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The Impact of Sleep Hygiene on Cognitive Functioning, Mental Health, and Physical Performance in Young Adults: A Narrative Review of the Literature

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ABSTRACT

Sleep hygiene encompasses behavioral and environmental practices that shape sleep quality and circadian stability. Among young adults, lifestyle demands, academic pressures, and widespread digital media use contribute to irregular sleep–wake schedules, shortened sleep duration, and increasing sleep disturbances. This narrative review synthesizes research from sleep medicine, psychology, and public health to examine how sleep hygiene relates to cognitive performance, psychological well-being, and physical functioning in young adults. Evidence indicates that inconsistent sleep timing, evening light exposure, and stimulating pre-sleep activities are linked to impaired attention, reduced learning efficiency, and poorer executive functioning. Poor sleep hygiene is also associated with heightened emotional reactivity, greater risk of anxiety and depressive symptoms, and impaired stress regulation. Physiological consequences include altered neuroendocrine rhythms, reduced recovery capacity, and declines in physical performance. Intervention studies show that adopting regular sleep schedules, minimizing nocturnal screen exposure, and optimizing sleep environments can improve sleep quality, daytime functioning, and mental health. Taken together, sleep hygiene emerges as a modifiable and cost-effective determinant

of health in young adults. Integrating sleep-supportive behaviors into preventive medicine, education, and public health initiatives may help protect cognitive, emotional, and physical functioning during this critical developmental period.
Keywords: sleep hygiene, young adults, cognitive performance, psychological well-being, circadian rhythm, physical functioning

INTRODUCTION AND PURPOSE

Sleep constitutes a fundamental biological process essential for cognitive efficiency, emotional regulation, and physiological homeostasis [1–3]. Adequate sleep quantity and quality are crucial for maintaining optimal functioning, particularly during young adulthood, a life stage characterized by heightened neurocognitive demands, social role transitions, and increased exposure to behavioral and environmental stressors [4–6]. Despite extensive scientific evidence underscoring the importance of sleep, disturbances in sleep patterns have become increasingly prevalent in this population, raising concerns regarding their short- and long-term consequences [7–9].

In recent decades changes in lifestyle, academic expectations, occupational demands, and widespread access to digital technologies have profoundly altered sleep behaviors among young adults [10–12]. Irregular sleep–wake schedules, delayed bedtimes, shortened sleep duration, and increased variability between weekday and weekend sleep patterns are commonly observed [13–15]. These behaviors often coexist with environmental factors such as excessive light exposure, noise, and inconsistent sleep environments, further contributing to sleep disruption [16, 17]. Importantly, such disturbances frequently occur in the absence of diagnosed sleep disorders, suggesting that behavioral and contextual determinants play a central role in shaping sleep outcomes in this age group [18, 19].

Within this context, the concept of sleep hygiene has gained increasing attention in sleep research and public health [20, 21]. Sleep hygiene refers to a set of behavioral and environmental practices intended to promote regular, restorative sleep and alignment with endogenous circadian rhythms [21–23]. These practices include maintaining consistent sleep schedules, optimizing the sleep environment, regulating exposure to stimulating activities and substances as well as adopting

routines that facilitate sleep onset and continuity [22–24]. Unlike pharmacological interventions, sleep hygiene represents a low-cost, non-invasive, and potentially scalable approach to improving sleep-related outcomes [25].

Young adulthood represents a particularly relevant period for examining the role of sleep hygiene due to its unique developmental characteristics [26]. Neurological maturation, particularly of prefrontal cortical regions involved in executive control and emotional regulation, continues into the mid-twenties [27, 28]. Concurrently, young adults are exposed to increasing academic, professional, and social responsibilities that may compete with sleep priorities [29]. As a result, sleep behaviors during this period may exert disproportionate effects on cognitive performance, mental health, and physical functioning, with implications extending into later adulthood [30].

Cognitive functioning is especially sensitive to sleep-related disruptions [31, 32]. Attention, working memory, executive processes, and learning efficiency are highly dependent on sleep continuity and circadian alignment [32–34]. Even modest reductions in sleep duration or increases in sleep variability have been associated with measurable declines in cognitive performance [35]. For young adults engaged in intensive learning or cognitively demanding work, these impairments may translate into reduced academic achievement, decreased productivity, and compromised decision-making [36]. Understanding the role of sleep hygiene in modulating these outcomes is therefore of both theoretical and practical significance [31–36].

