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ASSESSING THE PREVALENCE AND DIFFERENCES IN PHYSICAL INACTIVITY, POOR SLEEP QUALITY AND MENTAL HEALTH PROBLEMS AMONG SCHOOL-GOING AND COLLEGE-GOING ADOLESCENTS

Original Research

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ABSTRACT

Background: Adolescents face significant health challenges, including physical inactivity, poor sleep quality (SQ), and mental health problems, which can adversely affect their overall well-being and academic performance. These issues are particularly concerning among school-going and college-going adolescents due to their unique developmental and social environments. Understanding the prevalence and differences in these factors is essential to develop interventions aimed at improving their health outcomes and quality of life.

Objective: This study aimed to investigate the prevalence and differences in physical inactivity, poor SQ, and mental health problems among school-going and college-going adolescents.

Methods: A cross-sectional survey design was employed, with a sample of 400 adolescents: 200 school-going participants recruited from three schools and 200 college-going participants from two colleges in Lahore, Pakistan. Inclusion criteria required participants to be 10–18 years old and not diagnosed with mental or sleep disorders. Data collection tools included the Pittsburgh Sleep Quality Index (PSQI) for sleep quality, the International Physical Activity Questionnaire (IPAQ) for physical activity levels, and the Hospital Anxiety and Depression Scale (HADS) for mental health assessment. Descriptive statistics and independent samples t-tests were conducted using SPSS V22.0, with significance set at $p < 0.05$.

Results: The study revealed that 52.0% of college-going adolescents reported low physical activity levels, compared to 33.0% of school-going adolescents. Medium activity levels were observed in 42.5% of college students and 45.0% of school students, while high activity levels were higher in school-going adolescents (22.0%) compared to college-going adolescents (5.5%). Poor SQ was observed in 65.0% of college-going adolescents versus 47.5% of school-going adolescents. Mental health problems categorized as abnormal were reported in 45.5% of college students and 43.5% of school students, with no significant differences between the groups ($t(398) = -0.33$, $p = 0.739$).

Conclusion: The findings highlight the high prevalence of inactivity, poor SQ, and mental health problems among adolescents, emphasizing the need for interventions targeting physical activity to improve sleep and mental health outcomes. Comprehensive approaches addressing multiple dimensions of adolescent well-being are critical for fostering improved academic and health outcomes.

Keywords: Adolescent, Anxiety, Depression, Exercise, Mental Health, Sleep Quality, Students.

INTRODUCTION

Adolescents' mental and physical health has become a focal point of research due to the increasing recognition of its importance in shaping future health outcomes. Among this population, school-going and college-going adolescents represent distinct yet underexplored groups, warranting greater investigative attention to understand the unique challenges they face (1, 2). Recent years have seen a growing consensus, including from the World Health Organization (WHO), regarding the detrimental effects of physical inactivity, poor sleep quality (SQ), and mental health problems, all of which are significant public health concerns in this age group (3-5). While regular physical activity is well-documented for its extensive health benefits, physical inactivity has been linked to compromised cardiovascular function and overall physical well-being (6). Moreover, physical activity is intricately connected to SQ, influencing the ability to fall and stay asleep, as well as overall sleep effectiveness.

Sleep quality encompasses factors such as sleep duration, the ease of falling asleep, the feeling of being well-rested, and the timing of wakefulness (7). Poor SQ negatively impacts cognitive functions, emotional regulation, and general health, whereas good SQ enhances physical and mental well-being by promoting emotional resilience, stress management, and immune function while reducing the risk of chronic diseases (8, 9). Notably, individuals who engage in regular physical activities tend to report lower rates of mental health issues, emphasizing the interconnected nature of these factors (10).

Mental health, defined as a state of well-being in which an individual can effectively manage stress, maintain relationships, and perform daily tasks, plays a pivotal role in overall quality of life (11, 12). Impaired mental health can compromise immune function, increase the risk of cardiovascular diseases, and cause substantial emotional distress, potentially contributing to conditions like depression and anxiety, which are prevalent among adolescents (13, 14). The escalating rates of anxiety and other mental health issues within this population raise significant concerns, as these conditions not only disrupt emotional well-being but also carry implications for neurological and physical health.

Adolescence represents a critical period of rapid growth and development, encompassing physical, psychosocial, and mental changes that significantly shape an individual's identity and future well-being (15). This phase is characterized by unique challenges, including managing stress, controlling emotions, and fostering relationships, all of which are central to maintaining mental health (16, 17). Disrupted sleep patterns are often observed in adolescents experiencing heightened stress or anxiety, with poor SQ further exacerbating mental health difficulties (18).

