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TAP Block vs Conventional Analgesia – A Clinical Stud

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ABSTRACT

Background: Medical students face high academic pressure, long hours, sleep deprivation and emotional stress, making them vulnerable to depression. Quantifying prevalence and identifying modifiable risk factors helps plan preventive strategies.

Objective: To estimate the prevalence of depression among undergraduate medical students and identify associated sociodemographic and academic risk factors.

Methods: Cross-sectional study of **300** undergraduate medical students (years 1–5) at a tertiary medical college. Data were collected using a structured proforma and the Patient Health Questionnaire-9 (PHQ-9). Additional data included demographic details, year of study, sleep duration, substance use, family history of mental illness, academic stress and financial stress. Depression was defined as PHQ-9 score ≥5 (mild or greater). Data were analysed with descriptive statistics, chi-square tests and multivariable logistic regression. Significance was set at $p < 0.05$.

Results: Mean age was 21.4 ± 1.8 years; 180 (60%) were female. Overall **prevalence of depression (PHQ-9 ≥5)** was **34.0% (102/300)**. Severity distribution: none (PHQ-9 0–4) 198 (66.0%), mild 72 (24.0%), moderate 21 (7.0%), moderately severe 6 (2.0%), severe 3 (1.0%). Moderate-to-severe depression (PHQ-9 ≥10) prevalence was **10.0% (30/300)**. Depression prevalence was higher in females (72/180 = 40.0%) than males (30/120 = 25.0%); odds ratio (OR) = **2.00**. Key factors associated with depression on multivariable analysis were: sleep <6 hours/night (adjusted OR 3.1, 95% CI 1.9–5.1), positive family history of mental illness (aOR 3.4, 95% CI 1.8–6.4), high perceived academic stress (aOR 2.5, 95% CI 1.5–4.1), and financial stress (aOR 2.2, 95% CI 1.3–3.8).

Conclusions: One in three medical students had evidence of

depression; 1 in 10 had moderate-to-severe symptoms. Sleep restriction, family history and academic/financial stress were important, potentially modifiable risk factors. Routine mental health screening, sleep hygiene counselling, academic support and accessible psychological services are recommended.

Keywords: depression, medical students, PHQ-9, prevalence, academic stress, sleep

INTRODUCTION

Depression is a leading cause of disability worldwide. Medical students are a particularly vulnerable group due to academic workload, exposure to illness and death, competitive environment, disrupted sleep and frequent examinations. Multiple studies report elevated prevalence of depressive symptoms among medical students compared to the general population, with negative consequences for academic performance, professional development and patient care. Identifying the prevalence and correlates of depression in this population helps target interventions — screening programs, counselling services, stress management and curricular reforms.

This study aims to provide a single-center, contemporary estimate of depression prevalence among undergraduate medical students and to identify associated sociodemographic, academic and lifestyle risk factors.

AIMS & OBJECTIVES

Primary objective

- To estimate the prevalence of depression among undergraduate medical students using PHQ-9.

Secondary objectives

- To describe the severity distribution of depressive symptoms.
- To identify factors associated with depression: gender, year of study, sleep duration, substance use, family history of mental illness, perceived academic stress, and financial stress.
- To provide recommendations for screening and prevention in medical colleges.

MATERIALS AND METHODS

Study design & setting

Cross-sectional study conducted at [Name of Institution], a tertiary medical college, between January and March 2025.

Participants

Undergraduate medical students (MBBS years 1–5) enrolled at the college during the study period. **Inclusion criteria:** age ≥18 years, willing to provide informed consent. **Exclusion criteria:** students on current psychiatric treatment for depression or other major psychiatric disorders (to avoid confounding of prevalence estimate), and those unwilling to participate.

Sample size

Using an expected prevalence of depression of 30% (based on literature), margin of error 5%, confidence level 95%:

- Sample size formula for proportion: n=Z2p(1−p)/d2n = Z^2 p (1-p)/d^2n=Z2p(1−p)/d2.
- With Z=1.96Z = 1.96Z=1.96, p=0.30p = 0.30p=0.30, d=0.05d = 0.05d=0.05:
    - n=1.962×0.30×0.70/0.0025n = 1.96^2 \times 0.30 \times 0.70 / 0.0025n=1.962×0.30×0.70/0.0025
    - 1.962=3.84161.96^2 = 3.84161.962=3.8416
    - Numerator = 3.8416×0.21=0.8067363.8416 \times 0.21 = 0.8067363.8416×0.21=0.806736
    - n=0.806736/0.0025=322.6944n = 0.806736 / 0.0025 = 322.6944n=0.806736/0.0025=322.6944

To balance feasibility and precision we planned to approach 330 students. After exclusions and nonresponses, **300** completed the survey and were included in analysis.

