/>(0.052) *</b> | <b>6.13 (0.10)<br/>*</b>   |
|                                  | Govt. job        | 6(15%)  | 33(85%)  | 9(23%)  | 30(77%)  |                            |                            |
|                                  | Private job      | 1(2%)   | 53(98%)  | 5(9%)   | 49(91%)  |                            |                            |
|                                  | Retired          | 5(29%)  | 12(71%)  | 4(24%)  | 13(76%)  |                            |                            |
| <b>Types of family</b>           | Joint            | 3(5%)   | 58(95%)  | 7(11%)  | 54(89%)  | <b>12.25<br/>(0.052) *</b> | <b>6.13 (0.10)<br/>*</b>   |
|                                  | Nuclear          | 12(14%) | 76(86%)  | 13(15%) | 75(85%)  |                            |                            |
|                                  | Three generation | 1(13%)  | 7(88%)   | 2(25%)  | 6(75%)   |                            |                            |
| <b>Religion</b>                  | Hindu            | 15(16%) | 132(84%) | 21(14%) | 126(86%) | <b>4.37 (0.22) *</b>       | <b>3.46 (0.32)<br/>*</b>   |
|                                  | Muslim           | 0(0%)   | 7(100%)  | 0(0%)   | 7(100%)  |                            |                            |
|                                  | Sikh             | 0(0%)   | 1(100%)  | 0(0%)   | 1(100%)  |                            |                            |
|                                  | Other            | 1(50%)  | 1(50%)   | 1(50%)  | 1(50%)   |                            |                            |
| <b>Father education</b>          | Illiterate       | 1(50%)  | 1(50%)   | 0(0%)   | 2(100%)  | <b>8.25 (0.21) *</b>       | <b>5.83 (0.44)<br/>*</b>   |
|                                  | Primary          | 0(0%)   | 3(100%)  | 0(0%)   | 3(100%)  |                            |                            |
|                                  | Secondary        | 0(0%)   | 3(100%)  | 1(33%)  | 2(67%)   |                            |                            |
|                                  | Higher sec.      | 1(5%)   | 19(95%)  | 1(5%)   | 19(95%)  |                            |                            |
|                                  | Graduate         | 10(10%) | 91(90%)  | 14(14%) | 87(86%)  |                            |                            |
|                                  | Post graduate    | 3(12%)  | 23(88%)  | 5(19%)  | 21(81%)  |                            |                            |
|                                  | Ph.D.            | 1(50%)  | 1(50%)   | 1(50%)  | 1(50%)   |                            |                            |
| <b>Mother Education</b>          | Illiterate       | 0(0%)   | 5(100%)  | 0(0%)   | 5(100%)  | <b>25.13<br/>(0.003) *</b> | <b>18.33<br/>(0.005) *</b> |
|                                  | Primary          | 3(38%)  | 5(63%)   | 4(50%)  | 4(50%)   |                            |                            |
|                                  | Secondary        | 1(3%)   | 35(97%)  | 3(8%)   | 33(92%)  |                            |                            |
|                                  | Higher sec.      | 1(2%)   | 56(98%)  | 4(7%)   | 53(93%)  |                            |                            |
|                                  | Graduate         | 9(20%)  | 37(80%)  | 9(20%)  | 37(80%)  |                            |                            |
|                                  | Post graduate    | 2(50%)  | 2(50%)   | 2(50%)  | 2(50%)   |                            |                            |
|                                  | Ph.D.            | 0(0%)   | 1(100%)  | 0(0%)   | 1(100%)  |                            |                            |
| <b>Locality</b>                  | Home             | 4(29%)  | 10(71%)  | 3(21%)  | 11(79%)  | <b>10.31<br/>(0.005) *</b> | <b>2.63<br/>(0.26) *</b>   |
|                                  | Hostel           | 9(7%)   | 123(93%) | 16(12%) | 116(88%) |                            |                            |
|                                  | Pay-in guest     | 3(27%)  | 8(73%)   | 3(27%)  | 8(73%)   |                            |                            |
| <b>Marital status</b>            | Married          | 3(18%)  | 14(82%)  | 3(18%)  | 14(82%)  | <b>1.15<br/>(0.56) *</b>   | <b>0.20<br/>(0.64) *</b>   |
|                                  | Unmarried        | 13(9%)  | 127(81%) | 19(14%) | 121(86%) |                            |                            |

