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On Relationship between Quality of Sleep and Physical Activities among the Students of Kashmir Valley

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Abstract: ***The present study explores the intricate relationship between the quality of sleep and physical activity. Both sleep and physical activity are integral components of a healthy lifestyle, and their interaction has been a subject of growing interest in research. The aim of this paper was to delve into the impact of sleep on physical activity and vice versa, highlighting the importance of maintaining a balance between these two aspects for overall well-being. The study revealed that there was a significant negative correlation between physical activity and sleep quality ($r = -0.184$, $P<0.01$) i.e., we can say physical activity can positively predict psychological resilience. This paper also discusses practical strategies to optimize both sleep quality and physical activity levels.***

Keywords: Sleep, Lifestyle, Activity, Relationship, Statistics.

1. INTRODUCTION

The importance of sleep and physical activity for maintaining good health cannot be overstated. Sleep is a crucial physiological process that facilitates recovery, memory consolidation, and overall cognitive functioning (Alhola and Polo-Kantola, 2007). Physical activity, on the other hand, supports cardiovascular health, weight management, and mental well-being. Understanding the dynamic interplay between these two factors can provide insights into improving overall health outcomes. Insufficient or poor-quality sleep can have detrimental effects on physical activity levels (Chattu *et al*., 2018). Sleep deprivation can lead to decreased energy levels, reduced motivation, and impaired physical performance. Additionally, disrupted sleep patterns may alter hormonal balance, potentially affecting

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appetite regulation and promoting weight gain. Research suggests that individuals who experience inadequate sleep are more likely to engage in sedentary behaviour and have decreased enthusiasm for exercise. On the other hand, regular physical activity has been linked to improved sleep quality (Kline, 2014). Engaging in moderate-intensity exercise can help regulate circadian rhythms, making it easier to fall asleep and wake up at desired times. Exercise also releases endorphins, promoting relaxation and reducing stress and anxiety, which can contribute to better sleep. However, intense exercise close to bedtime might have a stimulating effect, disrupting sleep for some individuals.

Studies on sleep reveal that one-third of adults experience sleep issues, and students sleep less than the average population due to academic stress (Ghoreishi and Aghajani, 2008). Alcohol, caffeine, drug use, exercise, big meals, and foods high in tyramine and tryptophan all have a role to play in disrupting sleep (Lawson et al, 2019). According to the report issued by the Global Council on Brain Health (GCBH), the cognitive and physical health of adults is improved when they get a proper sleep of around 7-8 hours every night. Adequate sleep is associated with better physical health, including a stronger immune system, improved cardiovascular health, and better weight management. It also plays a role in regulating hormones related to appetite and metabolism. Regularly getting less than 7 hours of sleep a night is linked to a number of negative health effects, such as weight gain, obesity, diabetes, hypertension, heart disease, stroke, depression, and an elevated chance of death (Watson *et al*., 2015).

Sleep issues among university students are a pervasive concern, often stemming from a confluence of academic pressures, irregular schedules, technology overuse, poor dietary habits, stress, and less-than-ideal living environments. The demands of coursework, exams, and social activities can lead to erratic sleep patterns and heightened stress levels, making it crucial for students to prioritize time management, establish consistent sleep routines, and implement strategies to reduce screen time before bedtime. Sleep issues in university students can often be exacerbated by a lack of physical activity. The sedentary nature of academic life (Carpenter *et al*., 2021), with long hours spent studying or attending lectures, coupled with a tendency to prioritize academic commitments over exercise, can lead to a disruption in sleep patterns. Physical activity not only helps regulate sleep by promoting relaxation and reducing stress, but it also aids in maintaining a healthy sleep-wake cycle. Encouraging students to incorporate regular physical activity into their routines, even in the form of short breaks for a quick walk or stretching exercises, can significantly contribute to better sleep quality and overall well-being during their university years.

