International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

A Prospective Interventional Study on Sleep Hygiene: Mitigating Sleep Deprivation and Its Impact on Youth Health

Ashisha Sam Jacob [1], Angelin Susan Varghese[2], Royce An Abraham[3], Dr. Phillip Jacob[4]

[1,2,3]Pharm D interns, Nazareth College of Pharmacy, Othera, Thiruvalla
[4]HOD, Professor, Department of Pharmacy Practice, Nazareth College of Pharmacy, Othera, Thiruvalla

ABSTRACT:
This study investigates the impact of sleep deprivation on the academic performance, mental health, and physical health of students aged 15 to 24. It also evaluates the effectiveness of an educational intervention designed to promote better sleep hygiene. For six months, 750 students from various high schools, colleges, and universities participated in this prospective interventional study. Participants completed questionnaires assessing their health outcomes, academic achievement, and sleep quality both before and after the intervention. An instructional session on proper sleep hygiene was conducted, and the results were analyzed. Forty-seven percent of participants reported that sleep deprivation negatively affected their academic performance, with the areas most impacted being memory, focus, and mood. Additionally, 38.27 percent of the participants experienced physical health issues, such as exhaustion and compromised immunity. After the intervention, academic performance improved by 15%, and awareness and adoption of good sleep hygiene practices increased by 25%. Inadequate sleep significantly affects the physical, mental, and emotional well-being of young people. By encouraging better sleep habits, educational interventions can help mitigate these negative effects and enhance both academic performance and overall well-being.

Keywords: mental health, academic performance, sleep hygiene

INTRODUCTION:

Sleep is a crucial factor in determining health and well-being, especially during adolescence and early adulthood when individuals face various social, emotional, and academic pressures. Contemporary lifestyle factors, such as excessive screen time, academic stress, and a cultural emphasis on productivity over leisure, have contributed to a decline in sleep quality among young people. Research has shown the negative consequences of sleep deprivation; however, few interventions aimed at improving sleep hygiene for youth have been implemented or evaluated for effectiveness.

Lack of sleep impairs essential cognitive functions such as memory, focus, and judgment, which are vital for effective learning and often result in poorer academic performance. Insufficient sleep can also lower Grade Point Average (GPA) in academic settings, significantly impacting the overall quality of life (QOL).

Additionally, the connection between inadequate sleep and risky behaviors—such as substance abuse, careless driving, and impulsive decisions—highlights the broader effects of sleep on safety and well-being. For overall health, sleep disturbances, particularly those affecting Rapid Eye Movement (REM) and Non-Rapid Eye Movement (NREM), are critical. It is increasingly clear that sleep deprivation not only negatively impacts physical health by decreasing immune function and increasing the risk of chronic diseases like obesity and cardiovascular issues, but also exacerbates emotional challenges, including stress and mood swings.

This study aims to address this knowledge gap by analyzing the impacts of sleep deprivation on quality of life, health, and academic performance. It will also evaluate the effectiveness of an educational intervention designed to promote better sleep hygiene practices.

OBJECTIVES: To evaluate the effects of inadequate sleep on young people

MATERIALS & METHODS:

Study Design: A community based prospective interventional study

Study Duration: The study was conducted for a period of 6 months (Nov 2023- April 2024)

Study Size: The study involved 750 students, i.e. 150 each from 5 streams (High school, Arts & Science, Engineering, Pharmacy, and Nursing)

Sample size = $1 + \frac{z^2 (pq)}{e^2}$

n = sample size

z = standard error associated with the chosen level of confidence

p = standard deviation/variability

q = 1-p

e = Acceptable sample error

A total of 750 students were enrolled in the study, representing five academic streams: High School, Arts and Science, Engineering, Pharmacy, and Nursing. Participants were selected based on the following criteria:

Inclusion Criteria: Students aged 15 to 24 years who provided informed consent and were willing to participate.

Exclusion Criteria: Students outside the specified age range, shift workers, those unwilling to participate, individuals with incomplete responses, and pregnant or lactating females.

Study Source: All relevant and necessary data were collected using a pre-designed data collection form from school and college students.

Study Materials: The materials used in this study included a pre-designed questionnaire.

