



Insomnia in Rural Mahila Female University in Haryana: A Cross-Sectional Study on Family Dynamics and Lifestyle Habits as Influencing Factors among Undergraduate Students

Ilakkiya P^{ID},^{1*} Ramesh Verma^{ID},¹ Anita Punia^{ID},¹ Sineesh T V^{ID}²

¹Department of Community Medicine, Bhagat Phool Singh Government Medical College for Women, Sonipat, Haryana, India.

²Department of Community Medicine, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India.

ABSTRACT

Background

Insomnia significantly impacts the well-being of young adults. Undergraduate students, particularly females, are a high-risk demographic due to academic pressure, lifestyle changes, and social transitions. This study aimed to determine the prevalence and role of family dynamics and lifestyle habits in insomnia among female undergraduate students in a rural area of Haryana.

Methods

A college-based cross-sectional study was conducted from June to December 2025 involving 340 randomly selected female students (170 medical, 170 non-medical). Data were collected via in-person interviews using a socio-demographic questionnaire and the validated Insomnia Severity Index (ISI). Statistical analysis was performed using SPSS version 26, employing Chi-square and Fisher's exact tests (significance at $p < 0.05$).

Results

The prevalence of clinically significant insomnia was 6.5% and 4.7% for non-medical and medical students, respectively. Significant correlations were found between insomnia and living in joint families ($p=0.018$) or in households with more than 8 members ($p=0.036$). Participants who communicated most frequently with their fathers had a higher rate of insomnia ($p=0.032$). Significant lifestyle correlates included smoking ($p=0.026$), spending over two hours on screens before sleep ($p=0.029$), and recent illness ($p=0.012$).

Conclusions

Insomnia in this population is driven by domestic structures, lifestyle choices, and digital habits. While academic discipline was not a significant factor, strong links to smoking and pre-sleep screen time highlight an urgent need for targeted university-led behavioral interventions.

Keywords: Insomnia; Female Students; Haryana; Family dynamics; Lifestyle habits.

***Correspondence:** Dr. Ilakkiya P, Department of Community Medicine, Bhagat Phool Singh Government Medical College for Women, Sonipat, Haryana, India. Email: ilakkiyaps562@gmail.com. **Article received:** 2026-02-15. **Article accepted:** 2026-06-12. **Article published:** 2026-09-30.

INTRODUCTION

Insomnia is one of the major sleep disorders according to the International Classification of Sleep Disorders (ICDS-3-TR). Complaints of insomnia typically involve difficulty falling asleep, staying asleep, or both. These issues may include extended night-time wake-ups or insufficient nocturnal sleep, occurring three to four times a week for over a month.¹ Healthy sleep is essential for both physical and mental well-being, and it can also enhance productivity and overall quality of life.² The incidence of sleep deprivation is very high, at 31.66% in the 16-30 age group, in India, which indicates chronic sleep deprivation among Indian youth, possibly due to a changing lifestyle.³ This crisis is especially acute, with 49% of people struggling to fall asleep. The gender gap is clear: 17% of Indian women take sick leave due to poor sleep, compared to 12% of men.⁴ There are limited studies conducted, particularly in Haryana, and it is important to find the problems that the students face during their college years. This study aims to find the prevalence of insomnia among medical and non-medical students and the role of family structure and lifestyle habits among participants with insomnia.

METHODS

Study Area

The study was conducted in the medical college of BPS GMC for Women and BPS Mahila Vishwavidyalaya University, Sonipat.

Study Design

College-based comparative cross-sectional study was conducted.

Sample Size and Sampling

The study population consisted of undergraduate female students. Students residing in the college campus hostel for more than six months who provided written informed consent were included in the study. Students under 18 years of age were excluded to maintain a homogeneous adult cohort and simplify ethical consent. The participants were divided into medical and non-medical groups to compare the impact of high-intensity academic learning rhythms

(medical) against diverse professional vocational streams (non-medical) on sleep quality.

