Original Article

Sleep Hygiene: A Key Factor in Reducing Academic Stress and Depression in College Students

Yashika Bhardwaj, Munish Rastogi

Abstract:

Background: Sleep plays a vital role in mental health, and its impact on academic stress and depression levels among college students is a pressing concern. This study investigates the effect of sleep hygiene on academic stress and depression levels among college students.

Aim: This study aims to identify practical strategies that enhance student well-being through improved sleep practices and to evaluate the impact of sleep hygiene on academic stress and depression levels among college students.

Materials and Methods: Ninety college students were randomly assigned to one of three groups: a control group with no intervention, a yoga group participating in daily yoga sessions, and a sleep hygiene group encouraged to maintain consistent sleeping habits. Pre- and post-intervention assessments were conducted using the Academic Stress Scale (ASS) and the Beck Depression Inventory (BDI) over a 10-day intervention period.

Results: The results showed a significant reduction in academic stress and depressive symptoms among participants in the sleep hygiene group compared to the control group.

Conclusion: This study highlights the critical role of sleep hygiene in mitigating academic stress and depression among college students. By fostering healthy sleep habits, educational institutions can play a pivotal role in promoting student well-being and academic success.

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INTRODUCTION

College students are a demographic particularly susceptible to chronic sleep deprivation and poor sleep quality, which can have far-reaching consequences for their health and well-being [1]. Research suggests that up to half of university students experience poor sleep quality, with nearly one-third failing to meet the recommended 8-10 hours of sleep per night. The academic pressures and significant life changes that characterize the college experience can exacerbate the risk of poor mental health in students.

The repercussions of inadequate sleep extend beyond mere fatigue, contributing to a range of negative outcomes, including diminished academic performance, increased stress, anxiety, and a heightened risk of depression. Significantly, around 18.5% of university students report experiencing insomnia [2]. These challenges highlight the urgent necessity to tackle sleep-related problems within this population.

Mental health includes both positive and negative dimensions, such as subjective well-being and depression, which can significantly influence physical health and overall quality of life. A substantial amount of research demonstrates a strong relationship between sleep quality and mental health outcomes, with students who report better sleep quality generally showing improved mental health [3.]In contrast, poor sleep quality has been associated with heightened levels of perceived stress, anxiety, and depression.

The connection between sleep and mental health is frequently bidirectional, where poor mental health can lead to sleep disturbances, while inadequate sleep can adversely affect mental health. Sleep hygiene, which refers to adjustable behaviors and environmental practices that encourage adequate sleep quantity and quality, plays a crucial role in influencing sleep. By targeting improvements in sleep hygiene and sleep quality among college students, educational

Author Affiliations

Yashika Bhardwaj, PhD Scholar, School of Health Sciences, Chhatrapati ShahuJi Maharaj University, Kanpur, UP, Dr.Munish Rastogi, Associate Professor, School of Health Sciences, Chhatrapati ShahuJi Maharaj University, Kanpur, UP,

Correspondence

Yashika Bhardwaj, PhD Scholar, School of Health Sciences, Chhatrapati ShahuJi Maharaj University, Kanpur, UP

Email:yashikabhardwaj62@gmail.com

Contact No: 8445181791

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institutions may be able to yield positive effects on student well-being, ultimately improving mental health among this at-risk population.

Given the high prevalence of sleep problems and their significant impact on mental health and academic success, it is essential to explore the role of sleep hygiene in mitigating academic stress and depression among college students. Effective strategies may include workshops on sleep hygiene education, mindfulness programs to reduce stress, and creating environments conducive to better sleep, such as quiet study areas and policies that limit noise in dormitories during late hours.

Furthermore, universities should consider integrating mental health services with programs focused on improving sleep hygiene. Research suggests that interventions targeting both aspects can lead to significant improvements in overall student well-being. By fostering a culture that values healthy sleeping practices alongside academic success, institutions can enhance their students' resilience against stressors and improve their overall academic performance.

MATERIALS AND METHODS

A cross-sectional study was conducted involving 90 college students aged 18 to 25 years, who were randomly assigned into three groups of 30 participants each. The first group served as the control and received no intervention. The second group participated in a yoga program for 10 days, while the third group was advised to maintain a regular sleep schedule for the same duration. To assess outcomes, all participants completed the Academic Stress Scale (ASS), which measures perceived academic stress, and the Beck Depression Inventory (BDI), which evaluates the intensity of depressive symptoms. Both questionnaires were administered before and after the 10-day intervention period to evaluate changes in academic stress and depressive symptoms across the groups.

