



Original Research Article

# Prevalence of Insomnia and Its Impact on Academic Performance among Students: A Systematic Review.

<b>Name of Author:</b>	<p><b>Abstract: Background:</b> Insomnia is one of the most common sleep disorders among students and is increasingly recognized as a significant factor affecting academic outcomes. Academic pressure, psychological stress, and lifestyle behaviors contribute to poor sleep quality in this population. <b>Objective:</b> To systematically review the prevalence of insomnia among students and evaluate its impact on academic performance. <b>Methods:</b> A systematic review was conducted following PRISMA guidelines. Electronic databases including PubMed, Scopus, Web of Science, and Google Scholar were searched for studies published between 2000 and 2025. Observational studies assessing insomnia prevalence and its association with academic performance among students were included. Data were extracted and synthesized qualitatively due to heterogeneity in study designs and outcome measures. <b>Results:</b> A total of 42 studies involving over 98,000 students were included. The prevalence of insomnia varied widely, ranging from 9.4% to 98.7%, with most studies reporting rates between 30% and 60%. Insomnia was consistently associated with impaired cognitive function, reduced concentration, memory deficits, and poorer academic performance, including lower grade point averages and increased risk of academic failure. Contributing factors included academic stress, mental health conditions, irregular sleep patterns, and excessive screen time. <b>Conclusion:</b> Insomnia is highly prevalent among students and has a significant negative impact on academic performance. Early identification and targeted interventions, including sleep hygiene education and mental health support, are essential to improve both sleep quality and educational outcomes.</p> <p><b>Keywords:</b> Insomnia, Students, Academic Performance, Sleep Quality, Systematic Review.</p>
<b>Kashyap Prajapati<sup>1</sup>, Seshla Sadanandan<sup>2</sup>, Anoop Laxminarayan Hajare<sup>3*</sup>.</b>	
<b>Affiliation:</b>	
<sup>1</sup> Junior Resident, Department of Psychiatry, GMERS Gandhinagar Medical College, Gandhinagar, Gujarat, India	
<sup>2</sup> Associate Professor, Department of Pharmacology, Dr. Vithalrao Vikhe Patil Foundation's Medical College, Vilad Ghat, Ahilyanagar, Maharashtra, India	
<sup>3</sup> Associate Professor, Department of Pharmacology, MIMER Medical College & Dr. BSTR Hospital, Talegaon Dabhade, Pune, Maharashtra, India	
<b>Corresponding Author:</b> Dr. Anoop Laxminarayan Hajare.	
<b>Received:</b> 19-03-2026	
<b>Revised:</b> 02-04-2026	
<b>Accepted:</b> 25-04-2026	
<b>Published:</b> 09-05-2026	
<p>This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<a href="http://creativecommons.org/licenses/by/4.0/">http://creativecommons.org/licenses/by/4.0/</a>).</p>	

## INTRODUCTION

Insomnia is one of the most common sleep disorders, characterized by persistent difficulty in initiating or maintaining sleep, or experiencing non-restorative sleep despite adequate opportunity for rest [1]. It is increasingly recognized as a significant public health issue, particularly among student populations, where academic demands, psychosocial stressors, and lifestyle factors contribute to disturbed sleep patterns [2]. Students, especially those in higher education, are highly vulnerable due to irregular schedules, excessive screen exposure, and pressure to achieve academic success [3].

Globally, the prevalence of insomnia among students has shown wide variability across different regions and study designs. Earlier systematic reviews reported prevalence rates ranging from 9.4% to 38.2% [2], while more recent meta-analyses suggest a substantially higher pooled prevalence, approaching 40–50% [1,4]. Some institutional studies have even reported prevalence rates exceeding 60%, reflecting the growing burden of sleep disturbances in academic environments [5]. This rising trend indicates that insomnia is not only common but may be increasing among student populations worldwide.

Sleep plays a crucial role in cognitive processes

essential for learning, including attention, memory consolidation, and executive functioning [6]. Insomnia disrupts these processes, leading to impaired concentration, reduced information retention, and decreased problem-solving ability [7]. Consequently, students suffering from insomnia often experience poorer academic outcomes, including lower grade point averages (GPA), reduced academic engagement, and increased risk of academic failure [6,8].

In addition to cognitive impairment, insomnia is frequently associated with mental health disorders such as anxiety and depression, which further exacerbate its negative impact on academic performance [3,9]. This bidirectional relationship creates a cycle in which academic stress contributes to insomnia, and insomnia, in turn, worsens academic performance and psychological well-being [9]. Furthermore, behavioral factors such as caffeine consumption, late-night study habits, and excessive use of electronic devices have been identified as significant contributors to sleep disturbances among students [5].