While substantial evidence highlights the association between physical activity, SQ, and mental health among adult populations, there remains a notable paucity of research focused on these variables in adolescents. Addressing this gap, the current study aims to investigate two primary objectives: to assess the prevalence of physical inactivity, poor SQ, and mental health problems among adolescents and to explore differences in these variables between school-going and college-going adolescents. By examining these factors, this research seeks to offer valuable insights into strategies for improving mental health and sleep quality within this vulnerable age group.

METHODS

The study employed a cross-sectional survey design to assess the influence of physical activity on adolescents' sleep quality and its association with mental health. Data collection was conducted across five educational institutions in Lahore, Pakistan, including three schools and two colleges. Using the Yamane formula (19), a sample size of 400 adolescents was determined, with equal representation from schools (n = 200) and colleges (n = 200). The participants, aged 10 to 18 years, included both male and female adolescents. Participation was voluntary, ensuring ethical research practices.

Inclusion criteria required participants to meet predefined conditions, ensuring the validity and reliability of the study. Adolescents with official medical diagnoses of mental retardation or sleep disorders were excluded to protect the integrity of the findings. Additionally, individuals from rural areas or other cities were not included, as the study aimed to examine urban adolescents specifically.

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Data were gathered using structured tools designed for this research. Demographic information, including age, class, gender, and locality, was collected to contextualize the findings. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), developed by Smyth (20), which uses a scale from 1 to 4 to measure agreement or disagreement with statements about sleep. A score of 1 indicated "very good" sleep quality, while 4 indicated "very poor." The PSQI has demonstrated high reliability and validity for adolescents, with a Cronbach's alpha of 0.88. Physical activity was measured using the International Physical Activity Questionnaire (IPAQ), developed by Craig and Marshall (21). This tool evaluates the level of physical activity over the past week using seven items, categorizing activity as high, moderate, or low, with results expressed in MET-minutes per week. The IPAQ is a widely recognized tool with a Cronbach's alpha of 0.76, ensuring robust validity. Mental health was assessed through a 14-item questionnaire developed by Hartung and Friedrich (22), which evaluates anxiety and depression. Each subscale includes seven items scored from 0 to 3, with total scores ranging from 0 to 21. Although this tool has a relatively low Cronbach's alpha of 0.52, it remains useful for screening individuals not clinically diagnosed with mental disorders but experiencing significant symptoms of anxiety or depression.

Participants were assured of the confidentiality of their responses and informed that their participation was voluntary and withdrawal was permissible at any stage. The researcher engaged with participants face-to-face, allowing for a more personalized data collection process. This approach enhanced the reliability of responses and facilitated a deeper understanding of the participants' contexts. Each session required approximately 15 minutes per participant.

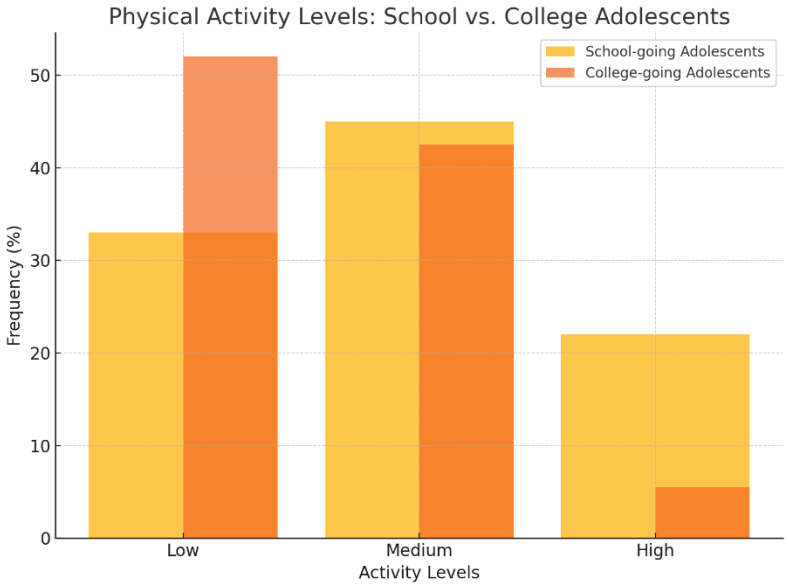
Data analysis was conducted using SPSS (IBM Corp, 2017) version 22.0. Descriptive statistics and independent samples t-tests were employed to evaluate differences between groups. A p-value of less than 0.05 was considered statistically significant, ensuring rigorous interpretation of the results. The manual distribution and collection of questionnaires enhanced the quality of the data and ensured comprehensive engagement with participants. The methodology aligns with ethical standards and robust scientific practices to ensure the reliability and validity of findings.