Mental health outcomes constitute another critical domain influenced by sleep hygiene [37]. Young adulthood is a period marked by elevated vulnerability to mood and anxiety disorders, with sleep disturbances frequently co-occurring with psychological distress [38, 39]. Poor sleep hygiene has been linked to increased emotional reactivity, impaired stress regulation, and heightened risk of depressive and anxiety symptoms [37–39]. The bidirectional relationship between sleep and mental health further complicates this association, as psychological distress may exacerbate maladaptive sleep behaviors, creating a self-reinforcing cycle [38, 40]. Clarifying the role of sleep hygiene within this dynamic is essential for developing effective preventive and therapeutic strategies [37–40].

In addition to cognitive and psychological outcomes, sleep hygiene plays a significant role in physical functioning and overall physiological resilience [11, 12,]. Adequate sleep is necessary for metabolic regulation, immune function, hormonal balance, and tissue recovery [11, 12]. Disrupted sleep behaviors may impair physical performance, increase fatigue, and reduce tolerance to physical and cognitive stressors [39]. While much of the existing literature has focused on athletic

populations, the relevance of sleep hygiene for physical functioning extends to the broader population of young adults, including students and early-career professionals [11–13, 40].

Despite growing interest in sleep hygiene, the existing literature is characterized by conceptual and methodological heterogeneity [20, 21]. Definitions of sleep hygiene vary across studies, and measurement tools often overlap with constructs such as sleep quality or insomnia symptoms [21, 23]. Moreover, the majority of studies rely on self-reported data and cross-sectional designs, limiting causal inference [24, 25]. These methodological challenges underscore the need for narrative synthesis that critically integrates findings across diverse research approaches, identifies consistent patterns, and highlights gaps in current knowledge [20–25].

The purpose of the present narrative review is to synthesize and critically evaluate the scientific literature examining the impact of sleep hygiene on cognitive functioning, mental health, and physical performance in young adults [1–40]. By integrating evidence from empirical studies and theoretical models, this review aims to provide a comprehensive overview of current knowledge, identify key mechanisms underlying observed associations, and discuss methodological limitations within the field. Additionally, the review seeks to highlight the relevance of sleep hygiene as a modifiable determinant of health and functioning, with implications for preventive strategies, educational interventions, and public health policy [1–40].

METHODOLOGY

This narrative review was designed to synthesize and critically appraise current evidence on the relationship between sleep hygiene and cognitive, psychological, and physical outcomes in young adults. A comprehensive literature search was conducted between January and March 2025 in PubMed, Scopus, Web of Science, and Google Scholar. The following keyword combinations were used: *sleep hygiene*, *young adults*, *sleep quality*, *cognition*, *mental health*, *depression*, *anxiety*, *circadian rhythm*, and *physical performance*. Additional relevant papers were identified by screening reference lists of included articles.

We considered empirical studies, systematic reviews, and theoretical papers published in English, with primary samples including adolescents and young adults (approximately 16–35 years). Papers focusing exclusively on clinical sleep disorders (e.g., obstructive sleep apnea, narcolepsy) were excluded unless they provided relevant insight into behavioral sleep practices. No lower date limit was imposed to capture foundational work; however, preference was given to research published within the last 20 years.

Titles and abstracts were screened independently by two authors, and potentially eligible full texts were reviewed for relevance. Data extraction focused on definitions of sleep hygiene, assessment tools, study design, and reported cognitive, psychological, and physiological outcomes. Given the heterogeneity of methodologies and outcomes, a traditional meta-analysis was not appropriate. Instead, results were synthesized thematically, with attention to recurring mechanisms, areas of consensus, and methodological limitations. This approach allowed integration of findings across disciplines while highlighting gaps that warrant further investigation.

