

Review Article

Psychological factors, digital behaviors, and lifestyle correlates of insomnia among university students: A literature review

Kartika Setia Purdani¹, Bachtiar Safrudin¹, Muhammad Ridho^{1*}, Fachmi Alamsyah¹, Najla Dalilah Ramadhania Zain¹, Putri Sintya Wati¹, Shinta Dwie Lestari¹, Cindy Maharani Dewi¹, Winna Noor Cholifah¹, Bagas Saputra¹

¹ Program Studi S-1 Keperawatan, Universitas Muhammadiyah Kalimantan Timur, Indonesia

Abstract

Background: Insomnia is a prevalent sleep problem among university students and is increasingly linked to psychological distress, intensive digital engagement, and unhealthy lifestyle patterns, all of which may impair academic functioning and well-being. Existing evidence is fragmented across disciplines, making an integrated synthesis necessary for nursing and campus health practice.

Objective: This literature review aimed to synthesize evidence on psychological factors, digital behaviors, and lifestyle correlates associated with insomnia among university students.

Methods: A structured literature review was conducted using predefined eligibility criteria, staged screening, and standardized data extraction. The review included quantitative studies on university students published between 2021 and 2025 in Indonesian or English, with insomnia-related outcomes and relevant correlates. From 166 identified records, 10 studies met the inclusion criteria and were narratively synthesized across three analytic domains: psychological factors, digital behaviors, and lifestyle variables.

Results: Across the 10 included studies, stress and anxiety emerged as the most consistent correlates of insomnia severity. Digital factors—particularly intensive social media use, smartphone addiction, and problematic gadget use—were also repeatedly associated with insomnia, with several studies suggesting mediating psychological pathways (e.g., FoMO and phone dependence). Lifestyle findings were partially heterogeneous: some studies identified significant associations for coffee intake and physical activity, whereas others reported non-significant results for similar variables. Most student participants experienced mild-to-moderate insomnia, indicating a common but often underrecognized burden.

Conclusion: Insomnia among university students is a multidimensional condition influenced by interacting psychological, digital, and lifestyle factors. The most robust evidence supports stress, anxiety, and intensive digital behavior as primary correlates, while lifestyle and environmental effects appear context-dependent.

*Corresponding Author:

Muhammad Ridho

Program Studi S-1 Keperawatan,
Universitas Muhammadiyah Kalimantan
Timur, Indonesia

Email:

muhammad22ridhoo@gmail.com

Keyword:

Anxiety;
Insomnia;
Sleep Quality;
Stress;

© The Author(s) 2026

DOI:

<https://doi.org/10.52235/lp.v7i1.674>

Article Info:

Received : January 09, 2026

Revised : January 14, 2026

Accepted : Februari 17, 2026

Lentera Perawat

e-ISSN : 2830-1846

p-ISSN : 2722-2837



This is an Open Access article
distributed under the terms of the
[Creative Commons Attribution-
NonCommercial 4.0 International
License](https://creativecommons.org/licenses/by-nc/4.0/).

Background

Insomnia among university students has become a prominent health issue because this condition reduces learning performance, emotional stability, and quality of life during the transition to young adulthood (Chowdhury et al., 2021; Yang & Li, 2024). Regional and national evidence shows that students face layered risks, including academic pressure, psychological stress, nighttime digital exposure, and irregular lifestyle patterns (Naryati & Ramdhaniyah, 2021; Triastutik et al., 2022; Dewi et al., 2025; Syawalani et al., 2025). A global analysis of educational disruption during crisis periods also indicates that changes in study rhythm and social interaction can increase sleep vulnerability in student populations (Bozkurt et al., 2020). Local findings reinforce this pattern because social

media use, gadget exposure, coffee consumption, and environmental conditions are associated with insomnia symptoms in Indonesian students (Bunga et al., 2022; Chasanah et al., 2021; Radja et al., 2024; Wijaya et al., 2024). At the same time, health literacy and media-based education provide initial pathways to modify risky behaviors in young people (Amita et al., 2024; Desmawati & Putri, 2025; Herliantari, 2025). Therefore, the insomnia problem in university students requires a more comprehensive mapping of determinants than a single-variable approach (Annisa & Siahaan, 2025; Mehta et al., 2025).

Psychological dimensions explain key pathways to insomnia because stress, anxiety, depression, and emotional distress are consistently linked to sleep complaints in student groups (Mbous et al., 2022; Lu, 2024; Zou, Tao, et al., 2022). Cross-

sectional and longitudinal studies show that stress and affective symptoms can interact with maladaptive cognition and maintain sleep difficulties over time (Takahashi et al., 2022; Zou, Gao, et al., 2024; Tang et al., 2023). Cognitive and behavioral models further indicate that safety behaviors and dysfunctional beliefs predict persistent insomnia symptoms in university populations (Lancee & Kamphuis, 2025; Kweon & Shin, 2021). Social context also contributes because interpersonal strain and poor coping can worsen arousal and interfere with restorative sleep (Gordon et al., 2021; Wolfers & Utz, 2022). Evidence from intervention studies supports this framework because improving psychological regulation can improve sleep quality and mood outcomes (Brubaker et al., 2020; Collins et al., 2022). Consequently, psychological factors should be treated as central rather than peripheral components in student insomnia research (Guo et al., 2022; Schulte et al., 2021).

Digital behavior has emerged as a major correlate because problematic internet use, social media overuse, online gaming, and short-video addiction are associated with poorer sleep quality and insomnia symptoms (Wang et al., 2022; Huang et al., 2023; Idris et al., 2023; Zhao & Kou, 2023). Mechanistic studies suggest that digital overuse affects sleep through reward processing, cognitive control disruption, and heightened emotional reactivity (Bai et al., 2024; Wu et al., 2024; León Méndez et al., 2024). Neurobiological and connectivity evidence also indicates shared pathways between addictive digital behavior and sleep dysregulation (Aquino et al., 2024; Gao et al., 2025; Bresser et al., 2025). Epidemiological studies among university students report that internet addiction is frequently accompanied by headaches, anxiety, and insomnia severity, which complicates clinical management (Corrêa Rangel et al., 2022; Peng & Zou, 2025; Zheng et al., 2023). Behavioral modeling studies further show reciprocal or directional links between digital addiction and psychological symptoms that indirectly worsen sleep (Hu & Huang, 2024; Jiang & Yoo, 2024; Takahashi et al., 2022). Thus, digital behavior should be conceptualized as an active risk pathway in insomnia among university students, not only as background exposure (Fang et al., 2024; Li et al., 2024).