Study Procedure: Data were collected through a validated questionnaire that focused on sleep patterns, academic performance, and health outcomes. The reliability and validity of the questionnaire were confirmed through pilot testing with a subset of students. Informed consent was obtained from both the participants and their institutions. An educational intervention on sleep hygiene was delivered through a structured PowerPoint presentation, which included practical strategies such as reducing screen time and maintaining consistent sleep schedules. Post-intervention questionnaires assessed changes in participants' knowledge and behaviors related to sleep.

Data Analysis: Data were entered into Microsoft Excel 2019 and analyzed using descriptive and inferential statistics. Results were presented as frequencies, percentages, and confidence intervals. Statistical significance was evaluated at a p-value of less than 0.05

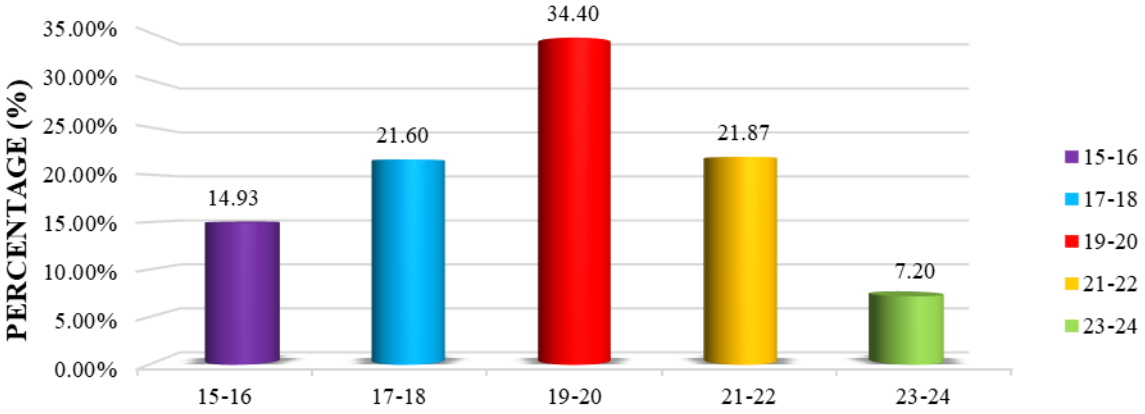
OBSERVATION AND RESULTS:

The study assessed the impact of poor sleep among youth aged 15 to 24 through an interventional study in schools and colleges involving 750 students, mainly aged 19 to 20 (34.4%). About 40.67% reported that sleep deprivation negatively affected their academic performance, especially in memory and focus, with high school and engineering students most affected. Additionally, 38.27% experienced health issues like fatigue, particularly among nursing and pharmacy students. After the intervention, awareness of healthy sleep practices increased by 25%, adherence rose by 20%, and 40% reported improved sleep quality, resulting in less fatigue and better concentration.

TABLE 1: PARTICIPANT DEMOGRAPHICS BY AGE GROUP

SL. NO.	AGE GROUP	FREQUENCY	PERCENTAGE
1	15-16	112	14.93
2	17-18	162	21.60
3	19-20	258	34.40
4	21-22	164	21.87
5	23-24	54	7.20
	TOTAL	750	100.00

FIGURE 1: DISTRIBUTION OF AGE GROUP



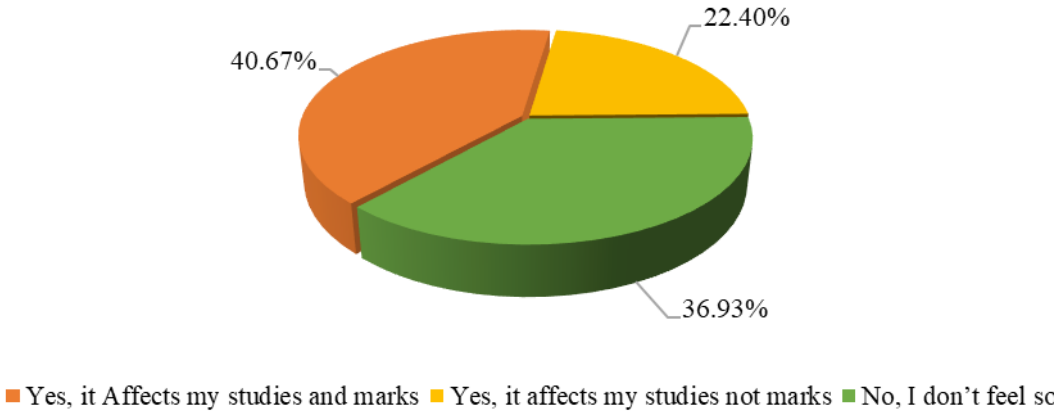
The graph indicates that among 750 participants, the response rate for the 19-20 age group was the highest at 34.40%