The sample size (340) was calculated using the following formula: $n = Z^2 \times p(1-p)/d^2$, based on a 33% prevalence of insomnia among college students, as per Shah.⁵ Using a Z value of 1.96 and a 95% confidence interval, 5% precision calculations were performed to ensure a representative sample for the study. A stratified random sampling method was used to ensure equal representation. The student population was first stratified into two strata: Medical (Bachelor of Medicine, Bachelor of Surgery (MBBS) and Bachelor of Ayurvedic Medicine and Surgery (BAMS)) and Non-medical (Hotel Management, Commerce, Fashion Technology, Engineering, and Law). Within each stratum, 170 students were selected using a simple random sampling technique via a computer-generated random number table based on the student enrolment registers provided by the respective departments.

Data Collection

Study was conducted from June 2025 to December 2025. Data collection was performed through in-person interviews using a pretested, semi-structured questionnaire covering aspects of socio-demographic characteristics, family particulars, lifestyle habits and one validated sleep scale (Insomnia Severity Index scale (ISI)) to evaluate the severity of insomnia.⁶ The ISI uses 7 items; each item is graded on a 0 to 4 Likert scale, and the total score is calculated as the sum of each item, yielding minimum and maximum values of 0 and 28, respectively. It is classified into four diagnostic categories: no clinically significant insomnia (0-7), subthreshold insomnia (8-14), moderate clinical insomnia (15-21), and severe clinical insomnia (22-28). The ISI scale exhibited high internal consistency, as indicated by a Cronbach's alpha of 0.828. In this study, ISI scores were divided into 2 categories based on a cutoff point of 15: patients with clinically significant insomnia (cutoff point of 15 or more) and participants with no clinically significant insomnia (cutoff point less than 15).

Data Analysis

The quantitative data were checked for completeness and consistency of the information obtained from the respondent and entered into an Excel sheet. Descriptive analysis (like frequencies, tables, percentages, means, and standard deviation) was done to describe variables. The collected data were analyzed using SPSS software version 26. The Chi-square test was used for group comparisons for categorical data. In case the expected frequency in the contingency tables was found to be <5 in any of the cells, Fisher's exact test was used instead. Statistical significance was kept at $p < 0.05$.

RESULTS

A total of 340 female undergraduate students participated in the study. The mean age of the cohort was 20.44 ± 1.79 years. The majority of participants ($n=241/340$; 70.9%) were aged 18 to 21 years and were residents of Haryana ($n=284/340$; 83.5%). The cohort was predominantly Hindu ($n=326/340$; 95.8%) and from the General social category ($n=188/340$; 55.3%). Regarding academic distribution, the medical group ($n=170/340$; 50%) included students from Bachelor of Medicine, Bachelor of Surgery (MBBS) and Bachelor of Ayurvedic Medicine and Surgery (BAMS). The non-medical group ($n=170/340$; 50%) comprised students from Hotel Management, Commerce, Fashion Technology, Engineering, and Law. Statistically significant associations were observed between domestic structures and sleep health. Students living in joint family systems reported a higher prevalence of insomnia (9.4%; $n=12/128$) compared to those in nuclear families (3.3%; $n=7/212$, $p=0.018$). Similarly, households with more than eight members showed a higher insomnia rate (12.3%; $n=7/57$) than smaller households (4.2%; $n=12/283$) ($p=0.036$) (Table 1).

Table 1: Association of family particulars of study participants with insomnia ($n=340$).

Variables	Insomnia	No	p-value
	(n=19)	insomnia (n=321)	
Number of family members			

3-8	12 (4.2)	271 (95.8)	0.036 ^a
>9 members	7 (12.3)	50 (87.7)	
Type of family			
Nuclear	7 (3.3)	205 (96.7)	0.018 ^a
Joint	12 (9.4)	116 (90.6)	
Number of Siblings			
≤3 Siblings	17 (5.3)	303 (94.7)	0.309 ^b
>3 Siblings	2 (10.0)	18 (90.0)	
Birth order			
1 to 2	16 (5.3)	285 (94.7)	0.375 ^b
3 to 5	3 (7.7)	36 (92.3)	
Family history of mental illness			
Yes	2 (10.5)	17 (89.5)	0.287 ^b
No	17 (5.3)	304 (94.7)	
Any stressful event has happened in the family over the last year			
Yes	3 (13.0)	20 (87.0)	0.128 ^b
No	16 (5.0)	301 (95.0)	