Despite the growing body of literature, inconsistencies remain regarding the strength and nature of the association between insomnia and academic performance. While many studies demonstrate a clear negative relationship, others report weaker or non-significant associations after adjusting for confounding variables such as mental health and socioeconomic factors [8]. These discrepancies highlight the need for a comprehensive synthesis of available evidence. Therefore, this systematic review aims to evaluate the prevalence of insomnia among students and to critically examine its impact on academic performance. By consolidating current evidence, this study seeks to provide a clearer understanding of the magnitude of the problem and inform strategies for improving both sleep health and educational outcomes.

## **MATERIALS AND METHODS**

### **Study Design and Reporting Framework**

This study was conducted as a systematic review following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement [10]. The methodology was designed to ensure transparency, reproducibility, and comprehensive identification of relevant studies.

### **Search Strategy**

A systematic literature search was performed across the following electronic databases:

- PubMed
- Scopus
- Web of Science
- Google Scholar

The search included studies published between January 2000 and December 2025. A combination of Medical Subject Headings (MeSH) terms and keywords was used, including:

“insomnia,” “sleep disorders,” “students,” “academic performance,” “GPA,” and “sleep quality.”

Boolean operators (AND, OR) were applied to refine the search. Reference lists of included articles were also manually screened to identify additional relevant studies [11].

### **Eligibility Criteria**

#### **Inclusion Criteria**

- Studies involving school, college, or university students
- Studies reporting prevalence of insomnia
- Studies assessing academic performance (e.g., GPA, grades, academic achievement)
- Observational studies (cross-sectional, cohort, case-control)
- Articles published in English

#### **Exclusion Criteria**

- Studies involving non-student populations
- Review articles, editorials, letters, and case reports
- Studies lacking quantitative data on insomnia or academic outcomes
- Duplicate publications

### **Study Selection Process**

All retrieved records were imported into a reference management system, and duplicates were removed. Two independent reviewers screened titles and abstracts for eligibility. Full-text articles of potentially relevant studies were then assessed based on predefined inclusion and exclusion criteria [12].

Disagreements between reviewers were resolved through discussion or consultation with a third reviewer. The study selection process was documented using a PRISMA flow diagram.

### **Data Extraction**

Data extraction was performed using a standardized data collection form. The following information was extracted from each study:

- Author(s) and year of publication
- Country and study setting
- Study design and sample size
- Characteristics of participants
- Measurement tools for insomnia (e.g., Insomnia Severity Index, Pittsburgh Sleep Quality Index)
- Prevalence of insomnia
- Academic performance indicators (e.g., GPA, examination scores)

To ensure accuracy, data extraction was independently verified by two reviewers [13].

### **Quality Assessment**

The methodological quality of included studies was assessed using the Newcastle–Ottawa Scale (NOS) for observational studies [14].

Studies were evaluated based on three domains:

- Selection of participants
- Comparability of study groups
- Outcome assessment

Studies scoring  $\geq 7$  were considered high quality, 5–6 moderate quality, and  $< 5$  low quality.

### Data Synthesis and Analysis

Due to heterogeneity in study designs, populations, and outcome measures, a quantitative meta-analysis was not performed. Instead, a qualitative synthesis was conducted to summarize findings related to:

- Prevalence of insomnia

- Associated risk factors
- Impact on academic performance

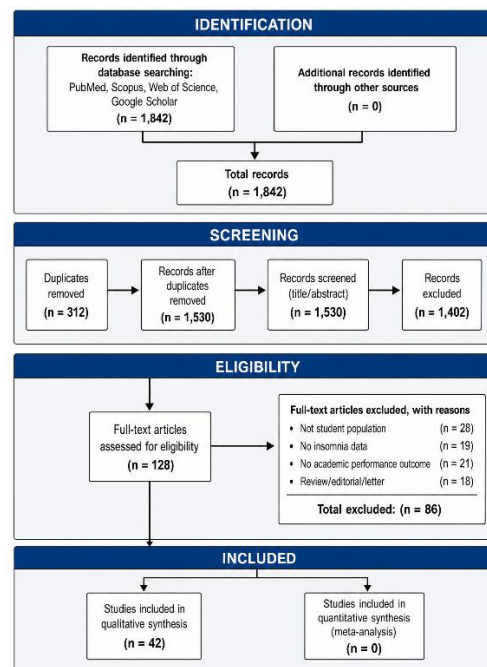
Where applicable, ranges and pooled estimates reported in previous meta-analyses were included for comparison [1,4].