On the other hand, improper sleep significantly undermines the physical fitness of university students. The chronic sleep deprivation commonly experienced due to academic pressures and irregular schedules disrupts the student's ability to recover and rebuild after physical activity. This not only leads to decreased exercise performance but also hampers muscle growth and repair (Lamon *et al.*, 2021), compromises immune function (Garbarino *et al.*, 2021), and can contribute to weight gain (Chaput, and Tremblay, 2012) and overall physical deterioration. Furthermore, sleep-deprived individuals often lack the energy and motivation

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required for regular exercise, perpetuating a cycle of physical inactivity and deteriorating fitness. Prioritizing proper sleep hygiene and obtaining adequate rest is crucial for university students to maintain and enhance their physical fitness levels and overall well-being.

With this background, the present research was undertaken to investigate and analyze the association between the quality of sleep and physical activity levels among students in Kashmir, providing insights into the impact of physical activity on sleep patterns and overall well-being in this specific demographic.

2. METHODOLOGY

In present cross-sectional study, we chose 400 students randomly from different higher educational institutions of Kashmir valley via online and offline mode. A well developed validated questionnaire was used to collect the information in view of the literature available on the topic and on the characteristics of the respondents viz., gender, residence,education status, type of family, economic status of family etc.The students who participated in this study on their choice were given a verbal explanation regarding the purpose of this study and were assured that confidentiality would be carried out throughout this study. The sample size for our study was computed using (Cochran, 1977)

$$n = \frac{Z_{\alpha}^{2}\, P(1-P)}{d^{2}}.$$

Here, we take p=0.5, Z_{α} =1.96 and d=0.05. That gives the approximate sample size for our study n~384 and we decided to chose n = 400.

Data Collection Instruments

- Sleep Quality Assessment: The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality. The PSQI is a widely recognized self-report questionnaire that measures various aspects of sleep quality.
- Physical Activity Assessment: Participant's physical activity levels were assessed using the International Physical Activity Questionnaire (IPAQ). This questionnaire will help categorize students into different physical activity groups based on their weekly physical activity levels (low, moderate, high).

Research Hypothesis

Hypothesis: There is no significant difference in the opinion of male and female students.
In order to test these research hypothesis, we use Chi-square test (with usual notations) given as

$$X^{2} = \sum_{i=1}^{2} \frac{(o_i - e_i)^{2}}{e_i}$$

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where $X^2 \sim \chi_1^2$, o_i and e_i are observed and expected frequencies. We reject H_0 if p-value is less than specified level of significance

Data Analysis
Descriptive statistics was used to summarize the demographic characteristics of the participants. To investigate the relationship between sleep quality and physical activities, correlation analysis was employed. Multiple regression analysis was conducted to assess the impact of various physical activity levels on sleep quality, controlling for potential confounding factors such as age, gender, etc. Chisquare test was used to find the association of gender in the opinion and correlation coefficient was used to find the relation between physical activity and quality of sleep. The statistical software SPSS (version 20) was used for analysis of collected data.

Data Interpretation
The results were interpreted in the context of the research objectives, and conclusions were drawn regarding the relationship between sleep quality and physical activities among students in Kashmir.

3. RESULTS

In the current study we had 400 students (male=200 and female =200) selected from various higher educational institutions of Kashmir valley. The data collected from the respondents was analysed and presented in Table 1. It has been observed that statistically there was a non-significant differences in the opinion of male and female respondents with respect to the statements 2, 7, 8 and 9 (P>0.05). In all other statements statistically there was a significant differences in the opinion of male and female respondents. It has been reported that gender among non-modifiable factors play a significant role in quality of sleep and many researchers reported there is a higher rate of sleep problems in females as compared to males.