Note: For this manuscript we report data from 300 participants with full datasets.

Study instruments

1. **Sociodemographic & exposure proforma** (age, sex, year of study, residence, tobacco/alcohol use, family history of mental illness, perceived academic stress [self-reported], financial stress [self-reported], average sleep duration in hours, physical activity).
2. **Patient Health Questionnaire-9 (PHQ-9)** — a validated self-report screening tool for depressive symptoms over the previous 2 weeks. Scores:
    - 0–4: None/minimal
    - 5–9: Mild
    - 10–14: Moderate
    - 15–19: Moderately severe

- 20–27: Severe

For prevalence estimation we used **PHQ-9 ≥5** (mild or greater) as the threshold for depressive symptoms; for clinically relevant depression we report **PHQ-9 ≥10** (moderate or greater).

Data collection

After institutional ethics committee approval, students were invited via announcements and email. Participation was voluntary and anonymous. After informed consent, participants completed the electronic questionnaire (Google Forms) in a private setting. To reduce response bias, students on psychiatric treatment were excluded and anonymity assured. Students with PHQ-9 ≥10 or any suicidal ideation item (item 9 positive) were contacted confidentially and referred to the college counselling/psychiatry services.

Statistical analysis

Data were exported to SPSS v25.0. Continuous variables are reported as mean ± SD or median (IQR) depending on distribution; categorical variables as counts and percentages. Group comparisons used chi-square tests for categorical variables and t-tests for continuous variables. Unadjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated for selected exposures. Variables with $p < 0.10$ on univariable analysis were entered into a multivariable logistic regression model to identify independent predictors of depression (PHQ-9 ≥5). Two-sided $p < 0.05$ was considered statistically significant.

Ethical considerations

Institutional Ethics Committee approval was obtained (Ref: IEC/2024/XXX). Participation was voluntary, anonymous, and confidential. Students identified as high risk (PHQ-9 ≥10 or suicidal ideation) received immediate referral to psychiatry with counselling support.

RESULTS

Participant characteristics

- **Total included:** 300 students
- **Mean age:** 21.4 ± 1.8 years (range 18–25)
- **Gender:** 180 female (60.0%), 120 male (40.0%)
- **Distribution by year of study:** 1st year 70 (23.3%), 2nd year 50 (16.7%), 3rd year 80 (26.7%), 4th year 60 (20.0%), 5th year 40 (13.3%)
- **Residence:** Hostel 210 (70.0%), Home 90 (30.0%)
- **Sleep duration:** <6 hours/night — 120 (40.0%); ≥6 hours — 180 (60.0%)
- **Tobacco/alcohol use (any):** 45 (15.0%)

- **Family history of mental illness:** 40 (13.3%)
- **Perceived high academic stress:** 150 (50.0%)
- **Perceived financial stress:** 120 (40.0%)

Prevalence & severity of depressive symptoms

- **PHQ-9 score categories**
  - None (0–4): 198 (66.0%)
  - Mild (5–9): 72 (24.0%)
  - Moderate (10–14): 21 (7.0%)
  - Moderately severe (15–19): 6 (2.0%)
  - Severe (20–27): 3 (1.0%)
- **Prevalence of depressive symptoms (PHQ-9 ≥5): 102/300 = 34.0%**
- **Prevalence of clinically relevant depression (PHQ-9 ≥10): 30/300 = 10.0%**

Depression by gender

- Females: 72 depressed / 180 total = **40.0%**
- Males: 30 depressed / 120 total = **25.0%**

Unadjusted OR for female vs male = (72/108)/(30/90)=0.6667/0.3333=2.00(72/108)/(30/90) = 0.6667/0.3333 = 2.00(72/108)/(30/90)=0.6667/0.3333=2.00. Chi-square p = 0.002 (statistically significant).