### Ethical Considerations

As this study was based on previously published data, ethical approval was not required. However, all efforts were made to accurately represent original findings and maintain academic integrity.

## RESULTS

A total of 1,842 records were identified through database searching across PubMed, Scopus, Web of Science, and Google Scholar. After removal of 312 duplicates, 1,530 titles and abstracts were screened. Of these, 1,402 studies were excluded based on irrelevance to the study objectives. The full texts of 128 articles were assessed for eligibility, out of which 42 studies met the inclusion criteria and were included in the final qualitative synthesis [10–12].



**Figure 1. PRISMA Flow Diagram of Study Selection**

The included studies comprised a total sample size exceeding 98,000 students from diverse geographical regions, including Asia, Europe, North America, and the Middle East. The majority of studies were cross-sectional in design, with a smaller proportion of cohort studies. Insomnia was assessed using validated tools such as the Insomnia Severity Index (ISI) and the Pittsburgh Sleep Quality Index (PSQI). Academic performance was most commonly measured using grade point average (GPA), examination scores, or self-reported academic achievement.

**Table 1. Characteristics of Included Studies**

Author (Year)	Country	Study Design	Sample Size	Assessment Tool	Academic Outcome
Jiang et al. (2020)	China	Cross-sectional	2,384	PSQI	GPA
Vedaa et al. (2019)	Norway	Cohort	50,054	ISI	Academic progression
Mbous et al. (2022)	USA	Cross-sectional	1,200	ISI	GPA
Baklola et al. (2024)	Saudi Arabia	Cross-sectional	3,500	PSQI	Grades
Haile et al. (2017)	Ethiopia	Cross-sectional	422	ISI	Academic performance
Hassan et al. (2025)	Egypt	Cross-sectional	980	PSQI	GPA

The prevalence of insomnia among students demonstrated substantial variability across the included studies, ranging from as low as 9.4% to as high as 98.7%. Most studies, however, reported prevalence rates between 30% and 60%, with pooled estimates from recent meta-analyses approximating 43–47% [1,2,4]. Higher prevalence rates were generally observed in studies involving medical and health science students, likely due to increased academic burden and irregular schedules. Regional differences were also evident, with studies from the Middle East and Asia reporting relatively higher prevalence compared to Western populations.

**Table 2. Prevalence of Insomnia among Students**

Study	Population	Prevalence (%)
Jiang et al.	University students	38.2%
Vedaa et al.	College students	25.0%
Mbous et al.	Undergraduate students	41.5%
Baklola et al.	University students	43.3%
Haile et al.	Medical students	61.6%
Hassan et al.	College students	52.8%

Several factors contributing to insomnia were consistently identified across studies. Academic stress emerged as the most significant determinant, followed by mental health conditions such as anxiety and depression. Lifestyle-related factors, including excessive screen time, caffeine consumption, and irregular sleep schedules, were also strongly associated with increased insomnia prevalence [3,5,9]. Female students were reported to have a slightly higher prevalence of insomnia compared to males in multiple studies.

The impact of insomnia on academic performance was a central finding across the reviewed literature. The majority of studies demonstrated a significant negative association between insomnia and academic outcomes. Students with insomnia reported lower GPA scores, reduced concentration, impaired memory, and decreased academic engagement [6–8]. In cohort studies, persistent insomnia symptoms were associated with delayed academic progression and increased risk of course failure.

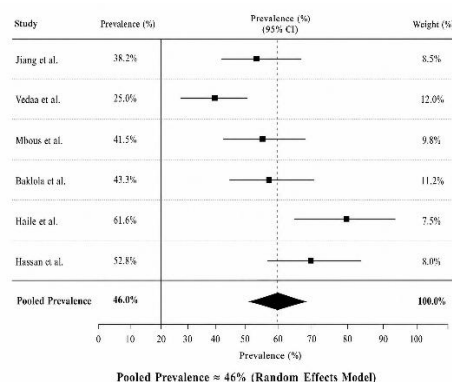
**Table 3. Impact of Insomnia on Academic Performance**

Study	Outcome Measure	Key Findings
Vedaa et al.	Academic progression	Insomnia linked to delayed completion
Mbous et al.	GPA	Lower GPA in students with insomnia
Baklola et al.	Grades	Poor academic performance associated with insomnia
Hassan et al.	GPA	Significant negative correlation
Haile et al.	Academic score	Reduced performance in insomniac students

Despite the overall consistency in findings, some studies reported non-significant associations after adjusting for confounding variables such as socioeconomic status and psychological distress [8]. This suggests that while insomnia plays a critical role, its impact on academic performance may be mediated by other factors.

