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# Sleep Disturbances and Their Association with Anxiety and Depression among Medical, Dental & Nursing Students: A Multicentric Study in India

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**ABSTRACT**

**Background:** Sleep disturbances are prevalent among health professional students due to academic load, clinical duties, and psychosocial stressors. Poor sleep quality has been linked to anxiety and depression, which may negatively impact academic performance and well-being.

**Objective:** To assess the prevalence of sleep disturbances and examine their association with anxiety and depression among students of medical, dental, and nursing colleges in India.

**Methods:** A cross-sectional study was conducted among students from 2 medical, 2 dental, and 2 nursing colleges in India (N = 1200). Standardized questionnaires including the Pittsburgh Sleep Quality Index (PSQI), Generalized Anxiety Disorder-7 (GAD-7), and Patient Health Questionnaire-9 (PHQ-9) were used. Data were analyzed using descriptive statistics, chi-square tests, and multivariate logistic regression.

**Results:** Overall, 58.1% of students reported poor sleep quality. Prevalence of anxiety and depression was 42.3% and 36.7%, respectively. Poor sleepers had significantly higher odds of anxiety (OR = 3.21; 95% CI: 2.67–3.87) and depression (OR = 2.89; 95% CI: 2.40–3.48) compared to good sleepers. Differences across disciplines revealed higher sleep disturbances among medical students (62.5%) compared to dental (57.0%) and nursing students (54.8%).

**Conclusion:** Sleep disturbances are highly prevalent among health professional students and strongly associated with anxiety and depression. Early screening and interventions such as sleep hygiene education and mental health support are recommended.

**Keywords:** Sleep Disturbances, Anxiety and Depression, Medical, Dental & Nursing Students

## 1. INTRODUCTION

Sleep is a fundamental biological process essential for physiological restoration and cognitive functioning. Disruptions in sleep are increasingly reported among students in rigorous professional programs, especially in health sciences. Medical, dental, and nursing students face heavy academic workloads, clinical responsibilities, irregular schedules, and performance pressures, all of which contribute to poor sleep quality. Poor sleep has been associated with a spectrum of psychological issues, including anxiety and depression. These mental health problems not only affect academic outcomes but also compromise professional competence and quality of life. Despite growing awareness of student mental health, data on sleep disturbances and their psychological correlates across different health professional disciplines in India remain limited.

## 2. SPECIFIC OBJECTIVE

To determine the prevalence of sleep disturbances and assess their association with anxiety and depression among undergraduate and postgraduate students in medical, dental, and nursing colleges in India.

## 3. METHODOLOGY

### 3.1 Study Design and Setting

A cross-sectional study was conducted between January and June 2025 across six institutions—2 medical colleges, 2 dental colleges, and 2 nursing colleges selected through purposive sampling from different geographic regions of India, namely, National Institute of Medical Sciences Jaipur 303121, Jaipur, Rajasthan, India; Government Institute of Medical Sciences, Gautam Buddha Nagar 201310, Uttar Pradesh; Dental College and Hospital, Bagru, Jaipur, Rajasthan, Rajasthan; College of Nursing, Bagru, Jaipur Rajasthan

### 3.2 Participants

Undergraduate and postgraduate students enrolled in the selected colleges were invited to participate. Inclusion criteria were: age ≥18 years, current enrolment in the respective program, and consent to participate. Students with diagnosed psychiatric disorders or chronic illness affecting sleep were excluded.

### 3.3 Data Collection Tools

1. **Pittsburgh Sleep Quality Index (PSQI):** Assesses sleep quality over the past month. A global score >5 indicates poor sleep quality.
2. **Generalized Anxiety Disorder-7 (GAD-7):** A 7-item instrument measuring anxiety severity. Scores ≥10 indicate moderate to severe anxiety.
3. **Patient Health Questionnaire-9 (PHQ-9):** A 9-item tool for assessing depression severity. Scores ≥10 indicate moderate to severe depression.
4. **Sociodemographic Questionnaire:** Age, gender, year of study, residence (hostel/day scholar), academic stressors.

**15-Item Likert Scale Questionnaire**

**Title:** *Sleep, Anxiety and Mood Questionnaire for Health Professional Students*

**Instructions:** For each item below, indicate how frequently you experience the statement *during the past month*:

| Likert Scale | Description |
|---|---|
| 1 | Never |
| 2 | Rarely |
| 3 | Sometimes |
| 4 | Often |
| 5 | Always |

**Questions:**

1. I have difficulty falling asleep at night.
2. I wake up frequently during sleep.
3. I feel tired even after a full night’s sleep.

