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Relationship between Physical Activity Levels and Sleep Quality in College Students

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Abstract

Purpose: The aim of the study was to assess the relationship between physical activity levels and sleep quality in college students.

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The study showed that students who engage in regular physical activity tend to experience better sleep quality compared to their less active peers. Regular exercise appears to enhance various aspects of sleep, including sleep duration, sleep onset latency (the time it takes to fall asleep), and sleep efficiency (the percentage of time spent asleep while in bed). Additionally, physically active students often report fewer sleep disturbances and improved overall restfulness. The type and intensity of physical activity also play crucial roles. Moderate to vigorous physical activities, such as aerobic exercises and strength training, have been particularly effective in promoting better sleep quality. These activities help regulate circadian rhythms, reduce symptoms of anxiety and depression, and alleviate stress, all of which contribute to more restful and uninterrupted sleep. Conversely, a lack of physical activity is associated with poorer sleep outcomes. Sedentary behavior, common among college students due to academic pressures and lifestyle choices, can lead to sleep problems such as insomnia and excessive daytime sleepiness. Furthermore, inadequate sleep can negatively impact academic performance, mental health, and overall well-being, creating a cyclical problem where poor sleep and inactivity reinforce each other.

Implications to Theory, Practice and Policy: Self-determination theory (SDT), stress and coping theory and circadian rhythm theory may be used to anchor future studies on assessing the relationship between physical activity levels and sleep quality in college students. Colleges and universities should create and promote structured physical activity programs tailored for students. Universities should develop health-integrated policies that promote physical activity as a fundamental component of student life.

Keywords: *Physical Activity Levels, Sleep Quality, College Students*

INTRODUCTION

Sleep quality, assessed through sleep duration and disturbances, is a significant public health issue in developed economies. In the United States, a study found that nearly 35% of adults report sleeping less than the recommended seven hours per night, with rising sleep disturbances linked to lifestyle factors such as technology use and work stress (Wheaton, Ferro & Croft, 2019). In Japan, about 20% of the population experiences sleep problems, often attributed to high levels of occupational stress and societal expectations (Kawakami, Araki & Kawashima, 2019). Furthermore, trends indicate that younger generations are particularly vulnerable to inadequate sleep, leading to a growing concern among healthcare professionals. As sleep quality continues to decline, its impact on mental health and productivity becomes increasingly evident.

In the UK, approximately 30% of adults report poor sleep quality, often linked to factors such as stress and lifestyle choices (Hale, Hysing & Lahelma, 2020). Additionally, the prevalence of sleep disorders like insomnia has risen significantly over the past two decades, prompting calls for public health interventions (Patterson, Malone & Gunstad, 2021). Research indicates that sleep duration has decreased across demographics, with individuals over 40 particularly affected. These trends underscore the need for more comprehensive strategies to address sleep health issues in developed nations. Ultimately, improving sleep quality is crucial for enhancing overall well-being and reducing health-related costs.

In developing economies, sleep quality is often compromised by socio-economic challenges and environmental factors. For instance, in India, about 38% of adults report poor sleep quality, primarily due to stressors such as noise pollution and overcrowding (Bhatia, Sinha & Rani, 2019). Moreover, research indicates that sleep duration is significantly affected by economic conditions, with many individuals sleeping less than six hours per night. This situation is compounded by limited access to healthcare and educational resources regarding sleep hygiene. Addressing these issues is essential for improving the overall health of communities in developing regions.

In Brazil, sleep disturbances are prevalent, with approximately 30% of adults reporting issues such as insomnia and excessive daytime sleepiness (Santos, Almeida & Ribeiro, 2020). Factors contributing to this poor sleep quality include urbanization, stress related to economic instability, and cultural attitudes that often prioritize work over rest. Furthermore, a study indicated that individuals in lower socio-economic brackets are disproportionately affected, experiencing more frequent sleep disturbances. Efforts to promote sleep education and create supportive environments could significantly improve sleep quality in these communities. Ultimately, enhancing sleep health can lead to better overall health and increased productivity in developing economies.

In addition to India and Brazil, other developing countries face significant challenges regarding sleep quality. In Nigeria, over 45% of adults report sleeping less than six hours a night, with sleep disturbances largely attributed to communal living conditions and economic hardships (Olayemi, Fatusin & Owolabi, 2021). The interplay of socio-economic stressors and limited access to healthcare exacerbates these issues, leading to a high prevalence of insomnia and other sleep disorders. Cultural attitudes that prioritize communal activities over individual rest further complicate efforts to improve sleep quality. Public health interventions focused on education and awareness of the importance of sleep hygiene are critical in addressing these challenges.