TABLE 2: IMPACT OF SLEEP DEPRIVATION ON ACADEMIC PERFORMANCE

SL. NO.	OPTIONS/COURSES	Yes, it affects my studies and marks	Yes, it affects my studies, not my marks	No, I don't feel so
1	HIGH SCHOOL	64	30	56
2	ARTS & SCIENCE	72	31	47

3	ENGINEERING	66	37	47
4	PHARMACY	49	40	61
5	NURSING	54	30	66
	FREQUENCY	305	168	277
	PERCENTAGE	40.67	22.40	36.93

FIGURE 2: DISTRIBUTION OF SLEEP IMPACT ON ACADEMICS

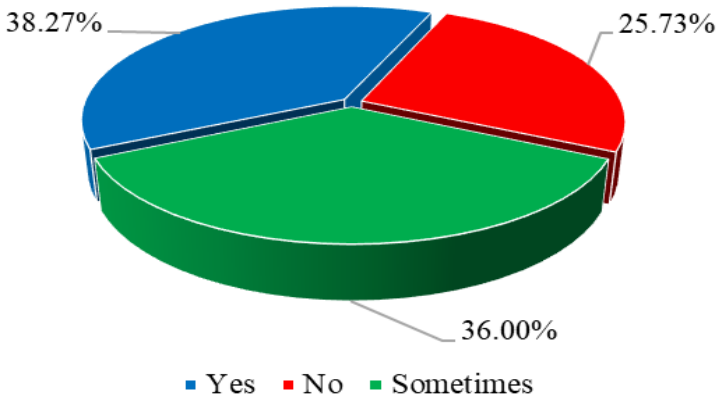


Of the total student population, 40.67% reported that poor sleep negatively affected their studies.

TABLE 3: IMPACT OF SLEEP DEPRIVATION ON IMMUNITY & HEALTH

SL. NO.	OPTIONS/COURSES	YES	NO	SOMETIMES
1	HIGH SCHOOL	38	43	69
2	ARTS & SCIENCE	63	36	51
3	ENGINEERING	64	39	47
4	PHARMACY	63	31	56
5	NURSING	59	44	47
	FREQUENCY	287	193	270
	PERCENTAGE	38.27	25.73	36.00

FIGURE 3: DISTRIBUTION OF THE IMPACT OF SLEEP ON IMMUNITY & HEALTH



A total of 38.27% of students reported that inadequate sleep impacted their health

DISCUSSION:

The findings of this study highlight the negative effects of sleep deprivation on youth, impacting academic, emotional, and physical well-being. Cognitive impairments, such as memory loss and difficulty concentrating, align with previous research that links insufficient sleep to decreased academic performance and productivity. Comparisons with earlier interventions emphasize the effectiveness of targeted educational programs in improving sleep hygiene. Physical health consequences, including fatigue and weakened immunity, also correspond with studies that associate poor sleep quality with a higher susceptibility to illnesses. Additionally, the emotional toll of sleep deprivation—manifested through stress, anxiety, and mood swings—highlights the urgent need for interventions focused on improving sleep hygiene among young people.

The educational intervention showed success in enhancing participants' understanding of the importance of sleep and encouraging behavioral changes. This supports existing literature that recognizes the role of education in addressing sleep-related issues. However, relying on self-reported data may introduce bias, so future research should include objective measures such as actigraphy or polysomnography to validate these findings.

Limitations: The study's dependence on self-reported data may have led to recall and social desirability biases. Additionally, the short duration of the intervention restricts the ability to assess long-term effects. Future studies should involve diverse populations and examine the sustainability of the resulting behavioral changes.