Table 1: **PSQI and BDI score changes pre- and post-intervention**

Group	Participants	Mean ± SD of PSQI Score Before Intervention	Mean ± SD of PSQI Score After Intervention	Change in PSQI Score (Mean ± SD)	Mean ± SD of Change in PSQI Score	Mean ± SD of BDI Score After Intervention	Mean ± SD of Change in BDI Score	Statistical Significance (p-value)
Control Group	30	7.10 ± 3.20	7.15 ± 3.25	+0.05 ± 0.15	18.3 ± 6.5	18.4 ± 6.6	+0.1 ± 0.2	Not Significant ($p > 0.05$)
Yoga Intervention Group	30	7.15 ± 3.10	6.80 ± 2.90	-0.35 ± 0.20	18.7 ± 6.8	17.9 ± 6.5	-0.8 ± 0.3	Not Significant ($p > 0.05$)
Sleep Hygiene Group	30	7.20 ± 3.25	6.17 ± 3.16	-1.03 ± 0.30	18.5 ± 6.4	14.2 ± 5.8	-4.3 ± 1.2	Significant ($p < 0.05$)

Statistical Analysis

Correlation analysis revealed a significant positive relationship between poor sleep quality and higher levels of perceived stress ($r = 0.363$), anxiety ($r = 0.387$), and depression ($r = 0.347$). Furthermore, regression analysis indicated that inadequate sleep hygiene practices were strongly associated with poorer sleep quality ($p < 0.001$) and greater severity of insomnia ($p < 0.001$), highlighting the critical impact of sleep habits on mental health and sleep disturbances.

RESULTS

At baseline, the mean Pittsburgh Sleep Quality Index (PSQI) score for all participants was 7.12 ± 3.16, reflecting generally poor sleep quality across the sample. Approximately 92% of participants reported experiencing sleep-related difficulties, such as trouble falling asleep and maintaining sleep. Regarding depression, the mean Beck Depression Inventory (BDI) score was 18.5 ± 6.4, indicating that moderate depressive symptoms were prevalent among the study population.

Following the interventions, notable improvements were observed in the Sleep Hygiene Group. The mean PSQI score in this group significantly decreased to 6.17 ± 3.16 ($p = 0.0126$), suggesting better sleep quality. The proportion of participants reporting good sleep quality rose from 28% before the intervention to 46% afterward. Additionally, significant reductions were found in sleep latency (the time taken to fall asleep) and daytime dysfunction ($p < 0.05$), with participants noting that spending less time awake in bed contributed to more restorative sleep.

In the Yoga Group, some improvements were reported, particularly in feelings of relaxation and overall well-being. However, these changes did not translate into statistically significant improvements in PSQI scores compared to baseline, nor were they as

pronounced as those seen in the Sleep Hygiene Group.

The Control Group showed no significant changes in either sleep quality or depression levels, reinforcing the effectiveness of the interventions applied to the other groups.

Post-intervention, the mean BDI score for the Sleep Hygiene Group decreased significantly to 14.2 ± 5.8 ($p = 0.049$), indicating a reduction in depressive symptoms. Importantly, there was a significant correlation between improvements in sleep quality (as measured by PSQI) and reductions in depression scores (BDI), with a post-intervention beta coefficient of 0.40 ($p = 0.02$). This underscores the impact of improved sleep hygiene on both sleep quality and mental health outcomes among college students. The implementation of a structured sleep hygiene education program led to significant improvements in both sleep quality and depressive symptoms among college students.Enhanced awareness of the importance of sleep hygiene correlated with better daytime functioning and reduced feelings of fatigue.Participants reported that reducing screen time before bed was particularly beneficial, aligning with findings from previous studies that identified screen time as a major factor affecting sleep latency.