a=Chi-square test, b=Fischer's exact test

Analysis of communication patterns revealed that participants who identified their father as their primary communication partner (that is, with whom participants talked more often in the family) had a significantly higher prevalence of insomnia (17.2%; $n=5/29$) compared to those who talked more with their mothers (4.7%; $n=9/193$). Additionally, the presence of a current physical illness was significantly associated with sleep disruption (9.8%; $n=12/123$; $p=0.012$). Similarly, individuals with a good relationship with friends had a lower prevalence of insomnia (4.1%; $n=11/267$) than those with a bad relationship (11.0%; $n=8/13$) ($p=0.024$) (Table 2).

Table 2: Association of perceived personal history of study participants with insomnia ($n=340$).

Variables	Insomnia	No	p-value
	(n=19)	insomnia (n=321)	
Relationship with family			
Good	16 (5.0)	305 (95.0)	0.081 ^b
Bad	3 (15.8)	16 (84.2)	
Frequency of talking with the family			
Regularly	16 (5.3)	288 (94.7)	0.713 ^b
Occasionally	3 (8.3)	33 (91.7)	
With whom do you talk more often			

Mother	9 (4.7)	184 (95.3)	0.032 ^a
Father	5 (17.2)	24 (82.8)	
Both	3 (3.3)	87 (96.7)	
Sibling	2 (7.1)	26 (92.9)	
Relationship with friends			
Good	11 (4.1)	256 (95.9)	0.024 ^a
Bad	8 (11.0)	65 (89.0)	
Relationship status			
Single	15 (5.0)	284 (95.0)	0.338 ^a
Boy friend /	3 (8.6)	32 (91.4)	
Girlfriend			
Broke up	1 (16.7)	5 (83.3)	
Presence of illness			
Illness Present	12 (9.8)	111 (90.2)	0.012 ^a
No Illness	7 (3.2)	210 (96.8)	

a=Chi-square test, b=Fischer's exact test

Lifestyle factors, particularly substance use and digital habits, showed significant correlations with insomnia. Smoking was strongly associated with insomnia; 40% of smokers (n=2/5) reported clinically significant symptoms (p=0.026). Pre-sleep screen usage demonstrated a dose-response relationship with insomnia (p=0.029). The highest prevalence (9.4%; n=13/138) was found among those using devices for more than two hours before sleep, while the lowest (1.4%; n=1/74) was among those with less than one hour of screen time (Table 3).

Table 3: Association of lifestyle habits of study participants with insomnia (n=340).

Variables	Insomnia (n=19)	No insomnia (n=321)	p-value
Do you take Coffee/Tea			
Yes	11 (6.8)	150 (93.2)	0.344 ^a
No	8 (4.5)	171 (95.5)	
Do you smoke			
Yes	2 (40.0)	3 (60.0)	0.026 ^b
No	17 (5.1)	318 (94.9)	
Do you drink			
Yes	2 (15.4)	11 (84.6)	0.159 ^b
No	17 (5.2)	310 (94.8)	
Physical activity			
Regular	4 (4.9)	77 (95.1)	1.000 ^b
Irregular	15 (5.8)	244 (94.2)	
Hours of Screening time before sleep			
<1 hour	1 (1.4)	73 (98.6)	0.029 ^a
1-2 hours	5 (3.9)	123 (96.1)	
>2 hours	13 (9.4)	125 (90.6)	

Hours of study time daily

<1 hour	5 (15.6)	27 (84.4)	0.081 ^a
1-2 hours	8 (7.1)	105 (92.9)	
>2 hours	10 (2.1)	189 (97.9)	

Mode of study

Book	4 (6.2)	61 (93.8)	0.506 ^a
Gadgets	4 (9.1)	40 (90.9)	
Both	11 (4.8)	220 (95.2)	

a=Chi-square test, b=Fischer's exact test

Using the Insomnia Severity Index (ISI) with a cut-off score of 15, the overall prevalence of clinically significant insomnia in the study population was 5.6% (n=19/340). When stratified by academic stream, the prevalence was 4.7% (n=8/170) among medical students and 6.5% (n=11/170) among non-medical students (Table 4).