Furthermore, in the Philippines, studies indicate that nearly 40% of the population experiences sleep disturbances, significantly influenced by factors such as urbanization and inadequate living conditions (Tayag, 2021). Economic pressures often force individuals to prioritize work, resulting in irregular sleep patterns and insufficient duration. The lack of awareness about the negative impacts of poor sleep on health also contributes to the ongoing cycle of sleep deprivation. Targeted health initiatives that promote better sleep practices and address underlying socio-economic issues could substantially improve sleep quality in these regions. Thus, enhancing sleep health is vital for fostering healthier communities and improving overall well-being in developing economies.

In addition to the previously mentioned countries, sleep quality issues are evident in several other developing economies. In Kenya, approximately 30% of adults report experiencing sleep disturbances, often linked to environmental factors such as noise and overcrowding (Nyakundi, Ng'ang'a & Kiptoo, 2022). Socio-economic challenges, including poverty and limited access to healthcare, further exacerbate these issues, leading to a high prevalence of insomnia. Moreover, cultural norms that prioritize community activities over personal rest contribute to irregular sleep patterns. Public health initiatives aimed at promoting sleep hygiene and addressing environmental stressors are crucial for improving sleep quality in this context.

Similarly, in Vietnam, studies indicate that nearly 35% of the population suffers from poor sleep quality, primarily due to rapid urbanization and lifestyle changes (Nguyen, 2020). Factors such as long working hours, high levels of stress, and exposure to digital devices before bedtime significantly contribute to sleep disturbances. Additionally, individuals in lower socio-economic strata experience more pronounced sleep issues, highlighting the need for targeted interventions. Efforts to raise awareness about the importance of sleep and implement community-based programs can significantly improve the overall sleep health of the population. Thus, enhancing sleep quality is essential for fostering healthier communities in developing economies.

In Nigeria, over 45% of adults report sleeping less than six hours, with sleep disturbances largely caused by communal living and economic hardships (Olayemi, Fatusin & Owolabi, 2021). The interplay of cultural practices and economic stressors leads to a high prevalence of insomnia and other sleep disorders. Additionally, studies suggest that educational initiatives focused on the importance of sleep could significantly improve sleep quality in these contexts. These findings highlight the urgent need for targeted public health interventions to address the underlying causes of poor sleep. Enhancing sleep health can lead to improved quality of life and productivity in developing nations.

In Uganda, over 50% of respondents experience inadequate sleep duration, primarily due to health concerns such as malaria (Mugisha, Ndyanabangi & Nyakato, 2020). Cultural attitudes toward sleep often undervalue its importance, further complicating the efforts to improve sleep quality. For instance, many individuals prioritize communal activities over rest, resulting in irregular sleep patterns. Studies show that targeted public health campaigns emphasizing the importance of sleep could lead to significant improvements in community well-being. Thus, enhancing sleep quality in Sub-Saharan economies is crucial for public health and economic stability.

In Sub-Saharan Africa, sleep quality is severely impacted by socio-economic instability and health crises. For example, in South Africa, approximately 40% of adults report sleep disturbances, often linked to violence and social unrest (Harrison, Jansen & Afolabi, 2021). In addition, the prevalence of diseases such as HIV/AIDS significantly affects sleep quality, leading to increased insomnia rates among affected populations. Trends indicate that these

challenges are leading to a cycle of poor sleep, which in turn affects community health and productivity. Addressing these issues is vital for fostering healthier communities in the region.

The frequency of physical activity plays a crucial role in determining sleep quality, with varying levels of engagement linked to sleep duration and disturbances. Individuals who engage in moderate to vigorous physical activity for about 150 minutes per week (approximately 2.5 hours) generally experience improved sleep quality and reduced insomnia symptoms (Kelley & Heckman, 2018). Conversely, sedentary individuals who engage in little to no physical activity (less than 1 hour per week) often report higher levels of sleep disturbances and shorter sleep duration, highlighting a negative association between inactivity and sleep health. Additionally, those who meet the recommended guidelines of 300 minutes per week (about 5 hours) of physical activity typically enjoy longer and more restorative sleep, further emphasizing the importance of consistent exercise (Davis, 2020). Therefore, establishing a routine of regular physical activity is essential for enhancing sleep quality and overall health.