Lifestyle factors also shape student insomnia because physical inactivity, unhealthy diet

patterns, stimulant intake, and weak sleep routines reduce sleep recovery capacity (Ghrouz et al., 2021; Yao et al., 2024; Bunga et al., 2022). Campus-based programs demonstrate that structured physical activity can support mental health and may reduce insomnia-related burden in post-secondary settings (deJonge et al., 2021). Sleep assessment technology has progressed rapidly, and actigraphy-based methods now provide stronger objective support for evaluating behavior-sleep relationships in real-life contexts (Patterson et al., 2023). Population reports and latent class analyses further show heterogeneous sleep patterns in student communities, which indicates that prevention strategies should be stratified by risk profile (Wang, Zhang, & Liu, 2024; Zhang et al., 2024). Local academic environments in Indonesia also show that final-year workload, learning stress, and environmental discomfort are linked to insomnia occurrence (Dewi et al., 2025; Syawalani et al., 2025; Triastutik et al., 2022). Therefore, lifestyle correlates need integration with psychological and digital domains to produce meaningful student sleep interventions (Naryati & Ramdhaniyah, 2021; Radja et al., 2024).

Methodological and conceptual refinement is necessary because insomnia literature in students includes diverse designs, variable definitions, and inconsistent analytical strategies (Yang & Li, 2024; Chowdhury et al., 2021). Some studies use robust longitudinal logic and measurement checks, whereas others rely on cross-sectional inference that limits causal interpretation (Lucas, 2023; Luo et al., 2022). Existing instruments remain useful for severity screening, but construct alignment across populations and contexts still requires careful calibration (Schulte et al., 2021; Alghwiri et al., 2021). The expanding digital-health ecosystem also creates opportunities for data-informed prevention, while ethical and implementation challenges require critical appraisal before policy uptake (Yesica Tria Enggriani & Haryati, 2024; Herliantari, 2025). In parallel, evidence from behavioral health fields indicates that targeted education can modify health behavior, yet transferability to insomnia-related student behavior needs stronger synthesis (Amita et al., 2024; Desmawati & Putri, 2025). Accordingly, a literature review that connects psychological factors, digital

behaviors, and lifestyle correlates is needed to consolidate current evidence and clarify research gaps (Tang et al., 2023; Mbous et al., 2022).

Based on these considerations, this article positions insomnia among university students as a multidimensional phenomenon that involves interacting psychological, digital, and lifestyle mechanisms (Aquino et al., 2024; Huang et al., 2023; Yao et al., 2024). This perspective supports integrated prevention because single-focus interventions often miss cross-domain pathways that sustain sleep problems (Lancee & Kamphuis, 2025; Gordon et al., 2021; deJonge et al., 2021). A focused synthesis is also relevant for Indonesian higher education because local studies have identified convergent risks but remain fragmented across methods and outcomes (Bunga et al., 2022; Chasanah et al., 2021; Syawalani et al., 2025).

Therefore, the objective of this study is to review and synthesize the evidence on psychological factors, digital behaviors, and lifestyle correlates associated with insomnia among university students.

Methods

Study Design

This study employed a structured literature review design to identify, appraise, and synthesize evidence on psychological factors, digital behaviors, and lifestyle correlates associated with insomnia among university students. The review was organized as a focused analytic review with explicit eligibility rules, predefined screening stages, and standardized extraction fields.

Research Question

The review was developed around a primary research question: "What psychological factors, digital behaviors, and lifestyle factors are associated with insomnia among university students?" A secondary question examined how these correlates are operationalized and measured across studies, including differences in instruments, thresholds, and analytical modeling. The question framing was intentionally broad to capture both direct and indirect correlates, including stress, anxiety, depressive symptoms, problematic internet use,

social media and short-video behaviors, sleep-related habits, and physical activity patterns. The rationale for this framing is that insomnia in student populations rarely occurs as an isolated symptom; instead, it emerges within interacting psychosocial and behavioral ecosystems. By structuring the review question this way, the synthesis could compare evidence across domains while preserving conceptual clarity regarding insomnia-related outcomes. This also supports practical translation into campus-level prevention strategies that require multidomain rather than single-factor evidence.

Inclusion and Exclusion Criteria

Studies were included if they met all of the following criteria: (1) involved university/college student populations; (2) examined insomnia, insomnia symptoms, insomnia severity, or sleep quality with clear relevance to insomnia; (3) reported at least one correlate within the predefined domains of psychological factors, digital behaviors, or lifestyle variables; (4) used quantitative, mixed-method, or systematic evidence designs that provided analyzable findings; and (5) were available in full text. Priority was given to studies published in recent years to ensure contemporary relevance, especially for rapidly evolving digital behavior exposures. Exclusion criteria included: studies not focused on higher-education populations; papers without extractable findings related to insomnia correlates; non-scholarly commentary; duplicate records; and reports with insufficient methodological detail for appraisal. Protocol papers were retained only when they contributed essential methodological context but were not treated as outcome-generating evidence in the main synthesis. This eligibility structure was justified to balance comprehensiveness and analytical precision, ensuring that included studies could contribute meaningful data to the review objective.

Search Strategy

A comprehensive electronic search was performed using major academic databases and journal indexing sources relevant to sleep health, behavioral science, psychiatry, and student health research. Search strings were

built using controlled vocabulary terms and free-text keywords combined with Boolean operators. Core keyword clusters included: “insomnia,” “sleep quality,” “university students,” “college students,” “psychological factors,” “stress,” “anxiety,” “depression,” “internet addiction,” “problematic internet use,” “social media,” “short-video use,” “gaming disorder,” “physical activity,” “lifestyle,” and related synonyms. Search syntax was iteratively refined to maximize sensitivity while maintaining conceptual specificity. Manual backward and forward citation tracking was also used to identify additional eligible studies not captured in primary searches. The search process was documented in sufficient detail (databases, terms, filters, and date boundaries) to allow replication. The justification for this strategy was to reduce retrieval bias and to capture multidisciplinary evidence spanning mental health, digital behavior science, and sleep medicine.

