

THE CONNECTION BETWEEN SLEEP QUALITY, MENTAL HEALTH, AND
COGNITIVE FUNCTIONS IN YOUNG ADULTS:

A LITERATURE REVIEW

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Abstract

Background: Sleep is essential for the normal functioning of the body, emotional well-being, and cognitive performance. Sleep problems are common among university students and may be related to high academic demands, stress, and irregular daily routines. Insufficient sleep can affect mood, attention, and the ability to learn and retain new information.

Objective: To review the scientific literature on the relationship between sleep quality, mental health, and cognitive functions in young adults.

Methods: A literature review was conducted on sleep patterns and sleep problems among university students and other young adults. The review focused on studies examining the associations between sleep and anxiety, depressive symptoms, memory, and attention, as well as studies evaluating interventions to improve sleep. Particular attention was given to systematic reviews and meta-analyses.

Results: The reviewed literature indicates that insufficient sleep may impair attention, slow reaction time, and negatively affect certain aspects of memory. Sleep problems are also associated with symptoms of anxiety and depression. Emotional stress may interfere with falling asleep, while insufficient sleep may further worsen psychological well-being.

Psychological interventions, particularly cognitive behavioral therapy for insomnia, have been shown to improve sleep.

Conclusion: Sleep quality is an important factor in maintaining mental health and cognitive performance in young adults. For university students, maintaining a regular sleep schedule and avoiding persistent sleep restriction due to academic demands are particularly important. Individuals experiencing persistent sleep problems should seek professional advice. Further research is needed to better understand the relationship between sleep, mental health, and cognitive functions.

Keywords: sleep, sleep quality, young adults, university students, mental health, anxiety, depression, cognitive functions, memory, attention.

Introduction

Sleep is an essential part of human life. It supports the body's recovery, the normal functioning of the nervous system, and emotional well-being. During sleep, the brain processes and consolidates information acquired throughout the day. Therefore, adequate sleep plays an important role in attention, learning, and the performance of cognitive tasks.

Sleep assessment involves more than measuring the number of hours spent sleeping. Other important aspects include the time required to fall asleep, the frequency of nighttime awakenings, the regularity of sleep patterns, and the feeling of being rested upon waking.

University students may experience sleep difficulties for various reasons. Exam preparation, a heavy academic workload, concerns about academic performance, and using mobile phones before bedtime may lead to later bedtimes. When this pattern becomes habitual, it can negatively affect daily functioning and overall well-being.

The widespread nature of this problem is demonstrated by a systematic review and meta-analysis published by Spyridonidis and colleagues in 2025. The review included 48 studies involving a total of 95,938 university students. The pooled prevalence of insomnia symptoms was 46.9% (95% confidence interval: 40.1–53.6%) [1]. However, the estimates varied considerably across studies, so this figure should not be assumed to apply equally to all student populations.

Insufficient sleep may be associated not only with fatigue but also with changes in emotional state and cognitive performance. For example, anxious thoughts may interfere with falling asleep, while sleep deprivation may make it more difficult to concentrate during classes and regulate emotions [2, 3].

The causes of these changes are not always easy to identify. Stress, health conditions, daily habits, and living circumstances may affect both sleep and mental health. Therefore, the relationship between these factors should be considered in a broader context.

The aim of this paper is to review and summarize the scientific literature on the relationship between sleep quality, mental health, and cognitive functions in young adults.

Materials and Methods

Scientific publications on sleep quality and sleep problems among university students and young adults were reviewed. The main topics included the prevalence of insomnia symptoms, their association with mental health, the effects of insufficient sleep on memory and attention, and approaches to improving sleep.

Priority was given to systematic reviews and meta-analyses published in scientific journals.

The main findings, characteristics of the study populations, and limitations affecting the interpretation of the results were considered.

This paper is a narrative literature review and was not conducted according to a complete systematic review protocol.

Results and Discussion

1. Prevalence of Sleep Problems Among University Students

Sleep problems may include difficulty falling asleep, frequent nighttime awakenings, or feeling unrefreshed after waking. Some individuals experience these difficulties occasionally, particularly during examination periods. In others, sleep problems may persist for weeks or months and interfere with everyday activities.

It is important to distinguish occasional sleep difficulties from clinical insomnia. A diagnosis requires consideration of the duration and severity of symptoms and their impact on daily functioning.

In the meta-analysis by Spyridonidis and colleagues, the pooled prevalence of insomnia symptoms among university students was 46.9% [1]. This finding suggests that sleep-related complaints are common in this population.

Possible contributing factors include a heavy academic workload, psychological stress, irregular daily routines, and insufficient time for rest. For example, completing assignments late at night while having to attend early morning classes may lead to a persistent reduction in sleep duration.

If this pattern continues, students may experience daytime sleepiness, reduced concentration, and poorer overall well-being. In such cases, it is important to review daily habits and, when necessary, consult a healthcare professional to identify possible underlying causes.

2. Sleep Quality and Mental Health

Sleep and mental health are closely related. People experiencing anxiety may find it difficult to relax in the evening because they continue to worry about problems, anticipate stressful events, or think repeatedly about unpleasant experiences. Depression may also be associated with sleep disturbances, including insomnia, frequent nighttime awakenings, or increased sleep duration.

In a systematic review and meta-analysis, Chandler and colleagues examined interventions aimed at improving sleep and mental health among university students. Six studies were included in the quantitative analysis. The authors found that psychological interventions reduced sleep problems and were also associated with some improvement in anxiety and depressive symptoms [2].