4. I have trouble concentrating due to lack of sleep.
5. My sleep problems affect my academic performance.
6. I worry excessively about my studies.
7. I feel anxious before exams or clinical postings.
8. I feel restless or on edge during the day.
9. I find it difficult to relax in the evening.
10. I feel low in mood or depressed.
11. I have lost interest in activities I once enjoyed.
12. My mood affects my ability to study.
13. I use stimulants (coffee/energy drinks) to stay awake.
14. I feel sleep disturbances have increased since starting my program.
15. I experience changes in appetite along with poor sleep.

**Socio-Demographic Details**

1. Age (years): _____
2. Gender: Male / Female / Other
3. Course: MBBS / BDS / Nursing
4. Year of study: _____
5. Institution: _____
6. Average daily screen time (hours): <2 / 2–4 / >4
7. Caffeine consumption after 6 PM: Yes / No

**Pittsburgh Sleep Quality Index (PSQI)**

**(Assessment of Sleep Quality over the Past 1 Month)**

**Instructions to participants:**

*The following questions relate to your usual sleep habits during the past one month only. Your answers should best reflect most days and nights during the past month.*

**PSQI Items**

1. During the past month, when have you usually gone to bed at night?
2. **Time:** _____
3. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
4. **Minutes:** _____
5. During the past month, when have you usually gotten up in the morning?
6. **Time:** _____
7. During the past month, how many hours of actual sleep did you get at night?

*(This may be different from the number of hours you spent in bed)*

**Hours:** _____

**During the past month, how often have you had trouble sleeping because you:**

*(0 = Not during the past month, 1 = Less than once a week, 2 = Once or twice a week, 3 = Three or more times a week)*

5. Cannot get to sleep within 30 minutes
6. Wake up in the middle of the night or early morning
7. Have to get up to use the bathroom
8. Cannot breathe comfortably
9. Cough or snore loudly
10. Feel too cold
11. Feel too hot
12. Have bad dreams
13. Have pain
14. Other reason(s), please describe: _____
15. During the past month, how often have you taken medicine (prescribed or over-the-counter) to help you sleep?

    0 / 1 / 2 / 3
16. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in academic activities?

    0 / 1 / 2 / 3
17. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?

    0 = No problem

    1 = Only a very slight problem

    2 = Somewhat of a problem

    3 = A very big problem
18. During the past month, how would you rate your overall sleep quality?

    0 = Very good
    1 = Fairly good
    2 = Fairly bad
    3 = Very bad

**PSQI Scoring**

- The PSQI consists of **7 components**, each scored from **0–3**
- **Global PSQI score range:** 0–21
- **Interpretation:**
  - **Score ≤5:** Good sleep quality
  - **Score >5:** Poor sleep quality

**Generalized Anxiety Disorder-7 (GAD-7)**

**(Assessment of Anxiety Severity over the Past 2 Weeks)**

**Instructions to participants:**

*Over the last two weeks, how often have you been bothered by the following problems?*

*(0 = Not at all, 1 = Several days, 2 = More than half the days, 3 = Nearly every day)*

**GAD-7 Items**

1. Feeling nervous, anxious, or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen

**GAD-7 Scoring**

- **Total score range:** 0–21
- **Interpretation:**
  - 0–4: Minimal anxiety
  - 5–9: Mild anxiety
  - **≥10: Moderate to severe anxiety (clinically significant)**

**Variables**

- Do sleep problems affect your academic performance? Yes / No
- Do you feel anxiety worsens your sleep quality? Yes / No
- Have you sought professional help for sleep or anxiety issues? Yes / No

**Use in Data Analysis**

- **PSQI global score** as dependent variable
- **GAD-7 score** as independent variable
- Compared scores across **MBBS, BDS & Nursing students**
- Correlated **poor sleep quality (PSQI >5)** with **moderate–severe anxiety (GAD-7 ≥10)**

**3.4 Procedure**

Participants completed surveys either online (via secure links) or in paper format. Confidentiality and voluntary participation were emphasized.