RESULTS

The findings revealed significant differences in physical activity, sleep quality, and mental health outcomes between school-going and college-going adolescents. Descriptive analysis highlighted that 52.0% of college-going adolescents reported low physical activity levels, compared to 33.0% among school-going adolescents. Medium levels of physical activity were observed in 42.5% of college students and 45.0% of school students, while high activity levels were notably lower in college adolescents (5.5%) compared to their school-going counterparts (22.0%). Poor sleep quality was prevalent in 65.0% of college-going adolescents, markedly higher than the 47.5% observed in school-going adolescents. Mental health problems categorized as abnormal were reported by 45.5% of college students and 43.5% of school students, with borderline mental health issues present in 18.5% and 19.5% of these groups, respectively.

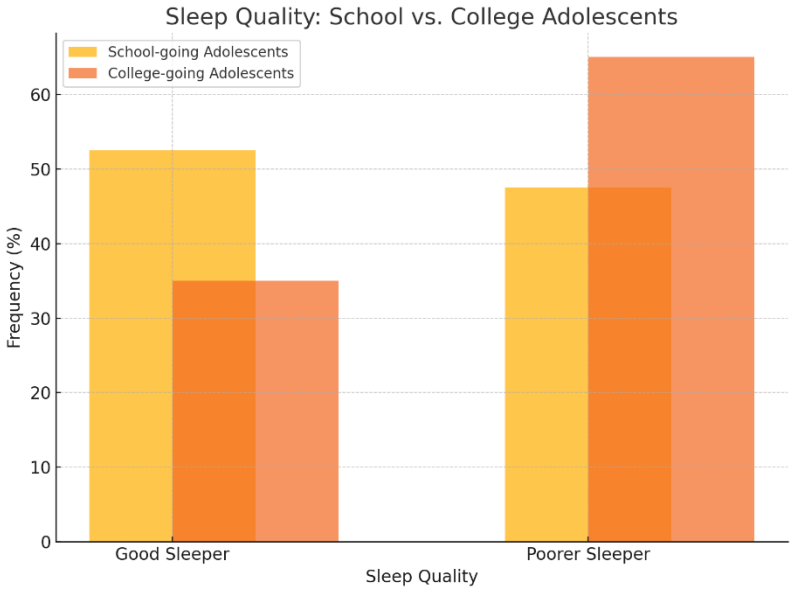
Inferential analysis demonstrated statistically significant differences in physical activity and sleep quality scores between the two groups. School-going adolescents exhibited significantly higher levels of physical activity ($M = 1.89$, $SD = 0.735$) compared to college-going adolescents ($M = 1.54$, $SD = 0.600$), $t(398) = 5.29$, $p < 0.001$. The effect size was limited (Cohen's $d = 0.40$). Similarly, school-going adolescents showed higher sleep quality scores, indicative of poorer sleep ($M = 1.65$, $SD = 0.478$) than college students ($M = 1.48$, $SD = 0.501$), $t(398) = 3.57$, $p < 0.001$, with a small effect size (Cohen's $d = 0.35$). However, no significant difference was found in mental health outcomes between the two groups, $t(398) = -0.33$, $p = 0.739$, suggesting similar mental health profiles across both groups.

These findings underscore the critical need to address physical inactivity and poor sleep quality, particularly among college-going adolescents. Strategies to promote physical activity and improve sleep quality could potentially mitigate mental health challenges in this population. The results lack demographic details, such as the gender distribution or specific age ranges within the participants. This could provide a clearer understanding of the findings and align them with the study's objectives.



The chart comparing physical activity levels highlights significant differences between school-going and college-going adolescents. Among school-going adolescents, 33.0% reported low activity levels, 45.0% moderate, and 22.0% high activity levels. In contrast, 52.0% of college-going adolescents reported low activity levels, 42.5% moderate, and only 5.5% high activity levels. These findings illustrate a concerning decline in physical activity as adolescents transition to college, emphasizing the need for targeted interventions to promote active lifestyles.

Figure 1 Physical Activity Levels



The chart on sleep quality reveals that 65.0% of college-going adolescents reported poor sleep quality compared to 47.5% of school-going adolescents, indicating a higher prevalence of sleep disturbances in the college group. Conversely, 52.5% of school-going adolescents and only 35.0% of college-going adolescents were categorized as good sleepers. These findings underscore the significant impact of educational transitions and stress on sleep quality, highlighting the need for strategies to improve adolescent sleep health.