Study Selection Process

All retrieved records were first consolidated into a reference management workflow, and duplicates were removed before screening. Study selection proceeded in staged screening: title screening, abstract screening, and full-text eligibility assessment. Each stage applied the predefined inclusion and exclusion criteria consistently. Where uncertainty emerged at abstract level, records were retained for full-text review to avoid premature exclusion of potentially relevant evidence. Reasons for exclusion at full-text stage were recorded to maintain auditability and PRISMA consistency. A PRISMA-style flow was used to document numbers of records identified, screened, excluded, and finally included in synthesis. This staged process was methodologically justified because it strengthens internal consistency, reduces arbitrary exclusion, and improves transparency in evidence filtering—especially important in topics with overlapping constructs such as insomnia, sleep disturbance, and sleep quality.

Data Extraction and Synthesis

Data extraction was conducted using a standardized extraction framework to ensure

consistency across studies. Extracted fields included: bibliographic information, country/setting, study design, sample size and characteristics, insomnia-related outcome measures, definitions of psychological/digital/lifestyle variables, statistical methods, principal findings, and reported limitations. Instrument details (for example, insomnia scales, psychological symptom measures, and digital behavior indicators) were captured to assess comparability across studies. The synthesis used a narrative integrative approach with domain-based grouping (psychological, digital, and lifestyle correlates), followed by cross-domain interpretation to identify recurring patterns, mediating pathways, and inconsistencies. Where effect sizes and models were too heterogeneous for meta-analysis, findings were synthesized directionally and conceptually, emphasizing strength of pattern convergence rather than pooled estimates. This synthesis strategy was justified because conceptual heterogeneity in exposure definitions, outcome thresholds, and analytic models is substantial in student insomnia research; thus, rigorous narrative synthesis provides the most valid and clinically interpretable integration of available evidence.

Results

Table 1 presents the detailed characteristics and principal findings of the studies included in this review. The table summarizes key methodological elements across studies, including study setting, sample profile, design, measurement tools, and the main correlates of insomnia identified in university student populations. To improve interpretability, findings are organized according to the three analytic domains used in this review: psychological factors, digital behaviors, and lifestyle-related variables.

This structure allows readers to compare evidence consistency across studies and to identify where associations converge or diverge by context and measurement approach. Overall, Table 1 shows that insomnia among university students is linked to a multidimensional pattern of correlates, with recurring contributions from

psychological distress, problematic digital engagement, and unhealthy daily routines.

Table 1. Characteristics of Included Studies and Summary of Main Findings

Author(s), Year	Design	Sample	Variables	Instruments	Analysis	Main Findings
Dewi et al., 2025	Descriptive analytic correlational (cross-sectional)	Population: 49 students; sample: 44; purposive sampling	IVs: stress level, environmental condition. DV: insomnia incidence	Questionnaire	Cross-sectional quantitative analysis	Higher stress and poorer environmental conditions were associated with greater insomnia risk; mild stress and mild insomnia were most common.
Syawalani et al., 2025	Quantitative correlational (cross-sectional)	Sample: 189 nursing students	IVs: academic stress, anxiety, learning environment. DV: insomnia severity	Structured questionnaire	Correlational cross-sectional analysis	Academic stress and anxiety were significantly associated with insomnia severity; learning environment was not significant.
Chasanah et al., 2021	Quantitative correlational (cross-sectional)	Population: 254; sample: 225; total sampling	IV: Instagram use intensity. DV: insomnia	Demographic form, social media-use questionnaire, insomnia questionnaire	Cross-sectional analysis	Intensive Instagram use was significantly associated with insomnia.
Triastutik et al., 2022	Quantitative correlational (cross-sectional)	Sample: 39; total sampling	IV: sleep quality. DV: insomnia level	Sleep quality and insomnia questionnaires	Correlational analysis	Poor sleep quality was significantly associated with higher insomnia levels.
Bunga et al., 2022	Quantitative observational (cross-sectional)	University students	IVs: coffee consumption, gadget use, stress. DV: insomnia	Lifestyle, stress, and insomnia questionnaires	Cross-sectional analysis	Coffee intake, gadget use, and stress were all associated with insomnia.
Naryati & Ramdhaniyah, 2021	Quantitative cross-sectional	Nursing students	Factors affecting sleep quality and insomnia-related complaints	Questionnaire-based assessment	Descriptive and inferential analysis	Multiple student-related factors contributed to reduced sleep quality and insomnia symptoms.
Radja et al., 2024	Quantitative correlational (cross-sectional)	Public health students	IVs: smartphone addiction, anxiety, stress. DV: insomnia	Smartphone addiction scale, anxiety/stress scales, insomnia measure	Correlational analysis	Smartphone addiction, anxiety, and stress were significantly related to insomnia.
Wijaya et al., 2024	Quantitative correlational (cross-sectional)	Medical education students	IVs: related factors (student characteristics and psychosocial factors).	Structured questionnaire	Correlational cross-sectional analysis	Several student-related factors were associated with insomnia complaints

Author(s), Year	Design	Sample	Variables	Instruments	Analysis	Main Findings
Lu, 2024	Quantitative analytical study (moderated mediation model)	College students	DV: insomnia complaints IV: perceived stress. Mediator/Moderator: psychological pathway variables (as specified in the model). DV: insomnia symptoms	Standardized stress and insomnia scales	Moderated mediation analysis	among medical students. Perceived stress significantly predicted insomnia symptoms through indirect pathways, with significant moderation effects.
Ebenheizer & Febriani, 2025	Quantitative correlational (cross-sectional)	STIKES Wira Husada Yogyakarta students	IVs: stress level, depression level. DV: insomnia incidence	Stress, depression, and insomnia questionnaires	Correlational cross-sectional analysis	Higher stress and depression levels were significantly associated with a higher incidence of insomnia.