Table 4: Comparison of insomnia prevalence between medical and non-medical students (n=340).

Stream	Prevalence of insomnia (%)
Medical	4.7
Non-medical	6.5

DISCUSSION

The burden of insomnia among undergraduate students has been slowly increasing, and it is one of the major health concerns. The transition to university life presents a unique set of challenges for undergraduate students, often leading to changes in lifestyle and their daily routines. So, in this present study, we assessed the prevalence and role of family dynamics and lifestyle habits in insomnia among 340 undergraduate female students.

The prevalence of clinically significant insomnia in this cohort (5.6%) is notably lower than Indian estimates, such as the 33% reported by *Shah et al.*, and 71.3% in Chennai.^{5, 6} This discrepancy may be attributed to the unique residential setting of the study. Participants were entirely hostel-bound students within a rural university. Unlike urban day-scholars who face long commutes and varied domestic stressors, these students live in a structured environment with 75.3% residing in single-occupancy rooms. This relative isolation from diverse environmental stressors may act as a protective factor, though it limits the generalizability

of our findings to broader student populations. The present study reveals that domestic structure and family dynamics play a pivotal role in the prevalence of insomnia among participants. We observed a higher prevalence of insomnia among those from households with more than 9 members and those living in joint family systems, a finding that was statistically significant and aligns with observations by *Roy SK et al.*, in West Bengal.⁷ The psychological strain of transitioning away from large, supportive family units may trigger loneliness or stress, both established precursors to sleep disturbances in student populations. Furthermore, familial medical history appears to be a factor; 10.5% of those with a family history of sleep disorders reported insomnia. While our data did not mirror previous findings associating insomnia specifically with a family history of psychiatric illness, we did find a notable prevalence (13%) among participants who had recently lost a family member, which establishes a clinical link between acute grief and sleep disruption. Interestingly, whereas *Demirer İ et al.*, established a formal association with recent bereavement, our findings highlight the trend without reaching the same level of statistical correlation.⁸ Family relationships and communication patterns also significantly influenced sleep quality. Although the link between general family relationship quality and insomnia was not statistically significant in this cohort, the prevalence was markedly higher (15.8%) among those reporting poor family relations, echoing similar cross-sectional findings from Turkey.⁸ A unique correlation was found regarding communication: participants who primarily spoke with their fathers reported higher insomnia rates (17.2%). However, as this study is cross-sectional, we cannot establish a causal link or determine whether this reflects specific attachment qualities or serves as a proxy for other unmeasured domestic stressors. Further longitudinal research is required to explore these interpersonal dynamics. Regarding physical health and lifestyle, a current illness was significantly linked to insomnia, supporting research by *Manzar D et al.*, and *Suan B*

et al.,^{9,10} which identifies chronic medical conditions as major contributors to sleep disruption. Lifestyle choices, particularly stimulant use, showed mixed results. While coffee and tea consumption did not reach statistical significance, contrary to *Aljafen BN et al.*,’s findings, smoking was highly significant, with 40% of smokers experiencing insomnia.¹¹ This aligns with *Shah AF et al.*, and *Yilmaz Y et al.*,^{5, 12} suggesting that nicotine's impact on mood and cognitive function creates a detrimental cycle for sleep health. Notably, we found no significant link with alcohol consumption; however, this may be attributed to social desirability bias, where participants under-report alcohol uses due to its perceived social stigma.