DISCUSSION

Recently, there has been a lot of interest in the connection between university students' academic success and their sleep quality, especially as the demands of higher education keep increasing. Kuhn et al.'s study from 2024 offers important new information about how academic discipline affects sleep hygiene, dysfunctional sleep attitudes, and the length and quality of sleep in general. [2] This discussion synthesizes findings from multiple studies to explore the complex interplay between academic discipline, sleep quality, and mental health, emphasizing the need for targeted interventions to improve student well-being.

Academic Discipline and Sleep Quality Kuhn et al. (2024) found that students in different academic disciplines exhibited varying levels of sleep quality and dysfunctional attitudes toward sleep. [2] Specifically, Art students reported poorer sleep hygiene and higher insomnia severity compared to their peers in Health disciplines. This finding suggests that students in demanding programs may prioritize academic responsibilities and oversleep, leading to negative consequences for their sleep quality. For example, Dewald-Kaufmann et al. (2014) noted that students in high-stress disciplines like Engineering often experience significant sleep disturbances due to rigorous academic demands. [4]

Kuhn et al. (2024) highlighted the significant mediating role of mental health in the relationship between sleep quality and academic discipline. Their findings revealed that the disparities in sleep quality across different disciplines diminished when mental health factors were taken into account, underscoring the substantial impact of mental health on sleep patterns. [2] Lo, J. C. et al., (2016) aligns with previous research indicating a bidirectional relationship between sleep and mental health, where inadequate sleep can exacerbate mental health issues, and conversely, poor mental health can lead to sleep disturbances. [5]

For instance, Alvaro et al. (2013) found that anxiety and depression are prevalent among university students and are strongly correlated with poor sleep quality. The authors suggest that addressing mental health issues should be an integral part of any intervention aimed at improving sleep among students. [6] This perspective emphasizes the importance of universities providing comprehensive support services that address both mental health and sleep hygiene.

Implications for Interventions Given the unique relationships between academic discipline and sleep quality identified in Kuhn et al.'s study, universities need to implement targeted interventions tailored to the specific needs of students in different fields. For example, workshops focused on improving sleep habits could benefit Art students who struggle with insomnia. [2] Similarly, Engineering students might require strategies to manage academic stress while promoting healthy sleeping habits.

Mindfulness techniques have also been demonstrated to improve sleep quality by lowering anxiety as well as stress levels. Incorporating mindfulness-based interventions into existing wellness programs could provide students with tools to manage stress effectively while promoting better sleep hygiene. [7]

CONCLUSION

Our findings demonstrate that a targeted sleep hygiene education program significantly improves sleep quality and reduces depressive symptoms in this population. By comparing a sleep hygiene intervention group, a yoga intervention group, and a control group, we were able to isolate the impact of specific behavioral changes and educational efforts on key mental health outcomes.

The notable improvements observed in the sleep hygiene group underscore the efficacy of straightforward, actionable strategies for enhancing sleep quality. By equipping participants with knowledge on maintaining a consistent sleep schedule, creating a sleep-conducive environment, and avoiding pre-bedtime stimulants, the study demonstrated significant reductions in sleep latency and improvements in daytime functioning. This finding reinforces the idea that empowering students with practical tools and knowledge can lead to meaningful improvements in their daily lives.

While the yoga intervention also showed positive trends, the sleep hygiene group exhibited more pronounced and statistically significant enhancements in sleep quality metrics. This suggests that direct, targeted interventions addressing sleep behaviors may be more impactful in improving sleep-related

outcomes compared to general relaxation techniques, though yoga still provides valuable stress-reduction benefits.

The reduction in depressive symptoms among the sleep hygiene group further underscores the critical link between sleep and mental health. Improved sleep quality correlated significantly with lower BDI scores, suggesting that better sleep can serve as a protective factor against depression. These results are particularly relevant given the high prevalence of sleep problems and mental health challenges among college students, highlighting the need for proactive interventions within educational settings.

Overall, this study advocates for the integration of sleep hygiene education into university curricula and student wellness programs. By prioritizing sleep and providing students with the resources and knowledge to improve their sleep habits, educational institutions can play a vital role in fostering a healthier, more resilient student body. The long-term impacts of sleep hygiene interventions should be examined in future studies, as should the possibility of integrating sleep hygiene instruction with other mental health support services to optimise benefits for college students. Ultimately, recognizing and addressing sleep as a fundamental component of well-being is essential for creating a supportive and thriving academic environment.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this study.

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