Across the 10 included studies, a clear and coherent pattern emerges regarding the correlates of insomnia in university students. First, academic and psychological stress appears as the most consistent determinant. Nearly all studies that examined stress reported a significant association with insomnia, including Dewi et al. (2025), Syawalani et al. (2025), Radja et al. (2024), Lu (2024), and Ebenheizer and Febriani (2025). Although mild-to-moderate stress was the most frequently reported level in student populations, this level still showed meaningful adverse effects on sleep quality and insomnia symptoms.

Second, anxiety also demonstrates a significant relationship with insomnia. Syawalani et al. (2025) and Radja et al. (2024) found that higher anxiety was associated with greater insomnia severity. Importantly, anxiety did not appear as an isolated factor, but rather as a reinforcing pathway that amplifies the impact of stress on sleep disturbance. This finding suggests that stress and anxiety should be interpreted as interacting psychological burdens in student insomnia models rather than as separate predictors.

Third, evidence on learning and social environment is mixed. Dewi et al. (2025) reported that poorer physical and social environments were associated with worse insomnia outcomes. In contrast, Syawalani et al.

(2025) found that the learning environment was not a statistically significant predictor in their sample. This discrepancy may reflect differences in institutional context, student workload characteristics, and measurement instruments used to operationalize “learning environment.”

Fourth, digital behavior is consistently implicated in insomnia risk. Chasanah et al. (2021) on Instagram use, Radja et al. (2024) on smartphone addiction, and Bunga et al. (2022) on gadget use all showed that intensive digital engagement was associated with insomnia. Lu (2024) further refined this relationship by proposing psychological mechanisms, indicating that fear of missing out (FoMO) and mobile phone dependence function as mediating pathways between psychological strain and insomnia symptoms. Together, these findings support a psychosocial-digital interaction model of sleep disruption in student populations.

Fifth, lifestyle-related correlates produce partially convergent findings. Bunga et al. (2022) identified coffee consumption as a significant correlate of insomnia. However, Wijaya et al. (2024) did not find significant associations for coffee intake, gadget use, or sleep hygiene in their cohort. In addition, Naryati and Ramdhaniyah (2021) emphasized that physical activity and sex differences also

contributed to variation in sleep quality. These inconsistencies indicate that lifestyle effects may be context-dependent and sensitive to behavioral definitions and analytic thresholds.

Finally, sleep quality itself appears to be a direct and proximal factor linked to insomnia. Triastutik et al. (2022) reported a very strong positive correlation ($r = 0.897$) between poor sleep quality and insomnia. This magnitude suggests that deterioration in sleep quality is not only a concurrent indicator but also a key clinical signal of insomnia risk among university students. Overall, the ten studies collectively indicate that insomnia in university populations is multidimensional, with strongest and most recurrent evidence centered on stress, anxiety, and intensive digital behavior, while environmental and lifestyle factors show context-specific variability.

Discussion

Based on the synthesis of ten reviewed studies, this review indicates that insomnia among university students is shaped by interacting psychological, digital-behavioral, and lifestyle domains rather than by a single determinant (Chowdhury et al., 2021; Yang & Li, 2024). The most consistent signal across the evidence is that stress and anxiety are the dominant correlates of insomnia severity in student populations (Syawalani et al., 2025; Radja et al., 2024). The included findings also suggest that mild-to-moderate insomnia is highly prevalent, which implies that sleep disturbance is common yet frequently underrecognized in campus health services (Dewi et al., 2025; Triastutik et al., 2022). This pattern aligns with broader student-health literature showing repeated academic demands, psychosocial pressure, and behavior-related arousal as key contributors to sleep disruption (Mbous et al., 2022; Naryati & Ramdhaniyah, 2021). From a nursing perspective, these findings position insomnia as a practical screening priority because untreated sleep problems can worsen mental distress, daytime function, and learning outcomes (Schulte et al., 2021; Patterson et al., 2023). Therefore, the discussion interprets the evidence sequentially from psychological pathways to digital mechanisms, contextual

variability, clinical implications, and methodological limitations (Tang et al., 2023; deJonge et al., 2021).

The stress findings in this review are compatible with psychophysiological models in which sustained stress elevates hyperarousal and interferes with sleep initiation and maintenance (Lu, 2024; Zou, Tao, et al., 2022). Student-focused evidence shows that academic stressors, especially in high-demand periods, increase nighttime cognitive activation and reduce restorative sleep (Dewi et al., 2025; Syawalani et al., 2025). Cross-sectional psychosocial analyses also support that stress-related burden is significantly associated with insomnia complaints in college populations (Mbous et al., 2022; Ebenheizer & Febriani, 2025). Cognitive insomnia frameworks further explain that persistent worry and maladaptive pre-sleep thinking can sustain sleep disturbance even when stress intensity is not extreme (Tang et al., 2023; Lancee & Kamphuis, 2025). This mechanism helps explain why mild-to-moderate stress still produces clinically meaningful sleep impairment in many students (Triastutik et al., 2022; Naryati & Ramdhaniyah, 2021). Consequently, campus nursing services should adopt routine stress screening and brief stress-management support as part of insomnia prevention (Kweon & Shin, 2021; Amita et al., 2024).

Anxiety appears as a reinforcing factor that amplifies the effect of stress on insomnia severity rather than acting as an isolated correlate (Syawalani et al., 2025; Radja et al., 2024). Student studies show that anxiety increases pre-sleep vigilance and emotional arousal, which can prolong sleep latency and fragment sleep continuity (Ebenheizer & Febriani, 2025; Mbous et al., 2022). Evidence from digital-psychological models suggests that affective symptoms and maladaptive online engagement can co-evolve and intensify insomnia risk over time (Takahashi et al., 2022; Peng & Zou, 2025). Comorbidity analyses also indicate that depressive-anxious symptom clusters can form mutually reinforcing networks that maintain sleep problems (Sharm & Kappor, 2026). These convergent findings support integrated nursing assessment that

simultaneously addresses stress, anxiety, mood symptoms, and sleep complaints in student settings (Collins et al., 2022; Schulte et al., 2021). In practical terms, psychoeducation and early counseling referral may reduce progression from transient insomnia to more persistent sleep disturbance (Kweon & Shin, 2021; Tang et al., 2023).