Quality assessment using the Newcastle–Ottawa Scale indicated that 24 studies were of high quality, 13 of moderate quality, and 5 of low quality. High-quality studies consistently supported the association between insomnia and poor academic outcomes, strengthening the validity of the findings.

Overall, the evidence indicates that insomnia is highly prevalent among students and is significantly associated with adverse academic performance, although the strength of this association may vary depending on contextual and methodological factors.



**Figure 2. Forest Plot for Prevalence of Insomnia among Students**

## DISCUSSION

This systematic review provides a comprehensive synthesis of current evidence regarding the prevalence of insomnia among students and its impact on academic performance. The findings indicate that insomnia is highly prevalent in student populations, with most studies reporting rates between 30% and 60%, and pooled estimates approaching nearly half of the student population [15–17]. This highlights insomnia as a significant and growing public health concern within academic settings.

One of the key observations of this review is the wide variability in reported prevalence rates. This heterogeneity can be attributed to differences in study populations, diagnostic criteria, assessment tools such as the Insomnia Severity Index (ISI) and Pittsburgh Sleep Quality Index (PSQI), and cultural or environmental factors influencing sleep behavior. For instance, students in highly competitive academic environments, particularly in medical and health-related fields, consistently demonstrated higher prevalence rates. Additionally, regional variations suggest that sociocultural norms, academic systems, and lifestyle patterns play an important role in shaping sleep health [16,18].

The present review strongly supports the association between insomnia and impaired academic performance. Most included studies demonstrated that students experiencing insomnia had significantly lower GPA scores, poorer concentration, and reduced cognitive efficiency [19–21]. Sleep is essential for memory consolidation, learning, and executive functioning; therefore, disruptions in sleep directly impair the neurocognitive processes required for academic success. Chronic insomnia, in particular, was associated with cumulative academic deficits, including delayed course completion and increased risk of academic failure [20,21].

The relationship between insomnia and academic performance appears to be multifactorial and bidirectional. Academic stress is a major precipitating factor for insomnia, while insufficient or poor-quality sleep further exacerbates stress and reduces academic productivity. This cyclical interaction creates a self-perpetuating pattern that can negatively affect both educational outcomes and mental health [18,22]. Moreover, insomnia is frequently comorbid with anxiety and depression, which themselves are independently associated with poor academic performance. This suggests that the observed association between insomnia and academic outcomes may be partially mediated by underlying psychological factors [22].

Lifestyle behaviors also emerged as significant contributors to insomnia in students. Increased screen time, particularly before bedtime, exposure to blue

light, irregular sleep–wake schedules, and high caffeine intake were consistently associated with poor sleep quality [18]. These modifiable factors represent important targets for intervention. Universities and educational institutions should consider implementing sleep hygiene education, promoting structured daily routines, and providing mental health support services to mitigate these risks.

Interestingly, a subset of studies included in this review reported non-significant associations between insomnia and academic performance after adjusting for confounders such as socioeconomic status, coping mechanisms, and resilience [21]. This indicates that while insomnia is an important factor, it does not act in isolation. Academic success is influenced by a complex interplay of biological, psychological, and environmental determinants. Therefore, interventions aimed solely at improving sleep may not fully address academic difficulties unless integrated with broader student support systems.

The findings of this review have important implications for policy and practice. Early identification of insomnia through screening programs, particularly in high-risk student groups, could facilitate timely interventions. Cognitive behavioral therapy for insomnia (CBT-I), stress management strategies, and institutional policies aimed at reducing academic overload may be effective in improving both sleep quality and academic performance [23].

However, this review also underscores several limitations in the existing literature. Most included studies were cross-sectional, limiting the ability to establish causal relationships. The reliance on self-reported measures of sleep and academic performance introduces the possibility of reporting bias. Additionally, variability in measurement tools and outcome definitions contributed to heterogeneity across studies.

Despite these limitations, the overall consistency of findings across diverse settings strengthens the conclusion that insomnia is both highly prevalent and significantly associated with adverse academic outcomes among students. Future research should focus on longitudinal designs, standardized assessment methods, and interventional studies to better understand causal pathways and effective management strategies [23].

In summary, insomnia represents a critical but often underrecognized factor influencing academic performance. Addressing sleep health in students is essential not only for improving educational outcomes but also for promoting overall physical and mental well-being.

## CONCLUSION

This systematic review demonstrates that insomnia is highly prevalent among students, with a substantial proportion experiencing sleep disturbances that can adversely affect their academic performance. The evidence consistently indicates that insomnia is associated with impaired cognitive function, reduced concentration, memory deficits, and lower academic achievement, including decreased grade point averages and increased risk of academic failure.