**Table 1** presents the association between Depression, anxiety, and sociodemographic regarding the association between Depression and sociodemographic factors among the study participants. Gender was significantly associated with depression ( $\chi^2 = 6.70$ ,  $p = 0.009$ ), with females showing a higher prevalence (18%) compared to males (5%). Mother's education level demonstrated a significant association with depression ( $\chi^2 = 25.13$ ,  $p = 0.003$ ), with higher rates observed among participants whose mothers had primary education (38%) or postgraduate education (50%). The current living arrangement (locality) was also significantly associated with depression ( $\chi^2 = 10.31$ ,  $p = 0.005$ ), with participants living at home (29%) or as paying guests (27%) showing higher rates compared to those in hostels (7%).

Regarding the association between sociodemographic factors and anxiety, the analysis revealed a significant association between mothers' education and anxiety ( $\chi^2 = 18.33$ ,  $p = 0.005$ ), with higher prevalence observed among participants whose mothers had primary education (50%) or postgraduate education (50%). Parents' living status was also significantly associated with anxiety ( $\chi^2 = 10.30$ ,  $p = 0.03$ ), with higher rates observed among participants with deceased mothers (40%) or divorced parents (100%). Individual satisfaction with their chosen specialty branch showed a significant association with anxiety ( $\chi^2 = 8.26$ ,  $p = 0.01$ ), with higher rates among non-satisfied participants (40%) and those who did not answer this question (43%) compared to satisfied participants (12%).

| <b>Table 2: Association between sociodemographic factors and Stress (n=157)</b> |               |                   |                   |                                      |
|---|---------------|-------------------|-------------------|--------------------------------------|
| <b>Variable</b>   | <b>Domain</b> | <b>Yes (n=28)</b> | <b>No (n=129)</b> | <b><math>\chi^2</math> (p value)</b> |
| <b>Age</b>  | 24-26         | 17(27%)           | 45(73%)           | <b>10.91 (0.004) *</b>               |
|   | 27-29         | 6(8%)             | 72(92%)           |                                      |