STATE OF KNOWLEDGE

Biological and Behavioral Mechanisms Linking Sleep Hygiene and Sleep Regulation

Sleep regulation is governed by the dynamic interaction between homeostatic sleep pressure and circadian rhythmicity. The homeostatic process reflects the accumulation of sleep drive during wakefulness, while the circadian system synchronizes sleep–wake timing with environmental cues, primarily the light–dark cycle [1–3]. Sleep hygiene behaviors directly influence both mechanisms, shaping sleep onset, continuity, and subjective sleep quality.

Irregular sleep schedules, a hallmark of poor sleep hygiene among young adults, disrupt circadian entrainment and weaken the stability of internal biological rhythms [4, 5]. Variability in bedtime and wake-up time, particularly pronounced differences between weekdays and weekends, contributes to circadian misalignment commonly described as social jet lag [6, 7]. This misalignment impairs the temporal coordination between central circadian pacemakers and peripheral physiological processes, resulting in fragmented sleep and reduced restorative efficiency [6–8].

Light exposure represents one of the most potent behavioral modulators of circadian timing. Evening exposure to artificial light, especially short-wavelength (blue) light emitted by electronic devices, suppresses melatonin secretion and delays circadian phase [9–11]. As a consequence, sleep onset latency increases and total sleep duration is reduced, particularly when early wake times are socially imposed [10–12]. These effects are highly relevant for young adults who exhibit high levels of nighttime digital media use and increased sensitivity to circadian phase shifts [11–13].

Beyond circadian effects, sleep hygiene behaviors influence sleep through mechanisms of cognitive and physiological arousal. Engaging in stimulating activities before bedtime, such as intensive screen use, academic work, or emotionally salient social interactions, increases cortical activation

and sympathetic nervous system activity [14–16]. Elevated arousal interferes with the transition from wakefulness to sleep, prolongs sleep onset latency, and increases nocturnal awakenings [15, 16]. Over time, repeated associations between the sleep environment and heightened arousal may condition maladaptive sleep patterns, further perpetuating sleep difficulties [17, 18].

Substance use constitutes another behavioral pathway linking sleep hygiene to sleep regulation. Caffeine consumption in the afternoon or evening delays sleep onset by antagonizing adenosine receptors and reducing homeostatic sleep pressure [19, 20]. Alcohol, although commonly perceived as sleep-promoting, disrupts sleep architecture by increasing nocturnal awakenings and suppressing rapid eye movement sleep during the second half of the night [21, 22]. These effects are particularly pronounced when combined with irregular sleep schedules, amplifying cumulative sleep disruption [20–22].

Environmental components of sleep hygiene, including noise, temperature, and bedroom conditions, further modulate sleep continuity and depth. Exposure to environmental noise increases micro-arousals and reduces slow-wave sleep, even in individuals who do not consciously awaken [23, 24]. Suboptimal bedroom temperature and inadequate sleep surfaces may impair thermoregulation and comfort, contributing to sleep fragmentation and reduced subjective sleep quality [24, 25]. Young adults living in shared or transitional housing environments may be disproportionately affected by such factors, limiting their capacity to maintain optimal sleep conditions [25, 26].

Physiologically, poor sleep hygiene is associated with dysregulation of neuroendocrine systems involved in stress and recovery. Irregular sleep patterns and insufficient sleep duration alter cortisol rhythms, often resulting in elevated evening levels and blunted morning peaks [27, 28]. These alterations may impair emotional regulation, cognitive flexibility, and metabolic homeostasis. Additionally, disrupted sleep hygiene may affect secretion of growth hormone and other anabolic hormones critical for tissue repair and physical recovery [29, 30].

Importantly, the impact of sleep hygiene on sleep regulation is cumulative and context-dependent. Occasional deviations from optimal sleep practices may be well tolerated; however, chronic exposure to poor sleep hygiene behaviors leads to progressive deterioration in sleep quality and daytime functioning [31–33]. Young adults, due to developmental, social, and environmental factors, appear particularly vulnerable to these cumulative effects [34, 35].

Despite substantial evidence linking sleep hygiene behaviors to sleep regulation, methodological limitations persist. Many studies rely on cross-sectional designs and self-reported measures of sleep

hygiene, limiting causal inference and precision [20, 21]. Moreover, overlap between sleep hygiene constructs and measures of sleep quality complicates interpretation, as behaviors and outcomes are sometimes assessed using overlapping items [22, 23]. These limitations highlight the need for longitudinal and experimental studies employing standardized and objective assessment methods to clarify causal pathways [24, 25].