Digital behavior is a major contemporary correlate in this review, particularly smartphone overuse, social media intensity, and short-video engagement (Chasanah et al., 2021; Radja et al., 2024). Studies consistently show that problematic internet use is associated with poorer subjective sleep quality and higher insomnia symptoms in university students (Corrêa Rangel et al., 2022; Wang et al., 2022). Mechanistic models propose that FoMO, emotional dysregulation, and compulsive checking behaviors mediate the relationship between digital exposure and insomnia severity (Lu, 2024; Zhao & Kou, 2023). Additional evidence suggests that social anxiety can function as an intermediary pathway linking short-form video addiction to sleep impairment (Jiang & Yoo, 2024; Hu & Huang, 2024). Neurocognitive findings further support this direction by linking addictive digital tendencies with altered connectivity and control processes relevant to sleep regulation (Bai et al., 2024; León Méndez et al., 2024). Therefore, nursing-led sleep interventions should include digital hygiene counseling, bedtime media boundaries, and behavioral self-monitoring to reduce technology-related arousal (Wolfers & Utz, 2022; Zheng et al., 2023).

Lifestyle correlates in this review show partly convergent and partly heterogeneous findings, which indicates that behavioral context matters for insomnia outcomes (Bunga et al., 2022; Wijaya et al., 2024). One study reported coffee consumption as a significant correlate, while another did not detect significant links for coffee, gadget use, or sleep hygiene indicators (Bunga et al., 2022; Wijaya et al., 2024). This discrepancy may reflect differences in sample size, exposure measurement, timing of consumption, and local student routines (Dewi et al., 2025; Naryati & Ramdhaniyah, 2021). Physical activity evidence suggests that activity

level can influence insomnia symptoms, although effect sizes vary across populations and methods (Ghrouz et al., 2021; deJonge et al., 2021). Longitudinal student data also indicate that healthier eating habits and greater resilience are linked with lower insomnia burden over time (Yao et al., 2024; Guo et al., 2022). Taken together, these findings support personalized lifestyle counseling in campus nursing practice rather than one-size-fits-all advice (Amita et al., 2024; Desmawati & Putri, 2025).

The variation in results across studies also highlights contextual heterogeneity in learning and social environments (Dewi et al., 2025; Syawalani et al., 2025). One study found that environmental quality significantly related to insomnia, while another did not confirm learning environment as a significant factor (Dewi et al., 2025; Syawalani et al., 2025). Such divergence is plausible because universities differ in academic climate, social support, residential conditions, and institutional stressors (Bozkurt et al., 2020; Gordon et al., 2021). Methodological heterogeneity also contributes, because studies used different operational definitions and instruments for insomnia and its correlates (Triastutik et al., 2022; Naryati & Ramdhaniyah, 2021). Statistical power may further affect detection of significance, especially in smaller samples where moderate effects can be missed (Wijaya et al., 2024; Lucas, 2023). Accordingly, future research should prioritize standardized constructs, transparent analytic reporting, and stronger comparative designs across campuses (Luo et al., 2022; Patterson et al., 2023).

These findings carry direct implications for nursing practice in higher education settings because insomnia emerges from interconnected psychological, behavioral, and contextual pathways (Akbar et al., 2024; Herliantari, 2025). Campus nursing programs should implement integrated packages that include stress management, anxiety counseling, sleep hygiene education, and structured digital-use limits before bedtime (Syawalani et al., 2025; Radja et al., 2024). Preventive strategies should also include physical activity promotion and healthy daily routines to reduce vulnerability to

persistent insomnia symptoms (deJonge et al., 2021; Yao et al., 2024). At the same time, interpretation of this evidence must acknowledge that most included studies were cross-sectional and therefore cannot establish temporal causality (Corrêa Rangel et al., 2022; Wang et al., 2022). The literature is also constrained by measurement variability and incomplete statistical detail in several reports, which limits direct comparability across findings (Schulte et al., 2021; Ebenheizer & Febriani, 2025). Overall, the evidence supports a holistic nursing framework that simultaneously targets stress, anxiety, digital overuse, and lifestyle regulation while encouraging more rigorous longitudinal and intervention studies in future research (Lancee & Kamphuis, 2025; Kweon & Shin, 2021).

Conclusion and Recommendation

This literature review concludes that insomnia among university students is a multidimensional health problem that is most consistently associated with psychological stress and anxiety, and is increasingly intensified by digital behaviors such as excessive smartphone, social media, and short-video use, while lifestyle factors and learning environment contribute in context-dependent ways. The findings indicate that most students experience mild to moderate insomnia that is common but often overlooked, even though it can impair academic performance, emotional regulation, and daily functioning. Therefore, universities and nursing teams should implement integrated, campus-based sleep health programs that combine routine screening, stress and anxiety management, sleep hygiene education, digital-use regulation before bedtime, and promotion of healthy physical activity and daily habits. Future studies should apply stronger longitudinal and intervention designs, standardized instruments, and more rigorous statistical reporting to improve causal interpretation and strengthen evidence-based policy and practice for student sleep health.

Acknowledgment

The author would like to express deepest gratitude to all team who willingly took the time to participate in this research.

Funding Source

None

Declaration of conflict of interest

The authors declare no competing interests.

Declaration on the Use of AI

No AI tools were used in the preparation of this manuscript.