|                           |                  |         |          |                 |
|---------------------------|------------------|---------|----------|-----------------|
|                           | 30-32            | 5(29%)  | 12(71%)  |                 |
| Sex                       | Female           | 11(18%) | 50(82%)  | 0.003 (0.95)    |
|                           | Male             | 17(18%) | 79(82%)  |                 |
| Year of PG                | 1st year         | 10(18%) | 45(82%)  | 0.06 (0.96)     |
|                           | 2nd year         | 8(17%)  | 40(83%)  |                 |
|                           | 3rd year         | 10(19%) | 44(81%)  |                 |
| Head of family occupation | Business         | 9(19%)  | 38(81%)  | 0.76 (0.85) *   |
|                           | Govt. job        | 7(18%)  | 32(82%)  |                 |
|                           | Private job      | 8(15%)  | 46(85%)  |                 |
|                           | Retired          | 4(24%)  | 13(76%)  |                 |
| Types of family           | Joint            | 12(20%) | 49(80%)  | 1.88 (0.38) *   |
|                           | Nuclear          | 16(18%) | 72(82%)  |                 |
|                           | Three generation | 0(0%)   | 8(100%)  |                 |
| Religion                  | Hindu            | 27(18%) | 120(82%) | 3.17 (0.36) *   |
|                           | Muslim           | 0(0%)   | 7(100%)  |                 |
|                           | Sikh             | 0(0%)   | 1(100%)  |                 |
|                           | Other            | 1(50%)  | 1(50%)   |                 |
| Father education          | Illiterate       | 0(0%)   | 2(100%)  | 5.83 (0.44) *   |
|                           | Primary          | 0(0%)   | 3(100%)  |                 |
|                           | Secondary        | 1(33%)  | 2(67%)   |                 |
|                           | Higher sec.      | 1(5%)   | 19(95%)  |                 |
|                           | Graduate         | 14(14%) | 87(86%)  |                 |
|                           | Post graduate    | 5(19%)  | 21(81%)  |                 |
|                           | Ph.D.            | 1(50%)  | 1(50%)   |                 |
| Mother Education          | Illiterate       | 0(0%)   | 5(100%)  | 18.33 (0.005) * |
|                           | Primary          | 4(50%)  | 4(50%)   |                 |
|                           | Secondary        | 3(8%)   | 33(92%)  |                 |
|                           | Higher sec.      | 4(7%)   | 53(93%)  |                 |
|                           | Graduate         | 9(20%)  | 37(80%)  |                 |
|                           | Post graduate    | 2(50%)  | 2(50%)   |                 |
|                           | Ph.D.            | 0(0%)   | 1(100%)  |                 |
| Locality                  | Home             | 3(21%)  | 11(79%)  | 2.63 (0.26) *   |
|                           | Hostel           | 16(12%) | 116(88%) |                 |
|                           | Pay-in guest     | 3(27%)  | 8(73%)   |                 |
| Marital status            | Married          | 3(18%)  | 14(82%)  | 0.20 (0.64) *   |
|                           | Unmarried        | 19(14%) | 121(86%) |                 |

**Table 2** presents the association between sociodemographic factors and stress. Age was significantly associated with stress ( $\chi^2 = 10.91$ ,  $p = 0.004$ ), with higher prevalence observed among the 24-26 years age group (27%) and 30-32 years age group (29%) compared to the 27-29 years age group (8%). Mother's education level also showed a significant association with stress ( $\chi^2 = 18.33$ ,  $p = 0.005$ ), with higher rates among participants whose mothers had primary education (50%) or postgraduate education (50%).

| Variables                      | Response | Depression     |                     | Anxiety        |                     | $\chi^2$ (p-value) Depression | $\chi^2$ (p-value) Anxiety |
|--------------------------------|----------|----------------|---------------------|----------------|---------------------|-------------------------------|----------------------------|
|                                |          | Present (n=16) | Not present (n=141) | Present (n=22) | Not present (n=135) |                               |                            |
| H/o psychiatric illness        | No       | 15(10%)        | 141(90%)            | 21(13%)        | 135(87%)            | 8.86 (0.002) *                | 6.17 (0.01) *              |
|                                | Yes      | 1(100%)        | 0(0%)               | 1(100%)        | 0(0%)               |                               |                            |
| Family H/o psychiatric illness | No       | 13(9%)         | 129(91%)            | 19(13%)        | 123(87%)            | 1.74 (0.18) *                 | 0.49 (0.48) *              |
|                                | Yes      | 3(20%)         | 12(80%)             | 3(20%)         | 12(80%)             |                               |                            |
| Any Substance Abuse            | No       | 15(11%)        | 127(89%)            | 19(13%)        | 123(87%)            | 0.22 (0.63) *                 | 0.49 (0.48) *              |
|                                | Yes      | 1(7%)          | 14(93%)             | 3(20%)         | 12(80%)             |                               |                            |
| Family conflict at home        | No       | 13(9%)         | 127(91%)            | 20(14%)        | 120(86%)            | 1.15 (0.28) *                 | 0.08 (0.77) *              |
|                                | Yes      | 3(18%)         | 14(82%)             | 2(12%)         | 15(88%)             |                               |                            |