Table 1: Quality of sleep and physical activities among the students of Kashmir

S. No.	Statement question asked	Response	Gender		X^2	P- Value
			Male (%)	Female (%)		
1.	What are your sleeping hours?	Greater than 8 hours	60	10	88.288	<0.01
		7-8 hours	61	113		
		5-6 hours	39	72		
		Less than 5 hours	40	5		
2.	Do you have a consistent sleep schedule?	Yes	100	86	3.784	>0.05
		No	80	99		
		Not sure	20	15		

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3.	Do you go to bed each night at the same time?	Always	0	15	136.16	<0.01
		Very often	20	123		
		Sometimes	81	57		
		Never	59	5		
4.	When you try to sleep, how long does it take?	5-10 minutes	13	48	26.518	<0.01
		Half an hour	120	84		
		Within one hour	56	58		
		Several hours	11	10		
5.	Do you use smart phones before sleep?	Always	101	92	11.708	<0.01
		Very often	40	21		
		Sometimes	59	87		
		Never	0	0		
6.	Do sound and light have an impact on your sleep?	Always	159	109	49.376	<0.01
		Very often	1	21		
		Sometimes	20	59		
		Never	20	11		
7.	Do you find it difficult to sleep any place other than in your bed?	Always	59	69	6.690	>0.05
		Very often	60	43		
		Sometimes	57	51		
		Never	24	37		
8.	Do you struggle to wake up?	Always	60	41	5.489	>0.05
		Very often	39	43		
		Sometimes	81	98		
		Never	20	18		
9.	Do you consume tea/ coffee before going to sleep?	Always	0	0	3.538	>0.05
		Very often	20	15		
		Sometimes	21	33		
		Never	159	152		
10.	How frequently do you suffer nightmares?	Always	20	0	104.83	<0.01
		Very often	60	31		
		Sometimes	40	138		
		Never	80	31		
11.	Despite getting enough sleep, do you ever feel worn out during the day?	Always	61	16	42.415	<0.01
		Very often	19	52		
		Sometimes	98	110		
		Never	20	22		
12.	Does stress have an impact on how much you sleep?	Always	63	77	18.335	<0.01
		Very often	60	25		
		Sometimes	61	78		
		Never	16	20		
13.	What level of	Perfect	20	7	19.952	<0.01

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	fitness do you currently possess?	Good	61	94		
		Average	79	79		
		Unfit	40	20		
14.	How often do you engage in sports?	Everyday	59	5	89.151	<0.01
		Once in a week	81	53		
		Once in a month	22	30		
		Less often	38	112		
15.	At what time of the day, you are more active?	Morning	78	114	52.329	<0.01
		Noon	59	6		
		Evening	42	57		
		Night	21	23		
16.	While going to the third floor of a building from 1st floor, would you prefer:	Lift/ Elevator	105	62	19.007	<0.01
		Staircase	95	138		
17.	For going 1-2 km far, you would prefer:	Car	20	28	33.377	<0.01
		Bicycle	39	5		
		Walk	123	132		
		Jogging	18	35		
18.	How frequently you go for cycling, in a week:	Everyday	0	0	36.335	<0.01
		2-3 times	19	0		
		Once	21	3		
		Never	160	197		
19.	How often do you meditate?	Everyday	167	32	201.3	<0.01
		2-3 times a week	14	31		
		Once in a week	19	43		
		Never	0	94		
20.	How many hours do you spend daily in house chores?	1 hr	21	35	21.153	<0.01
		1-2 hours	59	33		
		2-3 hrs	47	85		
		Less than an hour	53	47		
21.	Are you enrolled in a gym?	Yes	7	0	7.125	<0.05
		No	193	200		

The data presented in Table 2, revealed that there was a significant negative correlation between physical activity and sleep quality ($r = -0.184$, $P<0.01$). We can say physical activity can positively predict psychological resilience.