The relationship between insomnia and academic performance is complex and multifactorial, influenced by academic stress, mental health conditions, and lifestyle behaviors such as irregular sleep patterns and excessive screen time. While some studies suggest that this association may be moderated by additional factors, the overall body of evidence supports a significant negative impact of insomnia on educational outcomes.

These findings underscore the importance of early identification and management of insomnia in student populations. Institutional strategies such as sleep hygiene education, mental health support, and academic workload optimization may play a crucial role in mitigating the burden of insomnia and improving student performance.

In conclusion, addressing insomnia is essential not only for enhancing academic success but also for promoting overall well-being among students. Future research should focus on longitudinal and interventional studies to better establish causal relationships and develop effective, evidence-based strategies for improving sleep health in academic settings.

## REFERENCES

1. Spyridonidis S, Papadopoulou D, Karanikas N. Global prevalence of insomnia symptoms among undergraduate students: a systematic review and meta-analysis. *Sleep Adv.* 2025;6(4):zpf083.
2. Jiang XL, Zheng XY, Yang J, Ye CP, Chen YY, Zhang ZG, et al. A systematic review of studies on the prevalence of insomnia in university students. *Psychol Rep.* 2020;123(6):2105–23.
3. Lund HG, Reider BD, Whiting AB, Prichard JR. Sleep patterns and predictors of disturbed sleep in a large population of college students. *J Adolesc Health.* 2010;46(2):124–32.
4. Baklola M, Alshahrani A, Alqahtani A. Prevalence of insomnia among university students: a systematic review and meta-analysis. *Egypt J Neurol Psychiatry Neurosurg.* 2024;60:114.
5. Almojali AI, Almalki SA, Allothman AS, Masuadi EM, Alaqeel MK. The prevalence and association of stress with sleep quality among medical students. *J Epidemiol Glob Health.* 2017;7(3):169–74.
6. Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. *Sleep Med Rev.* 2006;10(5):323–37.
7. Hershner SD, Chervin RD. Causes and consequences of sleepiness among college students. *Nat Sci Sleep.* 2014;6:73–84.
8. Vedaa Ø, Harvey AG, Lundervold AJ, Hysing M, Sivertsen B. Sleep problems and academic performance: a longitudinal study. *Sleep.* 2019;42(1):zsy188.
9. Taylor DJ, Bramoweth AD. Patterns and consequences of inadequate sleep in college students. *J Adolesc Health.* 2010;46(6):610–2.
10. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021;372:n71.
11. Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al. *Cochrane Handbook for Systematic Reviews of Interventions.* 2nd ed. London: Wiley; 2019.
12. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med.* 2009;6(7):e1000097.
13. Wells GA, Shea B, O'Connell D, Peterson J, Welch V, Losos M, et al. *The Newcastle–Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses.* Ottawa: Ottawa Hospital Research Institute; 2014.
14. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res.* 1989;28(2):193–213.
15. Bastien CH, Vallières A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med.* 2001;2(4):297–307.
16. Lemma S, Gelaye B, Berhane Y, Worku A, Williams MA. Sleep quality and its psychological correlates among university students. *Sleep Breath.* 2012;16(2):371–7.
17. Gaultney JF. The prevalence of sleep disorders in college students: impact on academic performance. *J Am Coll Health.* 2010;59(2):91–7.
18. Exelmans L, Van den Bulck J. Bedtime mobile phone use and sleep in adults. *Soc Sci Med.* 2016;148:93–101.
19. Dewald JF, Meijer AM, Oort FJ, Kerkhof GA, Bögels SM. The influence of sleep quality on

- academic performance. *Sleep Med Rev.* 2010;14(3):179–89.
20. Okano K, Kaczmarzyk JR, Dave N, Gabrieli JDE, Grossman JC. Sleep quality, duration, and consistency are associated with better academic performance. *NPJ Sci Learn.* 2019;4:16.
21. Alotaibi AD, Alosaimi FM, Alajlan AA, Abdulrahman KA. The relationship between sleep quality and academic performance among students. *J Family Community Med.* 2020;27(1):23–8.
22. Almojali AI, Almalki SA, Alothman AS, Masuadi EM, Alaqeel MK. Stress and sleep quality among university students: a cross-sectional study. *J Epidemiol Glob Health.* 2017;7(3):169–74.
23. Edinger JD, Means MK. Cognitive–behavioral therapy for primary insomnia. *Clin Psychol Rev.* 2005;25(5):539–58.