Finally, the impact of modern technology on sleep hygiene was evident. Our study confirmed a statistically significant relationship between prolonged screen time before bed and insomnia. Specifically, individuals using mobile devices for more than two hours before sleep showed a 9.4% prevalence of insomnia, reinforcing the conclusions of *Shah AF et al.*, and *Hebber S et al.*, regarding the disruptive nature of pre-sleep electronic use.^{5, 13}

While our study identified a high prevalence of insomnia among participants in non-medical courses, no statistically significant association was found between the specific field of study (medical vs. non-medical) and sleep disturbances. This lack of disparity may be attributed to a higher level of sleep hygiene literacy among medical students, which potentially acts as a protective factor against academic stressors. This comparative gap is notable as existing literature focusing on medical versus non-medical field associations is sparse. However, our findings exist within a broad global context; a systematic review by *Baklola M et al.*, reported that student insomnia prevalence varies extensively from 19.3% to 98.7%, with a pooled prevalence of 43.3% globally and 38.6% specifically within medical cohorts.¹⁴ These figures align with the high variability seen in recent regional studies, such as the 71.3% prevalence among undergraduates in Chennai (*Rajinikanth SB et al.*, 2025) and 78.4% in

Saudi Arabia (*Almori RM et al.*, 2024), contrasted against lower rates like the 14% observed among South Indian medical students by *Cheriyian KR et al.*, (2024).^{6, 15, 16} This wide range suggests that while the academic field itself may not always be a primary driver, localized environmental and institutional factors significantly influence the sleep health of the university population.

Limitations

The findings from this study should be interpreted in light of several limitations. The study's cross-sectional design prevents the establishment of temporal sequences or causal links between domestic factors and insomnia. Furthermore, the findings are restricted to a specific population in Haryana and may not be generalizable to different regions or genders. The reliance on self-reported data introduces the risk of recall bias and social desirability bias, particularly regarding sensitive behaviours such as smoking and alcohol use, which may result in under-reporting. Finally, the relatively small number of clinically significant insomnia cases identified may limit the statistical power for complex subgroup analyses.

Conclusions

This study identifies a significant association between domestic structures, lifestyle habits, and insomnia among female undergraduate students in rural Haryana. The findings indicate that large joint family systems and specific communication patterns are correlated with higher rates of sleep disruption, though the cross-sectional nature of this study precludes a causal interpretation of these links. While no significant disparity was found between medical and non-medical academic streams, the data suggest that modern lifestyle factors, specifically

smoking and excessive pre-sleep screen time, are primary correlates of poor sleep health. To address these findings, university institutions should move beyond general awareness and implement targeted, behaviour-based interventions: digital wellness programming, targeted smoking cessation, peer support and family counselling, and curricular integration.

Ethics approval

Ethical clearance was obtained from Bhagat Phool Singh Government Medical College for Women, Institutional Ethic Committee (Ref. No.: BPSGMCW/RC1039/IEC/24).

Acknowledgement

The authors would like to thank all participants in the study and the entire department of Community Medicine, BPS GMCW, for their support in conducting this study.

Conflict of interest

The author declares no conflict of interest.

Funding

No funding was received from any agency for conducting this study.

Availability of data and materials

The datasets generated and analyzed during the study are available from the corresponding author.

Author contributions

Conceptualization: Ilakkiya P, Ramesh Verma, Anita Punia, Sineesh T V

Data curation: Ilakkiya P

Formal analysis: Ilakkiya P, Anita Punia

Investigation: Ilakkiya P

Methodology: Ilakkiya P, Ramesh Verma, Anita Punia, Sineesh T V

Supervision: Ilakkiya P, Ramesh Verma, Anita Punia, Sineesh T V

Writing-original draft: Ilakkiya P, Ramesh Verma

Writing-review & editing: Ilakkiya P, Ramesh Verma, Anita Punia, Sineesh T V

REFERENCES

1. American Academy of Sleep Medicine. International Classification of Sleep Disorders-3-Text Revision (ICSD-3-TR): Insomnia. Darien (IL): American Academy of Sleep Medicine; 2022 May. [\[Link\]](#)
2. Ramar K, Malhotra RK, Carden KA, Martin JL, Abbasi-Feinberg F, Aurora RN, et al.