|   |                        |         |          |         |          |                       |                       |
|---|------------------------|---------|----------|---------|----------|-----------------------|-----------------------|
| <b>Parents living status</b>                    | <b>Both Present</b>    | 14(10%) | 129(90%) | 19(13%) | 124(87%) | <b>10.27 (0.03) *</b> | <b>10.30 (0.03) *</b> |
|   | <b>Father deceased</b> | 1(20%)  | 4(80%)   | 0(0%)   | 5(100%)  |                       |                       |
|   | <b>Mother deceased</b> | 0(0%)   | 5(100%)  | 2(40%)  | 3(60%)   |                       |                       |
|   | <b>Both deceased</b>   | 0(0%)   | 3(100%)  | 0(0%)   | 3(100%)  |                       |                       |
|   | <b>Divorcee</b>        | 1(100%) | 0(0%)    | 1(100%) | 0(0%)    |                       |                       |
| <b>Duty hours (per day)</b>                     | <b>&lt;8 hours</b>     | 1(14%)  | 6(86%)   | 0(0%)   | 7(100%)  | <b>9.51 (0.008) *</b> | <b>1.62 (0.44) *</b>  |
|   | <b>&gt;12 hours</b>    | 7(6%)   | 110(94%) | 16(14%) | 101(86%) |                       |                       |
|   | <b>8-12 hours</b>      | 8(24%)  | 25(76%)  | 6(18%)  | 27(82%)  |                       |                       |
| <b>Duty hours (per day)</b>                     | <b>&lt;8 hours</b>     | 1(14%)  | 6(86%)   | 0(0%)   | 7(100%)  | <b>9.51 (0.008) *</b> | <b>1.62 (0.44) *</b>  |
|   | <b>&gt;12 hours</b>    | 7(6%)   | 110(94%) | 16(14%) | 101(86%) |                       |                       |
|   | <b>8-12 hours</b>      | 8(24%)  | 25(76%)  | 6(18%)  | 27(82%)  |                       |                       |
| <b>Failed in the Past exam</b>                  | <b>Not</b>             | 14(10%) | 133(90%) | 19(13%) | 128(87%) | <b>1.12 (0.28) *</b>  | <b>2.26 (0.13) *</b>  |
|   | <b>Yes</b>             | 2(20%)  | 8(80%)   | 3(30%)  | 7(70%)   |                       |                       |
| <b>Daily Hours of Sleep</b>                     | <b>&lt;7 hours</b>     | 7(6%)   | 107(94%) | 16(14%) | 98(86%)  | <b>7.95 (0.01) *</b>  | <b>0.16 (0.92) *</b>  |
|   | <b>&gt;9 hours</b>     | 0(0%)   | 1(100%)  | 0(0%)   | 1(100%)  |                       |                       |
|   | <b>7-9 hours</b>       | 9(21%)  | 33(79%)  | 6(14%)  | 36(86%)  |                       |                       |
| <b>Individual satisfaction with this branch</b> | <b>Non satisfied</b>   | 0(0%)   | 5(100%)  | 2(40%)  | 3(60%)   | <b>18.00 (0.01) *</b> | <b>8.26 (0.01) *</b>  |
|   | <b>Not Answered</b>    | 4(57%)  | 3(43%)   | 3(43%)  | 4(57%)   |                       |                       |
|   | <b>Satisfied</b>       | 12(8%)  | 133(92%) | 17(12%) | 128(88%) |                       |                       |

**Table 3** presents the association between Depression, Anxiety, and Predisposing Factors. Regarding the association between Depression and Predisposing factor this study revealed that a Personal history of psychiatric illness demonstrated a significant association with depression ( $\chi^2 = 8.86, p = 0.002$ ), with 100% of participants with prior psychiatric history experiencing depression. Parents' living status showed a significant association ( $\chi^2 = 10.27, p = 0.03$ ), with higher rates among participants with deceased fathers (20%) or divorced parents (100%). Daily duty hours were significantly associated with depression ( $\chi^2 = 9.51, p = 0.008$ ), with higher prevalence among those working 8-12 hours per day (24%) compared to those working <8 hours (14%) or >12 hours (6%). Daily hours of sleep showed significant association ( $\chi^2 = 7.95, p = 0.01$ ), with higher rates among participants sleeping 7-9 hours (21%) compared to those sleeping <7 hours (6%). Individual satisfaction with chosen specialty branch was also significantly associated with depression ( $\chi^2 = 18.00, p = 0.01$ ), with higher rates among participants who did not answer this question (57%) compared to satisfied participants (8%).