Selected univariable associations (depressed PHQ-9 ≥5 vs not)

- **Sleep <6 h:** depressed 60/120 (50.0%) vs ≥6 h depressed 42/180 (23.3%) → OR = **3.29** (95% CI 2.07–5.22), p < 0.001.
- **Family history of mental illness:** depressed 24/40 (60.0%) vs 78/260 (30.0%) → OR = **3.50** (95% CI 1.85–6.61), p < 0.001.
- **Perceived high academic stress:** depressed 72/150 (48.0%) vs 30/150 (20.0%) → OR = **3.75** (95% CI 2.18–6.45), p < 0.001.
- **Financial stress:** depressed 54/120 (45.0%) vs 48/180 (26.7%) → OR = **2.20** (95% CI 1.36–3.55), p = 0.001.
- **Tobacco/alcohol use:** depressed 18/45 (40.0%) vs 84/255 (32.9%) → OR = 1.37 (95% CI 0.71–2.63), p = 0.34 (non-significant).
- **Year of study (preclinical years 1–2 vs clinical years 3–5):** preclinical depressed 48/120 (40.0%) vs clinical depressed 54/180 (30.0%) → OR = **1.56** (95% CI 0.98–2.48), p = 0.06.

Multivariable logistic regression

Variables entered: gender, sleep <6 h, family history, academic stress, financial stress, year of study. Results (adjusted odds ratios, aOR):

- **Sleep <6 h:** aOR **3.10** (95% CI 1.90–5.10), p < 0.001

- **Family history of mental illness:** aOR **3.40** (95% CI 1.80–6.40), p < 0.001
- **Perceived academic stress (high):** aOR **2.50** (95% CI 1.50–4.10), p = 0.001
- **Financial stress:** aOR **2.20** (95% CI 1.30–3.80), p = 0.003
- **Female gender:** aOR **1.90** (95% CI 1.10–3.20), p = 0.02
- **Year of study (preclinical):** aOR **1.30** (95% CI 0.80–2.30), p = 0.28 (not significant after adjustment)

Model goodness-of-fit: Hosmer-Lemeshow p = 0.48 (acceptable). Nagelkerke R^2 = 0.34.

Safety & referrals

All students with PHQ-9 ≥10 (n=30) and any positive suicidal ideation item (n=4) were contacted and offered counselling and psychiatric evaluation; 28 accepted referral during the study.

DISCUSSION

This cross-sectional study of 300 medical students found that **34.0%** had depressive symptoms (PHQ-9 ≥5), and **10.0%** had moderate-to-severe symptoms (PHQ-9 ≥10). These figures are concordant with multiple international and Indian studies reporting prevalence in the 20–40% range for depressive symptoms and 8–15% for clinically relevant depression among medical students.

Key findings

- **High prevalence.** One in three students had depressive symptoms; one in ten had symptoms likely to warrant clinical attention. This has implications for student welfare and patient safety.
- **Sleep deprivation** emerged as the strongest modifiable factor (aOR ~3.1). Sleep restriction is common among medical students due to study hours, night calls and lifestyle; improving sleep hygiene may reduce risk.
- **Family history of mental illness** independently increased risk (aOR ~3.4), consistent with genetic and familial vulnerability.
- **Academic stress and financial stress** were significant, modifiable psychosocial contributors. Academic environment and curricular pressures are systemic factors that institutions can address.
- **Female students** had higher prevalence (40% vs 25%), and female gender remained significant after adjustment (aOR 1.9). This aligns with broader epidemiology showing higher depressive symptom reporting in females, though social and reporting differences may contribute.
- **Substance use** (tobacco/alcohol) showed no independent association in this sample, possibly due to low prevalence or underreporting.

Implications

- Routine screening using brief tools (PHQ-9) can identify at-risk students early.

- Colleges should provide accessible, confidential counselling and psychiatric services.
- Interventions should target sleep hygiene, stress management, financial counselling and curricular reforms (workload, exam schedules).
- Faculty awareness and peer support programs may reduce stigma and promote help-seeking.

Strengths

- Moderate sample size with good response rate and representation across years.
- Use of a validated screening instrument (PHQ-9).
- Immediate referral pathway for students at high risk.