- Sleep is essential to health: an American Academy of Sleep Medicine position statement. *Journal of Clinical Sleep Medicine*. 2021 Oct 1;17(10):2115-9. [DOI]
3. Ramrakhiyani VC, Deshmukh SV. Study of the incidence and impact of chronic sleep deprivation in Indian population with special emphasis on neuropsychology testing. *Indian Journal of Sleep Medicine*. 2018 Dec 1;14(2):23-8. [DOI]
 4. BioSpectrum India. Global sleep study 2025 reveals India's growing sleep crisis. Mumbai: BioSpectrum India; 2025 Feb 28. [Link]
 5. Shah AF, Patil RK, Gupta R. Assessment of the prevalence, risk factors of insomnia, and its effect on quality of life among young population of North region. *Int J Community Med Public Health*. 2022 Oct;9:3804. [DOI]
 6. Rajinikanth SB, Priya GV, Raj RD, Arulselvan D, Rekha UV. Prevalence and factors influencing insomnia among college students in a private university in Chennai. *Journal of Pioneering Medical Sciences*. 2025 Jan 5;13:131-4. [DOI]
 7. Roy SK, Bhattacharjee AK, Chakraborti C, Singh R. Prevalence of insomnia in urban population of West Bengal: A community based cross sectional study. *Int J Med Public Health*. 2015 Oct 1;5(4):293. [DOI]
 8. Demirer İ, Erol S. The relationships between university students' physical activity levels, insomnia and psychological well-being. *Journal of Psychiatric Nursing*. 2020;11(3):201-11. [DOI]
 9. Manzar DI. Insomnia and related complaints: association with chronic disease, mild-severe levels of anxiety and poor sleep hygiene in Ethiopian collegiate young adults. *Pakistan J Med Health Sci*. 2020;14:1769-74. [DOI]
 10. Suman B, Praerna B, Kashinath M, Hemant B. Insomnia in patients suffering from chronic medical illnesses: prevalence and impact of IAYT. *Open Journal of Endocrine and Metabolic Diseases*. 2017 Oct 30;7(10):191. [DOI]
 11. Aljafen BN, Alneseyan RA, Bahr MH, Abusrair FH, Almutawa AA, et al. Predictors of Insomnia and Sleep Abnormalities in Medical Students and Its Impact on Academic Performance. *Journal of Nature and Science of Medicine*. 2024 Jul 1;7(3):197-203. [DOI]
 12. Yilmaz Y, Kugu N. The prevalence of insomnia in university students and its relationship with quality of life: a university sample. [DOI]
 13. Hebbar Ms S, Jose Dr TT, Nayak Ms S. Prevalence and the contributing factors of insomnia among adolescents in selected secondary schools of Udupi district Karnataka. *Manipal Journal of Nursing and Health Sciences*. 2017;3(1):9. [Link]
 14. Baklola M, Terra M, Al-barqi M, AbdulHusain YH, Asiri SA, Jadaan NS, et al. Prevalence of insomnia among university students in Saudi Arabia: a systematic review and meta-analysis. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*. 2024 Nov 19;60(1):138. [DOI]
 15. Alomri RM, Alghamdi Y. The prevalence and predictors of sleep disorders and their impact on academic performance among Saudi university students: a cross-sectional study. *Cureus*. 2024 May 29;16(5). [DOI]
 16. Cheriyan KR, Gurrupu V, Manhari RP, Manjula S, Babu RS. Prevalence of sleep disorders among south Indian medical students. *IJPR*. 2024;6(1):07-10. [DOI]

Citation: P I, Verma R, Punia A. Insomnia in Rural Mahila Female University in Haryana: A Cross-Sectional Study on Family Dynamics and Lifestyle Habits as Influencing Factors among Undergraduate Students. *J Coll Med Sci-Nepal*. 2026 Sep. 30;22(3):320-6.