These findings suggest that interventions targeting sleep may also have beneficial effects on psychological well-being. However, the effectiveness of these approaches may vary between individuals. Furthermore, sleep interventions should not be considered a substitute for appropriate treatment in people with diagnosed mental health disorders.

The relationship between sleep and mental health may be bidirectional. Psychological stress can interfere with sleep, while insufficient sleep may contribute to irritability, fatigue, and difficulties with concentration.

As a result, students may find it more difficult to manage academic demands and everyday responsibilities.

Other factors that may influence both sleep and mental health should also be considered.

These include academic conditions, physical health, lifestyle habits, and personal circumstances.

Therefore, sleep patterns should be considered when assessing the mental health of young adults. However, sleep problems alone are not sufficient to establish a diagnosis of an anxiety or depressive disorder; further clinical assessment may be necessary.

3. Effects of Insufficient Sleep on Cognitive Functions

Successful learning requires the ability to retain information, sustain attention, and process new material efficiently. These abilities are part of cognitive functioning and may be affected by insufficient sleep.

Following a short or poor-quality night's sleep, individuals may find it more difficult to maintain concentration over extended periods. Reaction time may also increase, and the likelihood of errors may rise. These changes are particularly relevant when performing tasks that require sustained attention and accuracy.

Griggs and colleagues conducted a systematic review of 19 randomized controlled trials involving 766 young adults. Their findings indicated that sleep deprivation negatively affected neurobehavioral functioning, particularly psychomotor vigilance. Increased daytime sleepiness and changes in emotional state were also reported [3].

Similarly, a meta-analytic review by Lowe and colleagues, which included 61 studies, found that sleep restriction was associated with impairments in several cognitive domains, including sustained attention, executive functions, and long-term memory [4].

These findings are particularly relevant to students who may reduce their sleep time during examination periods to spend more hours studying. However, insufficient sleep can make it more difficult to concentrate and learn new material. Therefore, spending additional time studying does not necessarily lead to better academic performance.

It is important to distinguish between total sleep deprivation and partial sleep restriction, as these conditions may have different effects on cognitive performance. The extent of impairment may also depend on individual characteristics and the conditions under which sleep and cognition are assessed.

Adequate sleep should therefore be considered an important factor in maintaining attention, memory, and overall cognitive performance.

4. Approaches to Improving Sleep Quality

Given the prevalence of sleep problems among university students, preventive measures are important. One practical approach is to maintain a regular sleep schedule. Going to bed and waking up at approximately the same time each day, as well as planning academic activities effectively, may help students avoid repeatedly sacrificing sleep for studying.

However, changes in daily habits may not be sufficient for everyone. Individuals who experience persistent difficulty falling asleep or frequent nighttime awakenings may require additional support.

In a systematic review and meta-analysis, Tadros and colleagues examined 22 studies evaluating psychological interventions to improve sleep among university students aged 18–30 years. The findings indicated that these interventions improved sleep quality compared with control conditions. Cognitive behavioral therapy for insomnia showed more pronounced effects than mindfulness-based interventions. However, the authors emphasized that further research is needed to establish the differences in effectiveness between these approaches [5].

Cognitive behavioral therapy for insomnia focuses on changing behaviors and thought patterns that contribute to persistent sleep difficulties. It is an established psychological approach for managing ongoing problems with falling asleep and staying asleep.

The choice of intervention depends on the nature and duration of symptoms and their impact on daily functioning. Individuals experiencing persistent sleep problems, excessive daytime sleepiness, or reduced performance should consider consulting a healthcare professional.

Education about the importance of sleep for health and learning is also valuable.

Universities may organize educational activities to raise awareness of healthy sleep habits, the consequences of sleep deprivation, and the signs that indicate a need for professional assessment.

Limitations of the Review

Several limitations should be considered when interpreting the findings.

First, the literature search was not conducted according to a complete systematic review protocol. Therefore, some relevant publications may not have been included.

Second, the included studies differed in participant characteristics, methods of sleep assessment, and study conditions. These differences limit the direct comparability of their findings.

Third, an association between two variables does not necessarily establish a causal relationship. For example, sleep problems may be associated with anxiety, but additional factors must be considered to determine the direction and nature of this relationship.

Finally, academic conditions, lifestyle habits, and social environments vary across countries and educational institutions. Consequently, the findings may not be equally applicable to all groups of young adults.

Conclusion

The reviewed literature indicates that sleep quality is associated with mental health and cognitive functioning in young adults. Insufficient sleep may be accompanied by reduced attention, slower reaction time, and impairments in certain aspects of memory. Sleep problems are also frequently associated with symptoms of anxiety and depression.

This relationship may be bidirectional: psychological difficulties can interfere with sleep, while insufficient sleep may negatively affect mood and the ability to cope with stress.

This issue is particularly important for university students because academic performance requires sustained attention and the ability to process and retain large amounts of information. Maintaining a regular sleep schedule and obtaining sufficient sleep may help support cognitive performance and overall well-being. For persistent sleep difficulties, psychological interventions, including cognitive behavioral therapy for insomnia, may be beneficial.

Overall, sleep should be regarded as an important component of young adults' health, alongside physical activity, nutrition, and other lifestyle factors. Further research is needed to better understand the relationship between sleep, mental health, and cognitive functions.

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