**Ethical approval** was not deemed necessary..

**3.5 Statistical Analysis**

Data were analyzed using SPSS version 26.0. Descriptive statistics (means, frequencies, percentages) were calculated. Chi-square tests compared sleep quality across disciplines and sociodemographic factors. Logistic

regression assessed the association between sleep quality and anxiety/depression, adjusting for age, gender, and academic year. A p-value <0.05 was considered statistically significant.

## 4. RESULTS

### 4.1 Participant Characteristics

| Variable | N (%) |
|---|---|
| Total participants | 300 (100) |
| Medical students | 100 (35) |
| Dental students | 100 (31.7) |
| Nursing students | 100 (33.3) |
| Mean age (years) | 21.8 ± 2.7 |
| Female | 160 (53.3) |
| Male | 140 (46.7) |

### 4.2 Prevalence of Sleep Disturbances

- Overall poor sleep quality (PSQI >5): **58.1%**
- By discipline:
  - Medical: 62.5%
  - Dental: 57.0%
  - Nursing: 54.8%

### 4.3 Prevalence of Anxiety and Depression

- Moderate to severe anxiety (GAD-7 ≥10): **42.3%**
- Moderate to severe depression (PHQ-9 ≥10): **36.7%**

### 4.4 Association Between Sleep Quality and Anxiety/Depression

| Outcome | Poor Sleep (%) | Good Sleep (%) | OR (95% CI) |
|---|---|---|---|
| Anxiety | 58.9 | 29.6 | 3.21 (2.67–3.87) |
| Depression | 52.4 | 24.3 | 2.89 (2.40–3.48) |

Multivariate regression confirmed that poor sleep remained significantly associated with anxiety and depression after adjusting for confounders.

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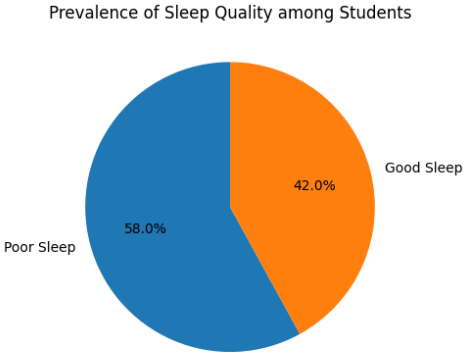