In summary, sleep hygiene behaviors influence sleep regulation through multiple biological and behavioral mechanisms, including circadian alignment, arousal modulation, environmental optimization, and neuroendocrine regulation. These mechanisms provide a conceptual foundation for understanding how modifiable daily behaviors translate into measurable differences in sleep quality and, ultimately, cognitive, psychological, and physical functioning among young adults [1–40].

Sleep Hygiene and Cognitive Functioning in Young Adults

Cognitive functioning is highly sensitive to sleep quantity, quality, and regularity. Adequate sleep supports attentional control, executive functioning, working memory, learning efficiency, and decision-making processes, all of which are critical for academic and occupational performance in young adulthood [5, 12–14]. Sleep hygiene behaviors shape these cognitive processes indirectly by influencing sleep continuity and circadian alignment, and directly through modulation of neurophysiological arousal and recovery mechanisms [1, 6].

Empirical evidence consistently demonstrates that poor sleep hygiene is associated with impairments in sustained attention and vigilance. Irregular sleep schedules and insufficient sleep duration increase reaction time variability, attentional lapses, and error rates in tasks requiring continuous monitoring [14–16]. These deficits are particularly pronounced during monotonous or prolonged cognitive tasks, suggesting that inadequate sleep hygiene compromises the ability to maintain stable alertness over time [15, 17].

Working memory capacity and executive functions are especially vulnerable to sleep-related disruptions. Experimental studies indicate that sleep restriction and circadian misalignment impair cognitive flexibility, inhibitory control, and planning abilities [6, 18]. These functions depend heavily on prefrontal cortical networks, which exhibit heightened sensitivity to sleep loss and fragmented sleep [24]. Neuroimaging findings reveal reduced metabolic activity and altered functional connectivity within frontal brain regions following periods of inadequate or irregular sleep [13, 24].

Learning and memory consolidation constitute another domain strongly influenced by sleep hygiene. Sleep facilitates the stabilization and integration of newly acquired information, particularly during slow-wave and rapid eye movement sleep stages [25–27]. Poor sleep hygiene behaviors, including delayed bedtimes, frequent nocturnal awakenings, and inconsistent sleep–wake schedules, disrupt these consolidation processes, resulting in diminished retention of declarative knowledge and impaired acquisition of procedural skills [26–28]. Importantly, these effects have been observed even in individuals who do not meet clinical criteria for sleep disorders, underscoring the relevance of everyday sleep behaviors [27].

Academic performance outcomes provide an ecologically valid indicator of the cognitive consequences of poor sleep hygiene. Observational studies among university students demonstrate associations between irregular sleep patterns, short sleep duration, and lower grade point averages, reduced concentration during lectures, and impaired examination performance [3, 19]. Excessive daytime sleepiness, often resulting from cumulative sleep debt, further exacerbates these effects by reducing motivation and engagement in cognitively demanding activities [9, 10].

Circadian misalignment plays a central role in mediating the cognitive impact of sleep hygiene. Social jet lag, characterized by discrepancies between biological and socially imposed sleep schedules, has been linked to reduced cognitive efficiency, impaired attention, and slower information processing [6, 40]. Young adults are particularly susceptible to social jet lag due to late chronotypes, academic obligations, and evening social activities, which collectively undermine circadian stability [7, 24].

Sleep hygiene behaviors also influence cognition through interactions with emotional regulation and stress reactivity. Insufficient or fragmented sleep amplifies emotional responses to negative stimuli and reduces top-down cognitive control over affective processes [10, 36]. Heightened emotional reactivity may interfere with concentration, working memory, and decision-making, particularly under stress [32, 36]. These interactions highlight the interconnected nature of cognitive and emotional domains in the context of sleep hygiene.

Methodological considerations are essential when interpreting the literature on sleep hygiene and cognition. Many studies rely on self-reported sleep measures and cross-sectional designs, limiting causal inference [20, 33]. Additionally, variability in operational definitions of sleep hygiene complicates comparisons across studies. Despite these limitations, converging evidence from

experimental sleep restriction paradigms, observational studies, and intervention trials supports a robust association between sleep hygiene behaviors and cognitive functioning [14–18].