CONCLUSION:

This study highlights the significant effects of sleep deprivation on academic performance and overall well-being in youth. Educational interventions can be an effective way to address this public health issue by promoting healthier sleep habits and improving quality of life. Advocating for institutional policies that support sleep education is recommended to maintain these benefits. Future Directions: Longitudinal studies are necessary to assess the long-term sustainability of these interventions. It is essential for educators, policymakers, and healthcare professionals to collaborate in prioritizing sleep as a fundamental aspect of youth development.

REFERENCES:

1. Demirdiş B, Demirdiş S. Unravelling the Nexus: Cyberbullying, Sleep Quality, and Sleep-Related Impairments on Digital Platforms Among Young Adults. Int J Soc Inquiry. 2024;17(2):177-195. Doi:10.37093/ijsi.1460112.
2. Drescher AA, Goodwin JL, Silva GE, et al. Caffeine and Screen Time in Adolescence: Associations with Short Sleep and Obesity. J Clin Sleep Med. 2011;7(4):337-342. Doi:10.5664/jcsm.1182.
3. Becker SP, Sidol CA, Van Dyk T, Epstein JN. Predicting academic achievement and grade retention with ADHD symptom dimensions. J Clin Child Adolesc Psychol. 2017;46(5):1–14. Doi:10.1080/15374416.2016.1144199.
4. Gradisar M, Gardner G, Dohnt H. Recent worldwide trends in adolescent sleep duration: Insights from intervention studies. J Adolesc Health. 2011;48(6):548–56. Doi:10.1016/j.jadohealth.2010.09.023.

5. Carter B, Rees P, Hale L, Bhattacharjee D, Paradkar MS. Association between portable screen-based media device access or use and sleep outcomes: A systematic review and meta-analysis. JAMA Pediatr. 2016;170(12):1202–1208. Doi:10.1001/jamapediatrics.2016.2341.
6. Robbins R, Piazza A, Martin RJ, Jean-Louis G, Knowlden AP, Grandner MA. Examining the relationship between poor sleep health and risky driving behaviors among college students. Traffic Injury Prevention. 2021 Oct 26;22(8):599–604
7. Yeo SC, Tan J, Lo JC, Chee MW, Gooley JJ. Associations of time spent on homework or studying with nocturnal sleep behaviour and depression symptoms in adolescents from Singapore. Sleep Health. 2020 Dec 1;6(6):758-66.
8. Zafar M, Musa Omer EO, Hassan ME, Ansari K. Association of sleep disorder with academic performance among medical students in Sudan. Russian Open Medical Journal. 2020 Jun 30;9(2).
9. Arbinaga F, Fernández-Cuenca S, Fernández-Ozcorta EJ, Toscano-Hermoso MD, Joaquin-Mingorance M. Level of physical activity and sleep characteristics in university students. Sleep Science. 2019 Oct;12(4):265.
10. B. Sygaco KP. The Correlation of Sleep and Academic Performance. Asian Journal of Interdisciplinary Research. 2021 Feb 13;47–57.
11. Kamaruzihan M, Soe amp; A comparative study: Impact of screen time on sleep quality among university students and school children. Journal of Pharmacy. 2023;3(1):75–85
12. Chung N, Bin YS, Cistulli PA, Chow CM. Does the proximity of meals to bedtime influence the sleep of young adults? A cross-sectional survey of university students. International journal of environmental research and public health. 2020 Apr;17(8):2677.
13. Kim J, Noh JW, Kim A, Kwon YD. The impact of weekday-to-weekend sleep differences on health outcomes among adolescent students. Children. 2022 Jan 3;9(1):52.
14. Ozdemir PG, Karadag AS, Selvi Y, Boysan M, Bilgili SG, Aydin A, Onder S. Assessment of the effects of antihistamine drugs on mood, sleep quality, sleepiness, and dream anxiety. International journal of psychiatry in clinical practice. 2014 Aug 1;18(3):161-8.
15. Ye L, Hutton Johnson S, Keane K, Manasia M, Gregas M. Napping in College Students and Its Relationship With Nighttime Sleep. Journal of American College Health. 2015 Jan 14;63(2):88–97.