Regarding the association between predisposing factors and anxiety. Personal history of psychiatric illness demonstrated a significant association ( $\chi^2 = 6.17, p = 0.01$ ), with 100% of participants with prior psychiatric history experiencing anxiety. Parents' living status showed significant association ( $\chi^2 = 10.30, p = 0.03$ ), with higher rates among participants with deceased mothers (40%) or divorced parents (100%). Individual satisfaction with chosen specialty branch was also significantly associated with anxiety ( $\chi^2 = 8.26, p = 0.01$ ), with higher rates among non-satisfied participants (40%) and those who did not answer this question (43%) compared to satisfied participants (12%).

| <b>Variables</b>                      | <b>Response</b>        | <b>Stress</b>         |                       | <b><math>\chi^2</math> (p value) Stress</b> |
|---------------------------------------|------------------------|-----------------------|-----------------------|---|
|                                       |                        | <b>Present (n=28)</b> | <b>Absent (n=129)</b> |   |
| <b>H/o any psychiatric illness</b>    | <b>No</b>              | 28(18%)               | 128(82%)              | <b>0.21 (0.64) *</b>                        |
|                                       | <b>Yes</b>             | 0(0%)                 | 1(100%)               |   |
| <b>Family H/o psychiatric illness</b> | <b>No</b>              | 27(19%)               | 115(81%)              | <b>1.41 (0.23) *</b>                        |
|                                       | <b>Yes</b>             | 1(7%)                 | 14(93%)               |   |
| <b>Substance Abuse?</b>               | <b>No</b>              | 25(18%)               | 117(82%)              | <b>0.05 (0.81) *</b>                        |
|                                       | <b>Yes</b>             | 3(20%)                | 12(80%)               |   |
| <b>Family conflict at home</b>        | <b>No</b>              | 24(17%)               | 116(83%)              | <b>0.42 (0.51) *</b>                        |
|                                       | <b>Yes</b>             | 4(24%)                | 13(76%)               |   |
| <b>Parents living status</b>          | <b>Both Present</b>    | 25(17%)               | 118(83%)              | <b>3.48 (0.48) *</b>                        |
|                                       | <b>Father deceased</b> | 0(0%)                 | 5(100%)               |   |

|   |                        |         |          |                      |
|---|------------------------|---------|----------|----------------------|
|   | <b>Mother deceased</b> | 2(40%)  | 3(60%)   |                      |
|   | <b>Both deceased</b>   | 1(33%)  | 2(67%)   |                      |
|   | <b>Divorcee</b>        | 0(0%)   | 1(100%)  |                      |
| <b>Duty hours (per day)</b>                     | <b>&lt;8 hours</b>     | 4(57%)  | 3(43%)   | <b>7.74 (0.02) *</b> |
|   | <b>&gt;12 hours</b>    | 19(16%) | 98(84%)  |                      |
|   | <b>8-12 hours</b>      | 5(15%)  | 28(85%)  |                      |
| <b>Failed in Past exam</b>                      | <b>No</b>              | 24(16%) | 123(84%) | <b>3.58 (0.05) *</b> |
|   | <b>Yes</b>             | 4(40%)  | 6(60%)   |                      |
| <b>Daily Hours of sleep</b>                     | <b>&lt;7 hours</b>     | 18(16%) | 96(84%)  | <b>1.56 (0.45) *</b> |
|   | <b>&gt;9 hours</b>     | 0(0%)   | 1(100%)  |                      |
|   | <b>7-9 hours</b>       | 10(24%) | 32(76%)  |                      |
| <b>Individual satisfaction with this branch</b> | <b>Non satisfied</b>   | 1(20%)  | 4(80%)   | <b>3.17 (0.20) *</b> |
|   | <b>Not Answered</b>    | 3(43%)  | 4(57%)   |                      |
|   | <b>Satisfied</b>       | 24(17%) | 121(83%) |                      |