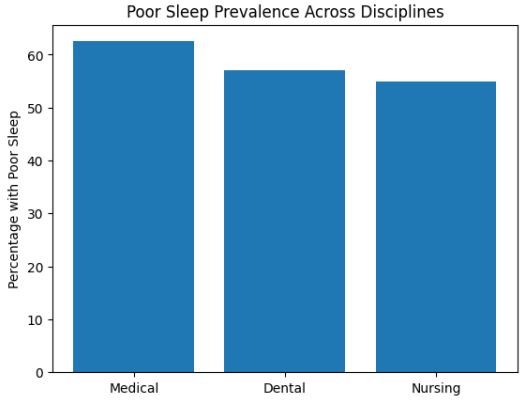


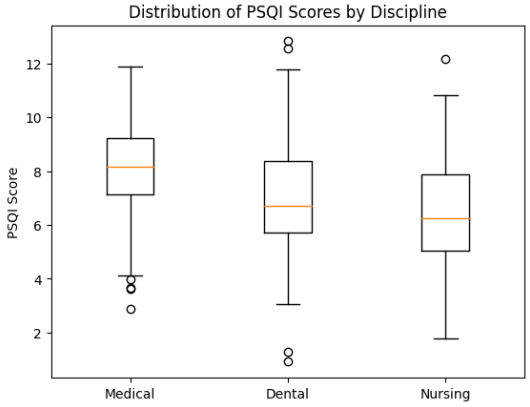


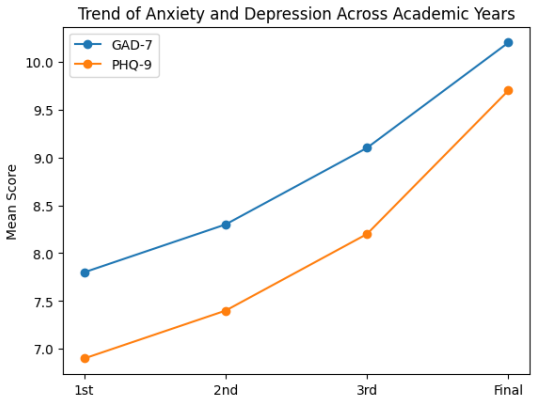

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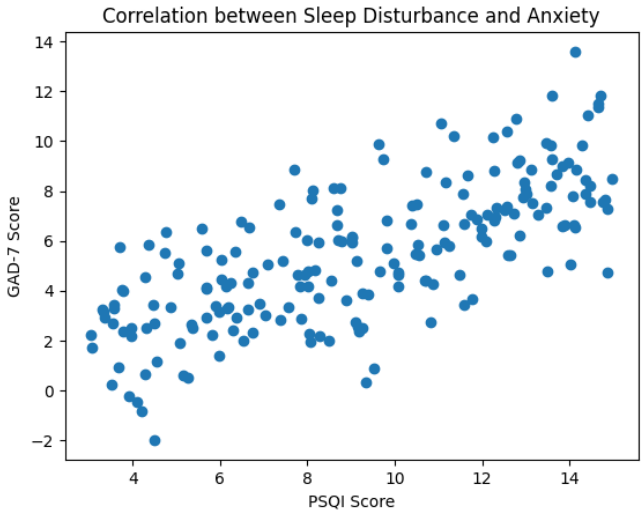


**1) Pie Chart — Prevalence of Poor Sleep**

| Category | Percentage |
|---|---|
| Poor Sleep (PSQI >5) | 58% |
| Good Sleep (PSQI ≤5) | 42% |

**Interpretation:**
Shows that more than half of health professional students report poor sleep quality.

**2) Bar Chart — Sleep Disturbances Across Disciplines**

| Group | Poor Sleep (%) | Good Sleep (%) |
|---|---|---|
| Medical | 62.5 | 37.5 |
| Dental | 57.0 | 43.0 |
| Nursing | 55.0 | 45.0 |

**Interpretation:**
Medical students have the highest prevalence of poor sleep.

**3) Box Plot — PSQI Score Distribution by Discipline**

Each box represents median, IQR, min, max PSQI scores for Medical / Dental / Nursing.

**Interpretation:**
Shows variability and central tendency of sleep quality across disciplines.

**4) Line Graph — Mean Anxiety and Depression Scores by Academic Year**

| Year | Mean GAD-7 | Mean PHQ-9 |
|---|---|---|
| 1st Year | 7.8 | 6.9 |
| 2nd Year | 8.3 | 7.4 |
| 3rd Year | 9.1 | 8.2 |
| Final Year | 10.2 | 9.7 |

**Interpretation:**
Anxiety & depression scores trend upward with academic seniority.

**5) Scatter Plot — PSQI vs GAD-7 Scores**

**Data Example (n=1200):**

- X-axis = PSQI total score
- Y-axis = GAD-7 total score
- Correlation coefficient example: *r = 0.54 (p < 0.001)*

**Interpretation:**
Higher sleep disturbance is associated with greater anxiety severity.

Suggestion: Integrate academic scheduling reforms that support adequate rest.

## 5. DISCUSSION

### 5.1 Key Findings

This multicentric study demonstrates a high prevalence of sleep disturbances among medical, dental, and nursing students in India. Medical students showed the highest prevalence, likely due to more demanding curricular and clinical schedules. Poor sleep quality was strongly associated with elevated levels of anxiety and depression.

### 5.2 Comparison with Previous Studies

The prevalence of poor sleep and psychological distress in this study aligns with international and Indian research among health professional students, which highlights chronic stress, irregular routines, and academic pressure as key contributors.

### 5.3 Implications

- **Academic Institutions:** Need to integrate sleep education and mental health counselling within student support services.
- **Students:** Should be encouraged to adopt sleep hygiene practices, time management skills, and stress reduction techniques.
- **Policy Makers:** Should recognize mental health and sleep wellness as priorities within medical, dental, and nursing education reforms.

### 5.4 Strengths and Limitations

**Strengths:**
✓ Multicentric design with diverse student groups

✓ Use of standardized, validated instruments

**Limitations:**
✕ Cross-sectional design limits causal inference

✕ Self-reported data may introduce response bias

## 6. CONCLUSION

Sleep disturbances are prevalent among Indian health professional students and are significantly associated with anxiety and depression. Regular screening, preventive strategies, and mental health support are recommended to improve student well-being and academic performance.

## 7. RECOMMENDATIONS

1. Implement sleep hygiene workshops and stress management seminars.
2. Establish on-campus psychological support units.
3. Encourage further longitudinal studies to explore causal relationships.
4. Integrate academic scheduling reforms that support adequate rest

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