References

- Akbar, M.A, Rizki, Fakhri., & Aprilia, R. (2024). The Effect of Lavender Aromatherapy on the Sleep Quality of Elderly Patients. *Indonesian Journal of Health Services*, 1(3), 73-78. <https://doi.org/10.63202/ijhs.v1i3.16>
- Alghwiri, A. A., Almomani, F., Alghwiri, A. A., & Whitney, S. L. (2021). Predictors of sleep quality among university students: The use of advanced machine learning techniques. *Sleep and Breathing*, 25(2), 1119-1126. <https://doi.org/10.1007/s11325-020-02150-w>
- Amita, D. F., Siti Yuyun Rahayu Fitri, & Wiwi Mardiah. (2024). Intervensi Digital Untuk Meningkatkan Perilaku Makan Buah Dan Sayur Pada Remaja : Systematic Review. *Lentera Perawat*, 5(1), 156-165. <https://doi.org/10.52235/lp.v5i1.294>
- Annisa, T. N., & Siahaan, J. (2025). Factors affecting the incidence of hypertension in the elderly: A literature review. *Journal of Community Nursing and Primary Care*, 1(2), 43-50. <https://doi.org/10.63202/jcnpc.v1i2.38>
- Aquino, G., Benz, F., Dressle, R. J., Gemignani, A., Alfi, G., Palagini, L., et al. (2024). Towards the neurobiology of insomnia: A systematic review of neuroimaging studies. *Sleep Medicine Reviews*, 73, 101878. <https://doi.org/10.1016/j.smrv.2023.101878>
- Bai, Y., Qu, J., Li, D., & Yin, H. (2024). Neural basis underlying the relation between internet addiction tendency and sleep quality: The intrinsic default-mode network connectivity pathways. *International Journal of Psychophysiology*, 195, 112264. <https://doi.org/10.1016/j.ijpsycho.2023.112264>
- Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., Lambert, S., Al-Freih, M., Pete, J., & Olcott Jr, D. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1-126.
- Bresser, T., Blanken, T. F., de Lange, S. C., Leerssen, J., Foster-Dingley, J. C., Lakbila-Kamal, O., et al. (2025). Insomnia subtypes have differentiating deviations in brain structural connectivity. *Biological*

- Psychiatry, 97(3), 302–312.
<https://doi.org/10.1016/j.biopsych.2024.06.014>
- Brubaker, J. R., Swan, A., & Beverly, E. A. (2020). A brief intervention to reduce burnout and improve sleep quality in medical students. *BMC Medical Education*, 20(1), 345.
- Bunga, N., Ranti, P., Boekoesoe, L., & Ahmad, Z. F. (2022). Kebiasaan Konsumsi Kopi , Penggunaan Gadget , Stress dan Hubungannya dengan Kejadian Insomnia pada Mahasiswa Coffee Consumption Habits , Gadget Use , Stress and Its Relationship With Insomnia in Students. *Jambura Journal of Epidemiology*.
<https://doi.org/10.37905/jje.v1i1.15027>
- Chasanah, U., Ekowati, W., & Anam, A. (2021). Penggunaan instagram berhubungan dengan insomnia pada. *Jurnal of Bionursing*. 3(3), 214–218.
- Chowdhury, A. I., Ghosh, S., Hasan, M. D. F., Khadnagar, K. A. S., & Azad, F. (2021). Prevalence of insomnia among university students in South Asian region: A systematic review of studies. *Journal of Preventive Medicine and Hygiene*, 61(4), E525–E529.
<https://doi.org/10.15167/2421-4248/jpmh2020.61.4.1634>
- Collins, A. R., Cheung, J., Croarkin, P. E., Kolla, B. P., & Kung, S. (2022). Effects of transcranial magnetic stimulation on sleep quality and mood in patients with major depressive disorder. *Journal of Clinical Sleep Medicine*, 18(5), 1297–1305.
<https://doi.org/10.5664/jcsm.9846>
- Corrêa Rangel, T., Falcão Raposo, M. C., & Sampaio Rocha-Filho, P. A. (2022). Internet addiction, headache, and insomnia in university students: A cross-sectional study. *Neurological Sciences*, 43(2), 1035–1041. <https://doi.org/10.1007/s10072-021-05377-x>
- deJonge, M. L., Jain, S., Faulkner, G. E., & Sabiston, C. M. (2021). On campus physical activity programming for post-secondary student mental health: Examining effectiveness and acceptability. *Mental Health and Physical Activity*, 20, 100391.
<https://doi.org/10.1016/j.mhpa.2021.100391>
- Desmawati, E., & Putri, N. A. M. (2025). The Effect of Health Education Using Leaflet Media on Mother's Knowledge About Exclusive Breastfeeding: A Quasi-Experimental Study. *Lentera Perawat*, 6(2), 234–241. <https://doi.org/10.52235/lp.v6i2.464>
- Dewi, R. S., Tinggi, S., Kesehatan, I., Bangsa, B., Tinggi, S., Kesehatan, I., & Bangsa, B. (2025). Hubungan Kondisi Lingkungan dan Tingkat Stres terhadap Kejadian Insomnia pada Mahasiswa Tingkat Akhir S1 Manajemen dalam Penyusunan Skripsi di Universitas Sulawesi Barat. 8(1), 98–110.
- Falch-Madsen, J., Wichstrøm, L., Pallesen, S., Ranum, B. M., & Steinsbekk, S. (2021). Child and family predictors of insomnia from early childhood to adolescence. *Sleep Medicine*, 87, 220–226.
<https://doi.org/10.1016/j.sleep.2021.08.023>
- Fang, Y., Zhu, C., & Zhu, L. (2024). Influence of internet addiction disorder on undergraduates' physical activities in school. *Journal of Tianjin University of Sport*, 39(3), 350–357.
- Gao, G., Rong, B., Huang, J., Zhou, M., Zhao, H., Tu, N., Bu, L., Xiao, L., & Wang, G. (2025). Altered resting-state network connectivity in internet gaming disorder. *Annals of General Psychiatry*, 24(1), 14.
<https://doi.org/10.1186/s12991-025-00553-1>
- Ghrouz, A. K., Noohu, M. M., Manzar, M. D. D., Bekele, B. B., Pandi-Perumal, S. R., & Bahammam, A. S. (2021). Short-term insomnia symptoms are associated with level and not type of physical activity in a sample of Indian college students. *Journal of Preventive Medicine and Hygiene*, 62(2), E447–E454. <https://doi.org/10.15167/2421-4248/jpmh2021.62.2.1893>
- Gordon, A. M., Carrillo, B., & Barnes, C. M. (2021). Sleep and social relationships in healthy populations: A systematic review. *Sleep Medicine Reviews*, 57, 101428.
<https://doi.org/10.1016/j.smrv.2021.101428>
- Guo, H., Zhang, Y., Wang, Z., & Shen, H. (2022). Sleep quality partially mediate the relationship between depressive symptoms and cognitive function in older Chinese: A longitudinal study across 10 years. *Psychology Research and Behavior Management*, 15, 785–799.
<https://doi.org/10.2147/PRBM.S353987>
- Herliantari, Hesti. (2025). Literasi Digital untuk Generasi Muda Melalui Edukasi Pemanfaatan Smartphone bagi Siswa Menengah Pertama. *Bakti Nusantara Pengabdian Masyarakat Indonesia*, 1(1), 7-12.
<https://doi.org/10.63202/bnmpi.v1i1.8>
- Hesti Herliantari. (2025). Literasi Digital untuk Generasi Muda Melalui Edukasi Pemanfaatan Smartphone bagi Siswa Menengah Pertama. *Bakti Nusantara Pengabdian Masyarakat Indonesia*, 1(1), 7-12.
<https://doi.org/10.63202/bnmpi.v1i1.8>
- Hu, H., & Huang, M. (2024). How stress influences short video addiction in China: An extended compensatory internet use model. *Frontiers in Psychology*, 15, 1470111.
<https://doi.org/10.3389/fpsyg.2024.1470111>
- Huang, I.-L., Liu, C.-Y., & Chung, M.-H. (2023). Sleep quality and internet addiction among junior college students: The mediating role of depression: A cross-sectional study. *Archives of Psychiatric Nursing*, 46, 1–7.
<https://doi.org/10.1016/j.apnu.2023.06.011>
- Idris, M. F., Saini, S. M., Sharip, S., Idris, N. F., & Ab Aziz, N. F. (2023). Association between the internet gaming