Intervention studies provide further support for the causal role of sleep hygiene in cognitive outcomes. Educational and behavioral programs promoting regular sleep schedules, reduced evening screen exposure, and improved sleep environments have demonstrated improvements in attention, daytime alertness, and subjective cognitive performance in young adults [32, 40]. These findings suggest that cognitive impairments associated with poor sleep hygiene are, at least partially, reversible through targeted behavioral modification.

In summary, sleep hygiene constitutes a critical behavioral determinant of cognitive functioning in young adults. Poor adherence to sleep hygiene principles is associated with impairments in attention, working memory, executive functioning, and learning processes, with meaningful implications for academic and occupational performance. Given the modifiable nature of sleep hygiene behaviors, interventions targeting sleep-related practices represent a promising avenue for enhancing cognitive efficiency and resilience during young adulthood [1–40].

Sleep Hygiene and Psychological Well-Being in Young Adults

Psychological well-being is intricately linked to sleep regulation, with sleep hygiene functioning as a central behavioral determinant of mental health in young adulthood. This developmental stage is characterized by heightened emotional reactivity, increased exposure to psychosocial stressors, and evolving regulatory capacities, all of which render young adults particularly vulnerable to the mental health consequences of inadequate sleep behaviors [7, 8, 29].

A substantial body of evidence demonstrates that poor sleep hygiene is associated with increased prevalence and severity of depressive symptoms. Irregular sleep–wake schedules, insufficient sleep duration, and fragmented sleep contribute to mood dysregulation, anhedonia, and reduced emotional resilience [7, 8, 21]. Longitudinal studies suggest that sleep disturbances frequently precede the onset of depressive episodes, supporting the hypothesis that maladaptive sleep behaviors may serve as an early risk factor rather than merely a consequence of depression [7, 29].

Neurobiological mechanisms underlying these associations involve dysregulation of monoaminergic neurotransmitter systems, altered hypothalamic–pituitary–adrenal axis activity, and impaired synaptic plasticity [10, 11, 35]. Chronic sleep disruption has been linked to elevated cortisol levels and blunted diurnal cortisol rhythms, which may contribute to sustained stress

responses and vulnerability to affective disorders [26, 38]. These mechanisms underscore the role of sleep hygiene in maintaining emotional homeostasis and psychological stability.

Anxiety-related outcomes are similarly influenced by sleep hygiene behaviors. Poor pre-sleep routines, heightened cognitive arousal before bedtime, and inconsistent sleep timing are associated with increased anxiety symptoms and sleep-related worry [30,37]. Over time, these patterns may establish a self-perpetuating cycle in which anxiety impairs sleep hygiene adherence, while inadequate sleep exacerbates anxiety symptomatology [31,37]. This bidirectional relationship complicates causal inference, but highlights sleep hygiene as a modifiable point of intervention.

Emotional regulation represents a critical intermediary between sleep hygiene and psychological well-being. Adequate sleep supports the functional integrity of prefrontal–limbic networks responsible for regulating emotional responses [10, 36]. In contrast, insufficient or irregular sleep weakens top-down cognitive control over emotional reactivity, leading to heightened sensitivity to negative stimuli, irritability, and reduced tolerance for stress [36]. These effects are particularly pronounced in young adults facing academic deadlines, social pressures, and occupational demands [19, 38].

Stress perception and stress recovery are also closely linked to sleep hygiene. Chronic sleep insufficiency amplifies physiological stress responses, impairs autonomic regulation, and prolongs recovery following stressful events [17, 38]. Young adults with poor sleep hygiene report higher levels of perceived stress, burnout symptoms, and emotional exhaustion, particularly in academic and work-related contexts [19, 39]. These findings suggest that sleep hygiene not only influences baseline psychological functioning but also shapes adaptive capacity under stress.

The role of circadian misalignment merits particular attention in the context of mental health. Social jet lag has been associated with depressive symptoms, emotional instability, and reduced subjective well-being [40]. Misalignment between biological and social time disrupts daily mood regulation and may exacerbate vulnerability to affective disorders, especially among individuals with late chronotypes [24, 40]. Given the prevalence of social jet lag in young adult populations, this mechanism represents a critical target for preventive interventions.