**Table 4** presents the association between predisposing factors and stress. Daily duty hours showed significant association with stress ( $\chi^2 = 7.74$ ,  $p = 0.02$ ), with higher prevalence among participants working <8 hours per day (57%) compared to those working 8-12 hours (15%) or >12 hours (16%). History of failing past examinations was significantly associated with stress ( $\chi^2 = 3.58$ ,  $p = 0.05$ ), with higher rates among participants who had previously failed exams (40%) compared to those who had not (16%).

## DISCUSSION

The present study aimed to assess the prevalence and associated factors of depression, anxiety, and stress among postgraduate medical students at a tertiary care hospital in Gujarat, India. The results indicated prevalence rates of 10% for depression, 14% for anxiety, and 18% for stress among the participants. These findings add to the expanding body of literature on mental health challenges faced by medical trainees: Prevalence of Depression, Anxiety, and Stress. The prevalence rates observed in our study are notably lower than those reported in several previous studies. Iqbal et al. [1] reported substantially higher prevalence rates of depression (51.3%), anxiety (66.9%), and stress (53%) among medical undergraduate students in India using the same assessment tool (DASS-42). Similarly, Siddharth et al. [2] in their systematic review of studies from India, found higher rates of depression (ranging from 8.7% to 71.3%), anxiety (ranging from 27.7% to 66.9%), and stress (ranging from 13.1% to 87.4%) among medical students. The observed differences might be attributed to variations in study settings, curriculum structures, institutional support systems, and cultural contexts. [3]

The relatively lower prevalence in our study might reflect the positive impact of institutional support systems, mentorship programs, or less competitive academic environment at our institution. Alternatively, it might indicate potential underreporting due to stigma associated with mental health issues among healthcare professionals or fear of professional consequences. [4] Several studies have highlighted those medical students and professionals are often reluctant to disclose mental health problems due to concerns about confidentiality, potential impact on career progression, and perception by colleagues [5]

## Gender Differences

Our study found a significantly higher prevalence of depression among female postgraduate students (18%) compared to their male counterparts (5%). This finding aligns with previous research by Sidharth et al. [2] who also reported a higher prevalence of mental health issues among female medical students. Similar gender disparities have been documented in studies by Dahlin et al. [6] and Fauzi et al. [7], suggesting that female medical students may be more vulnerable to psychological distress.

The gender disparity in depression prevalence observed in our study may be attributed to multiple factors. Women in medical education often face additional stressors, including gender bias, work-family conflicts, and sometimes harassment or discrimination [8]. Additionally, sociocultural factors and gender-role expectations may contribute to increased psychological vulnerability among female medical students [9]. Furthermore, women may also have different coping mechanisms or higher rates of reporting psychological symptoms compared to men [10].

## Impact of Sociodemographic Factors

Our study identified several sociodemographic factors significantly associated with mental health outcomes among postgraduate students. Mother's education emerged as a significant factor associated with all three mental health outcomes (depression, anxiety, and stress). This finding is interesting and might reflect the influence of parental educational

background on students' academic expectations, coping resources, and psychological resilience [11]. The complex relationship between parental education and offspring's mental health has been previously documented in the literature, with mixed findings on the direction of association [12]. Current living arrangement was significantly associated with depression, with participants living at home or as paying guests showing higher rates compared to those in hostels. This finding contrasts with some previous studies that have suggested living away from family might increase psychological distress [13]. The protective effect of hostel living observed in our study might be related to the peer support, shared experiences, and social networking opportunities available in hostel environments [14].