Figure 2 Sleep Quality

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Table 1 ***Prevalence of Inactivity, Poor SQ and Mental Health Problems in School-going and College-going Adolescents***

Variables	**School-going adolescents**		**College-going adolescents**	
	n (200)	Frequency %	n (200)	Frequency %
Mental Health				
Normal	74	37.0%	72	36.0%
Borderline	39	19.5%	37	18.5%
Abnormal	87	43.5%	91	45.5%

The table illustrates the prevalence of mental health statuses among school-going and college-going adolescents. Among school-going adolescents, 37.0% were categorized as having normal mental health, 19.5% were borderline, and 43.5% fell into the abnormal category. Similarly, among college-going adolescents, 36.0% exhibited normal mental health, 18.5% were borderline, and 45.5% were classified as abnormal. These findings reflect a high prevalence of mental health problems in both groups, with slightly higher abnormal rates among college students.

Table 2 Comparison Scores of Physical Activity, SQ, and Hospital Anxiety and Depression Scale for school-going and college-going adolescents

Variables	**School-going adolescents**		**College-going adolescents**		**t**	**p**	**Cohen's d**
	M	SD	M	SD			
Physical Activity	1.89	.735	1.54	.600	5.29	.000	0.40
Sleep Quality	1.65	.478	1.48	.501	3.57	.000	0.35
Mental Health	2.07	.897	2.10	.900	-.334	.739	0.01

Note: N = 400

The table compares physical activity, sleep quality, and mental health scores between school-going and college-going adolescents. School-going adolescents reported higher physical activity scores (M = 1.89, SD = 0.735) compared to college-going adolescents (M = 1.54, SD = 0.600), with a significant difference ($t(398) = 5.29$, $p < 0.001$, Cohen's d = 0.40). Sleep quality scores were higher for school-going adolescents (M = 1.65, SD = 0.478) than college-going adolescents (M = 1.48, SD = 0.501), showing significant differences ($t(398) = 3.57$, $p < 0.001$, Cohen's d = 0.35). However, mental health scores showed no significant differences ($t(398) = -0.33$, $p = 0.739$, Cohen's d = 0.01), indicating similar mental health profiles across the groups.

DISCUSSION

The study aimed to assess the prevalence of physical inactivity, poor sleep quality, and mental health problems among school-going and college-going adolescents, alongside evaluating the differences in these variables between the two groups. Findings revealed a high prevalence of inactivity, poor sleep quality, and mental health issues across both groups, with college-going adolescents exhibiting higher levels of physical inactivity and better sleep quality compared to their school-going counterparts. However, no significant differences in mental health problems were observed between the groups, highlighting the pervasive nature of these challenges among adolescents.

Previous research aligns with these findings, indicating that adolescents with lower levels of physical activity and poorer sleep quality are more prone to mental health problems (Ghrouz et al., 2019). The study underscores the growing impact of technological

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advancements and increased screen time, which may contribute to these trends by promoting sedentary behaviors and disrupting sleep cycles (WHO, 2021). College students' higher academic workload and stress levels may further exacerbate physical inactivity, as supported by studies that link academic pressures to reduced physical activity and sedentary lifestyles (Chen et al., 2020). These observations emphasize the critical need for interventions addressing these barriers to promote healthier behavioral patterns among adolescents.

Despite the evidence supporting the relationship between physical activity, sleep quality, and mental health, this study noted a conflicting finding: school-going adolescents exhibited better physical activity levels but poorer sleep quality compared to college-going adolescents. This contradicts existing literature, which often associates increased physical activity with improved sleep quality (Alfonsi et al., 2020). The discrepancy may point to multifactorial influences on adolescent sleep quality, including academic schedules, stress, and social dynamics, rather than physical activity alone. This highlights the complexity of these interrelated health domains and the necessity for holistic approaches that incorporate multiple influencing factors.

The study's strengths lie in its focus on both school-going and college-going adolescents, providing a comparative understanding of these groups, and its use of validated tools for data collection. However, limitations include reliance on self-reported data, which may be subject to bias, and the low reliability of the mental health assessment tool, which could affect the precision of findings. Future research should employ more robust instruments and consider longitudinal designs to capture temporal relationships between physical activity, sleep quality, and mental health.

These findings emphasize the urgency of targeted strategies to mitigate physical inactivity, improve sleep quality, and address mental health issues in adolescents. Holistic interventions that integrate lifestyle modifications, stress management, and academic adjustments are vital to fostering better health outcomes in this population.

CONCLUSION

The study underscored the prevalence and differences in physical inactivity, poor sleep quality, and mental health problems among school-going and college-going adolescents. The findings highlight the need for targeted interventions to enhance physical activity levels in both groups, as increased activity can contribute to improved sleep quality and positively impact mental well-being. By addressing these interconnected factors, the overall health and performance of adolescents can be significantly enhanced, fostering better outcomes during this critical developmental stage.

AUTHOR CONTRIBUTIONS

Author	Contribution
Mushavia Saeed	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Asif Ali	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Fariq Ahmed	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muhammad Azam	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Ali Haider	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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