Intervention studies provide converging evidence for the psychological benefits of improving sleep hygiene. Educational and behavioral programs focusing on regular sleep schedules, reduced evening exposure to electronic media, and stress-reducing pre-sleep routines have demonstrated reductions in depressive and anxiety symptoms, alongside improvements in emotional regulation and perceived

well-being [32, 40]. Importantly, these effects have been observed in non-clinical populations, emphasizing the preventive potential of sleep hygiene interventions.

Methodological limitations must be acknowledged. Much of the existing literature relies on self-report measures of sleep hygiene and psychological outcomes, increasing susceptibility to reporting bias and shared method variance [33, 34]. Nevertheless, the consistency of findings across observational, longitudinal, and intervention studies strengthens confidence in the observed associations.

In summary, sleep hygiene plays a pivotal role in shaping psychological well-being in young adults. Poor adherence to sleep hygiene principles is associated with increased risk of depressive and anxiety symptoms, heightened stress reactivity, and impaired emotional regulation. Given the bidirectional nature of sleep and mental health, interventions targeting sleep hygiene may offer a valuable strategy for both prevention and early intervention in mental health promotion during young adulthood [7–40].

Sleep Hygiene and Physical Performance in Young Adults

Physical performance and physiological functioning are strongly dependent on sleep continuity, duration, and circadian regularity. Sleep constitutes a critical biological window for tissue repair, neuromuscular recovery, metabolic regulation, and hormonal homeostasis, all of which are essential for maintaining physical capacity and resilience [26–28]. Sleep hygiene behaviors directly shape these processes by influencing both sleep architecture and circadian alignment.

Empirical studies demonstrate that poor sleep hygiene, characterized by irregular sleep schedules, insufficient sleep duration, and frequent nocturnal disturbances, is associated with diminished physical performance across multiple domains. These include reduced endurance capacity, impaired reaction time, decreased motor coordination, and slower psychomotor responses [27, 28]. Even modest deviations from recommended sleep practices may result in measurable decrements in physical functioning, underscoring the sensitivity of performance outcomes to everyday sleep behaviors [18, 28].

Neuroendocrine mechanisms represent a central pathway through which sleep hygiene affects physical performance. Inadequate or fragmented sleep disrupts the secretion of anabolic hormones, including growth hormone and testosterone, while simultaneously increasing catabolic processes mediated by cortisol [26–28]. These alterations impair muscle protein synthesis, delay recovery

following physical exertion, and contribute to cumulative fatigue. Over time, chronic dysregulation of these systems may reduce training adaptation and physical resilience, even in young and otherwise healthy individuals [27, 28].

Sleep hygiene also influences neuromuscular coordination and reaction speed. Sleep restriction and circadian misalignment have been shown to impair motor learning, fine motor control, and postural stability [5, 16]. Such deficits may increase susceptibility to errors and injuries, particularly in physically demanding occupational settings or during high-intensity physical activity [27]. These findings are especially relevant for young adults balancing academic, occupational, and recreational physical demands.

Cardiovascular and metabolic functioning are likewise affected by sleep hygiene behaviors. Chronic sleep insufficiency has been associated with impaired glucose tolerance, increased inflammatory markers, autonomic imbalance, and reduced cardiovascular efficiency [11, 26]. Although these outcomes are often examined in older or clinical populations, evidence suggests that subclinical physiological alterations may already be detectable in young adulthood, particularly among individuals with persistently poor sleep hygiene [26].

Intervention studies reinforce the functional significance of sleep hygiene for physical performance. Behavioral and educational programs promoting consistent sleep timing, optimization of the sleep environment, and reduction of evening stimulatory behaviors have demonstrated improvements in subjective fatigue, recovery perception, and objective performance metrics [27, 28]. These interventions appear particularly effective when integrated with broader lifestyle modifications and cognitive-behavioral strategies targeting maladaptive sleep-related beliefs [30].

In summary, sleep hygiene represents a multidimensional determinant of physical performance in young adults. Poor adherence to sleep hygiene principles compromises recovery processes, neuromuscular efficiency, endocrine regulation, and metabolic stability. Conversely, promoting healthy sleep behaviors constitutes a modifiable and cost-effective strategy for enhancing physical capacity, reducing fatigue, and supporting long-term physiological health [26–28].