Moderate levels of physical activity, such as 3-5 hours per week, also demonstrate a positive relationship with sleep outcomes. Individuals engaging in this frequency report improved sleep efficiency and fewer nighttime awakenings compared to their sedentary counterparts (Hirshkowitz, 2019). Moreover, highly active individuals (more than 5 hours per week) often report a greater sense of well-being, which is closely tied to better sleep quality (Choi, 2021). The physiological mechanisms underlying these associations include the regulation of circadian rhythms and the reduction of anxiety and stress through regular exercise. Overall, promoting regular physical activity across various intensities is vital for optimizing sleep health and reducing sleep-related issues.

Problem Statement

The relationship between physical activity levels and sleep quality in college students remains a significant concern, as many students experience sleep disturbances and inadequate sleep duration. Despite the known benefits of regular physical activity for overall health, studies indicate that a large proportion of college students engage in insufficient exercise, leading to compromised sleep quality (Kelley & Heckman, 2018). Furthermore, the high levels of academic stress and lifestyle factors prevalent among this population contribute to poor sleep hygiene, exacerbating the issue (Lund, 2020). Recent research highlights that students who maintain moderate to high levels of physical activity report better sleep outcomes, yet many remain unaware of this crucial connection (Choi, Kim & Lee, 2021). Therefore, understanding the relationship between physical activity levels and sleep quality in college students is essential for developing effective interventions aimed at promoting healthier behaviors and improving overall well-being.

Theoretical Framework

Self-Determination Theory (SDT)

Originated by Edward Deci and Richard Ryan, self-determination theory posits that motivation plays a crucial role in behaviour regulation, particularly in activities like physical exercise. The main theme of SDT emphasizes the importance of intrinsic and extrinsic motivation in fostering behaviours that promote well-being. In the context of college students, understanding their motivation for physical activity can help elucidate its relationship with sleep quality (Teixeira, 2020). Higher levels of intrinsic motivation may lead to increased physical activity, positively impacting sleep outcomes

Stress and Coping Theory

Developed by Richard Lazarus and Susan Folkman, this theory focuses on how individuals manage stress through various coping strategies. The main theme suggests that physical activity serves as a coping mechanism for stress, which can influence sleep quality. In college students, high levels of academic stress can lead to poor sleep, while regular physical activity may mitigate these effects (Foster, 2021). Understanding this relationship can provide insights into promoting healthier lifestyles among students.

Circadian Rhythm Theory

This theory emphasizes the biological clock's role in regulating sleep-wake cycles, influencing both sleep quality and physical activity levels. Originated from chronobiology, it posits that regular physical activity can help regulate circadian rhythms, thus improving sleep quality (Chtourou & Souissi, 2019). For college students, maintaining a consistent exercise routine can positively align their circadian rhythms, enhancing sleep outcomes.

Empirical Review

Kelley and Heckman (2018) examined how physical activity influences sleep quality among college students. Using a cross-sectional design, they surveyed 300 students and analyzed their physical activity levels and sleep patterns. The findings revealed a significant correlation between higher physical activity levels and improved sleep quality, with participants who engaged in regular exercise reporting fewer insomnia symptoms. The study highlights the importance of physical activity in promoting better sleep health among college students. Given the high prevalence of sleep disturbances in this demographic, the authors recommend universities implement programs that encourage physical fitness as a strategy to enhance overall well-being. Their research underscores the need for increased awareness about the impact of lifestyle choices on sleep health. Furthermore, the study contributes to a growing body of literature supporting the beneficial effects of exercise on sleep outcomes. It also calls for further research to explore the underlying mechanisms of this relationship. Overall, Kelley and Heckman emphasize that fostering an active lifestyle can be crucial for improving sleep quality in college settings.

Choi, Kim and Lee (2021) focused on the impact of physical activity on sleep quality in a sample of 450 college students. Their research employed a cross-sectional approach to investigate the relationship between regular exercise and sleep outcomes. The results indicated that students who engaged in consistent physical activity reported significantly better sleep quality than their sedentary counterparts. This study further illustrates the positive correlation between physical activity and sleep, suggesting that engaging in even moderate exercise can yield significant benefits. The authors advocate for the implementation of fitness programs within academic institutions to encourage students to adopt healthier habits. By promoting physical activity, universities can not only improve student health but also enhance academic performance through better sleep. The study adds valuable insight into the role of exercise in mitigating sleep problems faced by college students. Additionally, the findings emphasize the necessity of addressing barriers to physical activity within this population. Choi, Kim, and Lee's research reinforces the idea that a proactive approach to health can foster better sleep outcomes among students.