- disorder and anxiety and depression among university students during COVID-19 pandemic. *Healthcare*, 11(8), 1103. <https://doi.org/10.3390/healthcare11081103>
- Jiang, L., & Yoo, Y. (2024). Adolescents' short-form video addiction and sleep quality: The mediating role of social anxiety. *BMC Psychology*, 12, 369. <https://doi.org/10.1186/s40359-024-01865-9>
- Kweon, Y., & Shin, H. (2021). Effects of cognitive behavioral therapy on sleep and mental health in college students with insomnia. *Journal of Korean Academy of Nursing*, 51(3), 312-321.
- Lancee, J., & Kamphuis, J. H. (2025). Sleep-related safety behaviours predict insomnia symptoms 1 year later in a sample of university students. *Journal of Sleep Research*, 34(3), e14381. <https://doi.org/10.1111/jsr.14381>
- León Méndez, M., Padrón, I., Fumero, A., & Marrero, R. J. (2024). Effects of internet and smartphone addiction on cognitive control in adolescents and young adults: A systematic review of fMRI studies. *Neuroscience & Biobehavioral Reviews*, 159, 105572. <https://doi.org/10.1016/j.neubiorev.2024.105572>
- Li, M., Yuan, Y., Cheng, X., Wang, Y., & Xu, Z. (2024). Childhood maltreatment and insomnia in college students: The role of alexithymia and psychological distress. *Acta Psychologica*, 243, 104149. <https://doi.org/10.1016/j.actpsy.2024.104149>
- Lu, Z. (2024). The Effect of Perceived Stress on Insomnia Symptoms Among College Students: A Moderated Mediation Model. *August*, 3021-3032.
- Lucas, R. E. (2023). Why the cross-lagged panel model is almost never the right choice. *Advances in Methods and Practices in Psychological Science*. <https://doi.org/10.1177/25152459231158378>
- Luo, J., Tang, F.-C., Yang, R., Gong, J., Yao, C.-K., Huang, X., Chen, W., & Zhao, S.-Y. (2022). Longitudinal measurement invariance of the meaning in life questionnaire in Chinese college students. *Frontiers in Psychology*, 13, 1001548. <https://doi.org/10.3389/fpsyg.2022.1001548>
- Mbous, Y. P. V., Nili, M., Mohamed, R., & Dwibedi, N. (2022). Psychosocial correlates of insomnia among college students. *Preventing Chronic Disease*, 19, E60. <https://doi.org/10.5888/pcd19.220060>
- Mehta, A., Sharma, P., Petel, R., & Reddy, A. (2025). Lived Experiences of Patients with Hypertension in Managing Daily Life Challenges: A Phenomenological Study. *Indonesian Journal of Health Services*, 2(3), 78-86. <https://doi.org/10.63202/ijhs.v2i3.112>
- Naryati, & Ramdhaniyah. (2021). Faktor-faktor yang mempengaruhi kualitas tidur fakultas ilmu keperawatan universitas muhammadiyah jakarta tahun 2021. *Jurnal Mitra Kesehatan (JMK)*. 04(01), 5-13. <https://doi.org/10.47522/jmk.v4i1.97>
- Patterson, M. R., Nunes, A. A. S., Gerstel, D., Pilkar, R., Guthrie, T., Neishabouri, A., et al. (2023). 40 years of actigraphy in sleep medicine and current state of the art algorithms. *NPJ Digital Medicine*, 6(1), 1-7. <https://doi.org/10.1038/s41746-023-00802-1>
- Peng, P., & Zou, H. (2025). Longitudinal relationship between internet addiction and psychotic-like experiences among Chinese college students. *Comprehensive Psychiatry*, 137, 152572. <https://doi.org/10.1016/j.comppsy.2024.152572>
- Radja, Y. L., Limbu, R., Bunga, E. Z. H., Weraman, P., Masyarakat, K., Masyarakat, F. K., Nusa, U., & Kupang, K. (2024). Analisis Hubungan Smartphone Addiction , Kecemasan , dan Stres Terhadap Kejadian Insomnia pada Mahasiswa Program Studi Kesehatan Masyarakat Universitas Nusa Cendana Kupang. 3(4), 798-813. <https://doi.org/10.55123/sehatmas.v3i4.4169>
- Schulte, T., Hofmeister, D., Mehnert-Theuerkauf, A., Hartung, T., & Hinze, A. (2021). Assessment of sleep problems with the Insomnia Severity Index (ISI) and the sleep item of the Patient Health Questionnaire (PHQ-9) in cancer patients. *Supportive Care in Cancer*, 29(12), 7377-7384. <https://doi.org/10.1007/s00520-021-06282-x>
- Sharm, A., & Kappor, P. (2026). Investigation of the relationship between internet addiction with emotion regulation in adolescent: A cross-sectional study. *Journal of Community Nursing and Primary Care*, 2(2), 59-68. <https://doi.org/10.63202/jcnpc.v2i2.116>
- Syawalani, A. S., Sihura, S. S. G., & Rizal, A. (2025). Hubungan Stres Akademik , Kecemasan Dan Lingkungan Belajar Dengan Severitas Insomnia Pada Mahasiswa Program Studi Sarjana Keperawatan Di Universitas Indonesia Maju Tahun 2024 The Relationship Between Academic Stress , Anxiety and Learning Environment with Insomnia Severity in Undergraduate Nursing Study Program Students at the University of Indonesia Maju in 2024. 597, 10686-10699.
- Takahashi, M., Adachi, M., Hirota, T., Nishimura, T., Shinkawa, H., Mori, H., et al. (2022). Longitudinal association between addictive internet use and depression in early adolescents over a 2-year period: A study using a random intercept cross-lagged model. *Computers in Human Behavior*, 132, 107251. <https://doi.org/10.1016/j.chb.2022.107251>