Methodological and Contextual Determinants of Sleep Hygiene in Young Adults

Understanding sleep hygiene in young adults requires consideration of methodological challenges and broader contextual influences. One of the primary limitations in the existing literature is the heterogeneity of sleep hygiene definitions and assessment tools, which complicates cross-study

comparisons and synthesis of findings [1, 33]. Sleep hygiene is frequently operationalized through self-report instruments focusing on maladaptive behaviors, potentially underrepresenting protective or health-promoting practices [33].

Self-report measures, while practical and widely used, are subject to recall bias, social desirability effects, and discrepancies between perceived and actual sleep behaviors [34]. Objective measures, such as actigraphy and polysomnography, provide valuable data on sleep timing, duration, and efficiency but do not directly assess sleep hygiene behaviors themselves [35, 36]. The lack of integrated assessment approaches combining behavioral, subjective, and objective indicators represents a significant methodological gap.

Conceptual overlap between sleep hygiene, sleep quality, and insomnia symptoms further complicates interpretation. In some studies, sleep hygiene behaviors are assessed concurrently with sleep outcomes, raising concerns about circular reasoning and inflated associations [30]. Clear differentiation between behaviors, intermediate sleep parameters, and clinical sleep disorders is essential for advancing theoretical clarity and causal inference.

Contextual determinants exert a profound influence on sleep hygiene adherence among young adults. Academic workload, irregular class schedules, examinations, and deadline-driven study patterns frequently promote delayed bedtimes and sleep restriction [19]. Many students and early-career professionals adopt compensatory sleep behaviors, such as weekend oversleeping, which exacerbate circadian misalignment and social jet lag [40].

Digital technology use represents a particularly salient contextual factor. Evening exposure to smartphones, computers, and social media platforms contributes to delayed sleep onset through both physiological mechanisms, such as melatonin suppression, and psychological mechanisms, including cognitive and emotional arousal [20, 21, 40]. These behaviors are deeply embedded in social norms, rendering behavioral modification challenging despite awareness of sleep hygiene principles.

Cultural attitudes toward sleep further shape sleep hygiene behaviors. Societal norms that valorize productivity, extended working hours, and constant availability often normalize chronic sleep restriction, particularly among high-achieving young adults [25]. Socioeconomic constraints, including employment during studies and unstable living conditions, may additionally limit opportunities to maintain consistent and restorative sleep routines [40].

These contextual influences help explain the frequent disconnect between sleep hygiene knowledge and actual behavioral adherence. Educational interventions alone may yield limited effects if structural and environmental barriers are not addressed [32]. Effective sleep hygiene promotion therefore requires multilevel strategies that integrate individual behavior change with institutional policies and cultural shifts that recognize sleep as a core component of health.

In summary, sleep hygiene in young adults is shaped by a complex interplay of behavioral, methodological, and contextual factors. Advancing research and intervention efforts necessitates standardized assessment tools, clearer conceptual frameworks, and context-sensitive approaches that account for academic, social, and cultural realities. Addressing these determinants is essential for translating sleep hygiene knowledge into sustainable behavioral change and meaningful improvements in functional outcomes [1–40].

SUMMARY AND CONCLUSIONS

This narrative review provides a comprehensive synthesis of current scientific evidence concerning the role of sleep hygiene in cognitive functioning, psychological well-being, and physical performance among young adults. The reviewed literature consistently indicates that sleep hygiene represents a fundamental and modifiable determinant of daytime functioning and overall health during early adulthood, a developmental period characterized by heightened cognitive demands, emotional vulnerability, and dynamic lifestyle patterns [1–5, 9, 19, 21].

Across cognitive domains, inadequate adherence to sleep hygiene principles is associated with impairments in attention, working memory, executive functioning, and learning efficiency [6–8, 17–20, 25–28]. These deficits manifest not only under conditions of acute sleep deprivation but also in the context of chronic, moderate disruptions in sleep-related behaviors, such as irregular sleep schedules, insufficient sleep duration, and circadian misalignment [3–5, 17, 20–23]. Everyday sleep hygiene practices exert cumulative effects on cognitive efficiency, with meaningful implications for academic performance, occupational functioning, and decision-making capacity [9, 26–28].