Age was significantly associated with stress, with higher prevalence observed among the youngest (24-26 years) and oldest (30-32 years) age groups. This U-shaped relationship might reflect the specific challenges faced at different stages of postgraduate training. Junior residents might experience stress related to transitioning from undergraduate to postgraduate training and adapting to new responsibilities, while senior residents might face stress related to career decisions, competitive job markets, and sometimes family responsibilities [15].

### **Influence of Predisposing Factors**

Several predisposing factors showed significant associations with mental health outcomes in our study. Personal history of psychiatric illness was significantly associated with both depression and anxiety, which aligns with existing literature on the recurrent nature of many psychiatric conditions and vulnerability to psychological distress [16]. This finding highlights the importance of providing targeted support for students with pre-existing mental health conditions.

Parents' living status emerged as a significant factor associated with both depression and anxiety. Participants with divorced parents or deceased parents showed higher rates of psychological distress, suggesting that family structure and support play crucial roles in students' mental wellbeing [17]. In previous studies, family support has been consistently identified as a protective factor against psychological distress among medical students [18].

Daily duty hours showed complex associations with mental health outcomes. Interestingly, participants working moderate hours (8-12 hours) had higher rates of depression compared to those working longer hours (>12 hours). This counterintuitive finding might reflect differences in specialty choices, work environments, or individual coping mechanisms [19]. Similarly, stress was more prevalent among participants working fewer hours (<8 hours), which might be related to specific characteristics of their training programs or personal circumstances. Sleep patterns were significantly associated with depression, with higher rates observed among participants sleeping 7-9 hours compared to those sleeping less than 7 hours. This finding contrasts with the established literature on sleep deprivation and mental health [20]. The unexpected association might be related to other confounding factors not captured in the analysis, such as quality of sleep, use of sleep medications, or chronotype differences.

### **Specialty Satisfaction and Mental Health**

Individual satisfaction with the chosen specialty branch was significantly associated with depression and anxiety. Participants who did not express satisfaction with their specialty choice or did not answer this question had substantially higher rates of psychological distress compared to satisfied participants. This finding is consistent with previous studies that have highlighted the importance of specialty fit and career satisfaction in medical trainees' wellbeing [21]. Shah and Trivedi [22] emphasized that discrepancies between expectations and reality in specialty training can lead to significant psychological distress among medical trainees.

### **Strengths and Limitations**

The strengths of our study include the use of a validated assessment tool (DASS-42), a good response rate (89%), and a comprehensive assessment of multiple potential associated factors. However, several limitations should be considered when interpreting the findings. The cross-sectional design precludes establishing causal relationships between the identified factors and mental health outcomes. The use of self-report measures might be subject to reporting biases. Additionally, the study was conducted at a single institution, which might limit the generalizability of the findings to other settings.

### **Recommendations**

These findings underscore the need for regular mental health screening among postgraduate medical students, particularly vulnerable groups such as female students and those with family-related challenges. Interventions should address both academic and non-academic stressors, including family support, living arrangements, and specialty satisfaction. Establishing dedicated counselling services, integrating mental health and self-care training into the curriculum, promoting health-enhancing activities, and implementing mentorship programs may improve student well-being. Future longitudinal studies are needed to clarify the temporal relationships between associated factors and mental health outcomes.

### **CONCLUSION**

This cross-sectional study demonstrated prevalence rates of 10%, 14%, and 18% for depression, anxiety, and stress, respectively, among postgraduate medical students at a tertiary care hospital in Gujarat. Female gender, mother's education level, age, living arrangement, parental living status, personal history of psychiatric illness, daily duty hours, sleep patterns, and specialty satisfaction were significantly associated with one or more mental health outcomes. These findings highlight

the multifactorial determinants of psychological distress and emphasize the need for targeted mental health support, including counselling services, self-care training, and interventions addressing academic and lifestyle-related stressors. Although limited by its cross-sectional design and single-centre setting, the study contributes to the growing evidence on mental health among medical trainees and underscores the need for longitudinal, multi-institutional research to inform effective preventive strategies.

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