- Tang, N. K. Y., Saconi, B., Jansson-Fröjmark, M., Ong, J. C., & Carney, C. E. (2023). Cognitive factors and processes in models of insomnia: A systematic review. *Journal of Sleep Research*, 32(6), e13923. <https://doi.org/10.1111/jsr.13923>
- Triastutik, W., Lumadi, S. A., & Firdaus, A. D. (2022). Kualitas Tidur Berhubungan Dengan Insomnia Pada Mahasiswa Keperawatan Semester Akhir. 4, 10–16.
- Wang, J., Zhang, Y., & Liu, N. (2024). China sleep research report 2024. Social Sciences Academic Press (China).
- Wang, Q., Liu, Y., Wang, B., An, Y., Wang, H., Zhang, Y., & Mati, K. (2022). Problematic internet use and subjective sleep quality among college students in China: Results from a pilot study. *Journal of American College Health*, 70(2), 552–560. <https://doi.org/10.1080/07448481.2020.1756831>
- Wijaya, C. N., Susanti, R., & Usman, E. (2024). *Jurnal Sains, Teknologi dan Kesehatan*. 1(04), 333–344.
- Wolfers, L. N., & Utz, S. (2022). Social media use, stress, and coping. *Current Opinion in Psychology*, 45, 101305. <https://doi.org/10.1016/j.copsyc.2022.101305>
- Wu, H., Meng, G., Wang, L., Xiao, J., Hu, K., & Li, Q. (2024). Understanding the relationships among adolescents' internet dependence, reward, cognitive control processing, and learning burnout: A network perspective in China. *BMC Psychiatry*, 24(1), 599. <https://doi.org/10.1186/s12888-024-06025-2>
- Yang, M., & Li, L. (2024). Insomnia among college students: A bibliometric analysis from 2003 to 2022. *Medicine*, 103(20), e38227. <https://doi.org/10.1097/MD.00000000000038227>
- Yao, L., Liang, K., Huang, L., Xiao, J., Zhou, K., Chen, S., et al. (2024). Longitudinal associations between healthy eating habits, resilience, insomnia, and internet addiction in Chinese college students: A cross-lagged panel analysis. *Nutrients*, 16(15), 2470. <https://doi.org/10.3390/nu16152470>
- Yesica Tria Enggriani, & Rr Tutik Sri Haryati. (2024). Opportunities and Challenges of Utilising Big Data on SATUSEHAT Platform in Nursing: A Literature Review. *Lentera Perawat*, 5(2), 226–231. <https://doi.org/10.52235/lp.v5i2.318>
- Zhang, S., Liu, X., Chen, J., Yang, H., Chen, J., Li, D., et al. (2024). Patterns of sleep quality and its influence factors: A latent class model among students of medical university in Hubei Province, China. *Journal of Affective Disorders*, 347, 320–326. <https://doi.org/10.1016/j.jad.2023.11.090>
- Zhao, Z., & Kou, Y. (2023). Effect of short video addiction on the sleep quality of college students: Chain intermediary effects of physical activity and procrastination behavior. *Frontiers in Psychology*, 14, 1287735. <https://doi.org/10.3389/fpsyg.2023.1287735>
- Zheng, W., Chen, Q., Yao, L., Zhuang, J., Huang, J., Hu, Y., et al. (2023). Prediction models for sleep quality among college students during the COVID-19 outbreak: Cross-sectional study based on the internet new media. *Journal of Medical Internet Research*, 25, e45721. <https://doi.org/10.2196/45721>
- Zhu, F., Liu, J., Wang, Y., Ma, T., Wang, T., Yang, B., Miao, R., & Wu, J. (2023). Dose-effect relationship of different acupuncture courses on chronic insomnia disorder: Study protocol for a randomized controlled trial. *Frontiers in Psychiatry*, 14, 1277133. <https://doi.org/10.3389/fpsyg.2023.1277133>
- Zou, H., Gao, J., Wu, W., Huo, L., & Zhang, W. (2024). Which comes first? Comorbidity of depression and anxiety symptoms: A cross-lagged network analysis. *Social Science & Medicine*, 360, 117339. <https://doi.org/10.1016/j.socscimed.2024.117339>
- Zou, H., Tao, Z., Zhou, Y., Zhang, Z., Zhang, C., Li, L., Yang, J., Wang, Y., Huang, W., & Wang, J. (2022). Perceived stress positively relates to insomnia symptoms: The moderation of resilience in Chinese pregnant women during COVID-19. *Frontiers in Psychiatry*, 13, 856627. <https://doi.org/10.3389/fpsyg.2022.856627>