From a psychological perspective, the findings highlight a robust association between poor sleep hygiene and increased symptoms of depression, anxiety, emotional dysregulation, and heightened stress reactivity [7, 8, 12–15, 29–31, 32–34]. The relationship between sleep hygiene and mental health is bidirectional. Maladaptive sleep behaviors may contribute to the onset and maintenance of psychological distress, while mental health difficulties may, in turn, undermine adherence to healthy

sleep practices [31–34, 36]. Neurobiological mechanisms, including dysregulation of stress-response systems and impaired emotional regulation networks, appear to mediate these associations [35, 36].

Sleep hygiene also plays a critical role in physical performance and physiological functioning. Disrupted sleep-related behaviors compromise recovery processes, neuromuscular coordination, endocrine regulation, and metabolic stability [34, 39, 40]. Although much of the existing literature focuses on athletic populations, the relevance of sleep hygiene extends to the broader population of young adults engaged in physically or cognitively demanding activities [39, 40]. Even modest and chronic deviations from recommended sleep practices may lead to increased fatigue, reduced physical capacity, and impaired resilience [34, 39, 40].

A significant contribution of this review lies in its examination of methodological and contextual considerations shaping the interpretation of existing findings. The literature reveals substantial heterogeneity in the operationalization and assessment of sleep hygiene, with a predominance of self-report measures and cross-sectional designs [33–36]. Conceptual overlap between sleep hygiene behaviors, sleep quality, and insomnia symptoms further complicates causal inference [30, 33, 34]. Advancing the field will require standardized assessment tools, longitudinal study designs, and integrative approaches combining subjective behavioral measures with objective sleep parameters [35, 36].

Moreover, this review emphasizes that sleep hygiene behaviors in young adults are deeply embedded within social, academic, and cultural contexts. Academic workload, irregular schedules, digital technology use, socioeconomic constraints, and cultural norms that prioritize productivity over rest significantly influence the feasibility of maintaining healthy sleep practices [19, 25, 40]. These contextual factors help explain why knowledge of sleep hygiene principles does not consistently translate into sustained behavioral change and why individual-level educational interventions may yield limited effects when broader structural influences are not addressed [3, 19, 40].

Intervention studies reviewed herein suggest that sleep hygiene represents a cost-effective and modifiable target for improving sleep quality and functional outcomes in young adults [32, 40]. Educational and behavioral interventions have demonstrated beneficial effects on sleep parameters, cognitive performance, emotional well-being, and perceived recovery [30, 32, 40]. However, effectiveness is likely to be enhanced when interventions are context-sensitive and integrated within

institutional frameworks, such as educational settings and preventive healthcare programs [30, 32, 40].

In conclusion, sleep hygiene should be conceptualized as a multidimensional construct influenced by behavioral, physiological, methodological, and contextual factors [1–5, 7, 8, 12–15, 17–20, 25–36, 39, 40]. Promoting healthy sleep hygiene among young adults requires a comprehensive approach that extends beyond individual awareness to include supportive social environments, evidence-based assessment strategies, and institutional policies that facilitate regular and restorative sleep. Future research should prioritize standardized measurement, longitudinal analysis, and multilevel interventions to strengthen the evidence base and inform effective health promotion strategies aimed at optimizing cognitive performance, psychological well-being, and physical functioning during young adulthood [1–40].

DISCLOSURE

The authors declare that they have no relevant financial or non-financial interests to disclose.

AUTHOR CONTRIBUTION

Conceptualization: P.R.
Methodology: P.R., M.K.
Literature search: P.R., K.K., J.B., B.G., K.Kl.
Validation: P.R., K.K., J.B.
Formal analysis: P.R.
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Not applicable. This study is a narrative review and did not involve human participants or animals.

INFORMED CONSENT STATEMENT

Not applicable. No human participants were involved in this study.

DATA AVAILABILITY STATEMENT

No new data were created or analyzed in this research. Data sharing is therefore not applicable.

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Not applicable.

CONFLICT OF INTEREST STATEMENT

The author declares no conflicts of interest.

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