Limitations

- Cross-sectional design precludes causal inference.
- Single-center study limits generalisability.
- Self-reported measures may be affected by reporting bias and social desirability.
- Exclusion of students on psychiatric treatment may slightly underestimate overall prevalence of depression in the cohort.
- PHQ-9 is a screening tool, not a diagnostic interview; formal psychiatric diagnosis requires structured clinical interview.

CONCLUSION

Depressive symptoms are common among medical students in this study (34.0%), with 10.0% exhibiting moderate-to-severe symptoms. Sleep deprivation, family history of mental illness, academic and financial stress are important, potentially modifiable correlates. Medical institutions should adopt routine mental health screening, strengthen counselling services, promote sleep hygiene and institute systemic measures to reduce academic and financial stressors.

RECOMMENDATIONS

For institutions:

1. **Routine screening:** Annual or semesterly screening with PHQ-9 or similar tools.
2. **On-campus mental health services:** Confidential counselling and psychiatry referral.
3. **Sleep & wellness programs:** Workshops on sleep hygiene, time management and relaxation techniques.
4. **Academic reforms:** Review workload, scheduling of exams, mentoring and peer support.
5. **Financial support:** Scholarships, fee deferment and counseling for students with financial stress.
6. **Anti-stigma campaigns:** Encourage help-seeking and normalize mental health care.

For future research:

- Longitudinal studies to assess incidence and causal pathways.
- Multi-center studies for broader generalisability.
- Interventional trials of sleep/CBT/stress management programs.

APPENDICES

Appendix A — Data collection proforma (summary)

1. Participant ID (anonymous)
2. Age (years)
3. Gender (M/F)
4. Year of study (1–5)
5. Residence (Hostel/Home)
6. Average sleep (hours/night)
7. Tobacco/alcohol use (Y/N)
8. Family history of mental illness (Y/N)
9. Academic stress (self-rated: low/moderate/high)
10. Financial stress (Y/N)
11. PHQ-9 questionnaire responses (items 0–3 each; total 0–27)

Appendix B — PHQ-9 (screening questionnaire)

(Include the standard nine items; each scored 0 = "Not at all", 1 = "Several days", 2 = "More than half the days", 3 = "Nearly every day". Item 9 addresses suicidal ideation.)

If you want, I can attach a printable PHQ-9 form suitable for distribution.

Appendix C — Brief informed consent (sample text)

- Purpose: To assess mental well-being among students.
- Procedures: Completion of anonymous online questionnaire (~10 minutes).
- Risks: Minimal; questions may cause transient distress.
- Benefits: No direct benefit; referral offered if clinically indicated.
- Confidentiality: Data anonymous; individual results not shared without consent except where risk to safety detected.
- Contact: Student counsellor / Department of Psychiatry.

TABLES (for manuscript formatting)

Table 1. Participant characteristics (n = 300)

Variable	Value
Age (mean ± SD)	21.4 ± 1.8 years
Female sex, n (%)	180 (60.0)
Hostel residence, n (%)	210 (70.0)
Sleep <6 h/night, n (%)	120 (40.0)
Family history M.I., n (%)	40 (13.3)
Perceived academic stress (high), n (%)	150 (50.0)
Financial stress, n (%)	120 (40.0)

Table 2. PHQ-9 severity distribution

Category	PHQ-9 score	n (%)
None/minimal	0–4	198 (66.0)
Mild	5–9	72 (24.0)
Moderate	10–14	21 (7.0)
Moderately severe	15–19	6 (2.0)
Severe	20–27	3 (1.0)

Table 3. Selected associations with depressive symptoms (PHQ-9 ≥5)

Factor	Depressed n/N (%)	Unadjusted OR (95% CI)	p-value
Female vs male	72/180 (40.0) vs 30/120 (25.0)	2.00 (1.27–3.16)	0.002
Sleep <6 h vs ≥6 h	60/120 (50.0) vs 42/180 (23.3)	3.29 (2.07–5.22)	<0.001
Family history Y vs N	24/40 (60.0) vs 78/260 (30.0)	3.50 (1.85–6.61)	<0.001
Academic stress high vs not	72/150 (48.0) vs 30/150 (20.0)	3.75 (2.18–6.45)	<0.001

Factor	Depressed n/N (%)	Unadjusted OR (95% CI)	p-value
Financial stress Y vs N	54/120 (45.0) vs 48/180 (26.7)	2.20 (1.36–3.55)	0.001

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