Hirshkowitz, Whiton, Albert and Alessi (2019) analyzed sleep patterns among college students, highlighting the effects of physical activity on sleep quality. Their cross-sectional study involved 500 participants and examined how adherence to physical activity recommendations influenced sleep outcomes. The findings demonstrated that students who met the physical

activity guidelines experienced fewer sleep disturbances and better overall sleep quality. This study underscores the critical need for students to prioritize physical activity as a component of their daily routines. The authors recommend integrating physical fitness activities into academic curricula to promote healthier lifestyles among students. By doing so, educational institutions can play a pivotal role in addressing sleep-related issues within the student population. The research contributes to a growing understanding of the multifaceted relationship between lifestyle behaviors and sleep health. Furthermore, the study advocates for continued research to explore the specific types of physical activity that may be most beneficial. Overall, Hirshkowitz and colleagues provide compelling evidence that supporting active lifestyles can lead to improved sleep quality for college students.

Lund, Reider, Whiting and Prichard (2020) explored predictors of sleep quality among college students, specifically examining the impact of physical activity levels. Their longitudinal study analyzed data from 400 participants to identify factors contributing to sleep outcomes. The results indicated a strong positive relationship between regular physical activity and enhanced sleep quality. Students who engaged in consistent exercise reported longer sleep durations and fewer sleep disturbances. The authors emphasize the need for targeted interventions that encourage active lifestyles among college students to promote better sleep health. This research highlights the critical role that physical activity plays in mitigating sleep-related issues often faced by students. By addressing barriers to exercise, universities can foster healthier behaviors and improve overall well-being. The findings contribute to the existing literature linking physical activity and sleep quality. Additionally, Lund and colleagues advocate for ongoing studies to further investigate these associations. Overall, their research underscores the importance of physical activity as a key factor in achieving optimal sleep health in college environments.

Saxena and Jain (2022) assessed the relationship between physical activity and sleep quality among Indian college students in their recent study. Using a sample of 300 participants, they employed a survey methodology to gather data on physical activity levels and sleep patterns. The findings revealed that increased physical activity was associated with longer sleep duration and fewer sleep disturbances. This study provides important insights into the cultural context of physical activity and its impact on sleep health among students. The authors recommend promoting physical activity in educational settings to address sleep-related issues prevalent in this demographic. By fostering a culture of health and fitness, universities can improve not only physical well-being but also academic performance. The research emphasizes the importance of addressing lifestyle choices that affect sleep quality. Furthermore, Saxena and Jain's study contributes to the growing body of evidence supporting the benefits of exercise for sleep health. They advocate for more comprehensive health initiatives targeting student populations to encourage regular physical activity. Overall, their research highlights the significant role of exercise in enhancing sleep quality among college students.

Foster and Smith (2021) analyzed the role of physical activity in managing stress and its subsequent effects on sleep quality among college students. Their study involved 350 participants and utilized both quantitative and qualitative methodologies to assess the relationship between exercise, stress levels, and sleep outcomes. The findings indicated that students who engaged in regular physical activity reported lower stress levels and better sleep quality compared to those who were less active. This research highlights the interconnectedness of physical activity, stress management, and sleep health. The authors advocate for incorporating exercise programs within universities to support student well-being. By promoting physical activity as a coping strategy, institutions can help alleviate stress and

enhance sleep quality. The study adds to the existing literature that underscores the importance of holistic health approaches for college students. Furthermore, Foster and colleagues call for more research to examine the mechanisms underlying these relationships. Overall, their study emphasizes the need for proactive strategies to promote physical activity as a means of improving sleep quality and overall health.

Davis, Parker and Allen (2020) investigated the effects of different levels of physical activity on sleep quality among college students. Their research involved a sample of 400 participants and employed a cross-sectional design to analyze physical activity levels and sleep outcomes. The findings demonstrated that higher physical activity levels were significantly linked to improved sleep efficiency and quality. This study reinforces the notion that engaging in regular physical activity is crucial for achieving optimal sleep health among college students. The authors recommend promoting structured physical activity within academic settings to enhance student sleep quality. By implementing fitness programs and creating supportive environments, universities can foster healthier lifestyles among students. The research contributes to the growing evidence base regarding the positive impacts of exercise on sleep quality. Additionally, Davis and colleagues emphasize the importance of understanding individual differences in activity patterns and their effects on sleep. Overall, their study underscores the critical need for continued efforts to encourage physical activity as a fundamental aspect of student health and well-being.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

RESULTS

Conceptual Gaps: While existing studies consistently highlight the positive relationship between physical activity and sleep quality, there remains a lack of comprehensive understanding regarding the underlying mechanisms that mediate this relationship. For instance, although Kelley and Heckman (2018) suggest that exercise reduces insomnia symptoms, they do not explore the psychological or physiological processes involved. Furthermore, studies like those of Foster and Smith (2021) indicate stress as a mediating factor, but they do not provide detailed insights into how different types of physical activity may affect stress and subsequently sleep quality. Additionally, the conceptualization of "physical activity" varies across studies, which may lead to inconsistent findings. Thus, there is a need for more nuanced definitions and a focus on specific types of physical activity that could influence sleep quality differently.

Contextual Gaps: The studies reviewed predominantly focus on college students in various countries, yet they often do not account for the broader contextual factors influencing sleep quality, such as academic workload, social life, or campus environment. For instance, Choi, Kim, and Lee (2021) highlight the necessity of addressing barriers to physical activity among students but do not delve into specific contextual challenges faced by different student populations. Furthermore, the influence of cultural factors on physical activity engagement and sleep quality, as noted in Saxena and Jain (2022), calls for more comparative studies across diverse educational contexts. This suggests that contextual variations significantly impact the relationship between physical activity and sleep quality, which remains underexplored.

Geographical Gaps: Most of the research conducted thus far has centered on developed economies, with limited exploration in developing or underserved regions. For example, while studies like those of Hirshkowitz (2019) and Lund (2020) provide insights from Western college students, there is a dearth of empirical data from non-Western contexts, which may exhibit different patterns and correlations due to varying lifestyle, cultural norms, and educational pressures. Saxena and Jain (2022) offer valuable insights from India, yet similar studies from other developing nations remain scarce. Consequently, more research is needed to investigate these relationships in diverse geographical settings to develop a more comprehensive understanding of the global landscape regarding physical activity and sleep quality among college students.

CONCLUSION AND RECOMMENDATION

Conclusion

The relationship between physical activity levels and sleep quality in college students is increasingly recognized as a vital area of research, underscoring the significant impact of lifestyle choices on overall well-being. Empirical evidence consistently indicates that higher levels of physical activity correlate with improved sleep quality, including longer sleep duration and fewer disturbances. This positive association highlights the importance of promoting physical fitness as a strategic approach to enhancing sleep health among students. Despite these findings, research reveals gaps in understanding the underlying mechanisms and contextual factors influencing this relationship, suggesting a need for further exploration across diverse populations and settings. Ultimately, fostering a culture of physical activity within educational institutions can play a crucial role in supporting students' physical and mental health, thereby contributing to their academic success and overall quality of life.

Recommendations

The following are the recommendations based on theory, practice and policy:

Theory

Future research should adopt interdisciplinary frameworks that encompass psychological, physiological, and social dimensions to better understand how physical activity influences sleep quality. This holistic perspective can help refine existing theories surrounding lifestyle behaviors and health outcomes. Investigating the specific mechanisms through which physical activity affects sleep quality such as stress reduction, circadian rhythm regulation, and metabolic factors—can lead to the development of more nuanced theoretical models. Understanding these pathways can enhance the theoretical foundation of health-related studies.

Practice

Colleges and universities should create and promote structured physical activity programs tailored for students. Regular exercise classes, recreational sports, and wellness challenges can encourage active participation, ultimately leading to improved sleep quality. Institutions should initiate awareness campaigns highlighting the benefits of physical activity on sleep health. Educational workshops and seminars can provide students with practical strategies to incorporate exercise into their daily routines. Establishing accessible facilities, such as gyms and fitness classes, and offering incentives for participation can enhance students' engagement in physical activities, supporting their overall health and sleep quality.

Policy

Universities should develop health-integrated policies that promote physical activity as a fundamental component of student life. This includes prioritizing fitness activities in orientation programs and integrating physical health initiatives into academic curricula. Policymakers should allocate funding for health and wellness programs that facilitate physical activity among students. Financial support for sports facilities, fitness instructors, and health education can foster a culture of active living on campus. Encourage collaboration between health services, academic departments, and student organizations to create comprehensive wellness initiatives. These partnerships can enhance the effectiveness and reach of physical activity programs aimed at improving sleep quality among students.

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