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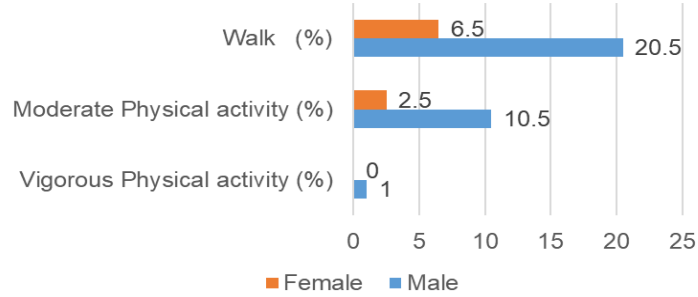
Table 2: Relation between quality of sleep and physical activity

Variables	Correlation Coefficient (r)	P-value
Quality of sleep Physical activity	-0.184	<0.01

The data shown in Figure 1, revealed that among male respondents only 1% are doing vigorous physical activities. Further, 10.5% male and 2.5% female respondents were involved in moderate physical activities. Female 6.5% were involved in walking which was there main physical activity. The Research suggests that moderate-to-vigorous physical activity decrease in recent years. The possible reasons are insufficient time to exercise, inconvenience of exercise, lack of self-motivation, non-enjoyment of exercise, boredom with exercise, lack of confidence in ability to be physically active, fear of being injured or having been injured recently, phone addiction.

Figure 1: Type of physical activities prefered by respondents



4. DISCUSSION

The present study aimed to evaluate the association between sleep quality and physical inactivity among Kashmiri students. The paper delves into a critical aspect of health and well-being, investigating the interconnectedness of sleep quality and physical activity. The study reveals compelling findings, notably a positive correlation between the two variables, with individuals engaging in regular physical activities reporting better sleep quality. High and consistent physical exercise is historically seen as a crucial element of a healthy lifestyle, playing a significant role in both bodily and psychological well-being (Cunningham *et al.*, 2020). Additionally, it highlights the significance of exercise, suggesting that moderate-intensity activities are associated with more extended and deeper sleep. The inclusion of both subjective and objective measures to assess sleep quality enhances the credibility of study, offering a comprehensive perspective. Musculoskeletal pain, physical exhaustion, social stress, social inequalities in physical and mental health, poor work hygiene, occupational stress, and additional occupational hazards can all be proposed as mediators of the relationship between a high physical workload at work and sleep issues (Dubinina *et al.*, 2021). Esnaasharieh *et al.*, 2022 established a relationship between sleep quality and physical

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activity among patients with heart failure. The findings showed that the average score for sleep quality was 8.74 ± 2.83, with the majority of subjects (84.47%) scoring poorly. The total ratings for physical activity and sleep quality showed a substantial and inverse connection, with participant's sleep quality improving as physical activity levels increased. The implications of this research are substantial, emphasizing the importance of promoting physical activity as a means to improve sleep quality, customized exercise plans, and the role of healthcare providers in identifying individuals with sleep problems. This research has significant implications for students seeking to enhance their sleep patterns, underlining the role of physical activity as a non-pharmacological intervention to promote healthy sleep. Zhao *et al.*, 2023 examined the relationship between the physical activity and sleep quality in different population groups. The effect was more pronounced in the children group ($d = 1.24$, $p = 0.03$), followed by the middle-aged and elderly group ($d = 1.98$, $p = 0.037$), but not in the young people group ($d = 1.32$, $p = 0.11$). Despite its strengths, such as a large and diverse sample and longitudinal analysis, the study is limited by its correlational nature, reliance on self-reported data, and potential confounding variables. Overall, this paper underscores the vital relationship between sleep quality and physical activity, but further research is needed to establish causality and explore underlying mechanisms.

5. CONCLUSION

In conclusion, our study on the relationship between the quality of sleep and physical activities among the students of Kashmir has yielded valuable insights into the inter-connectedness of these two crucial aspects of overall well-being. The study showed that physical activity and sleep quality are significantly negatively correlation ($r = -0.184$, $P<0.01$). The relationship between the quality of sleep and physical activity is intricate and bidirectional. Prioritizing both aspects is crucial for achieving and maintaining overall health and well-being. By adopting practical strategies, fostering healthy habits, and recognizing individual differences, individuals can optimize their sleep quality and physical activity levels, ultimately leading to a more balanced and fulfilling life. The findings from our research have highlighted several key points

- **Impact of Physical Activity on Sleep Quality**: Our study found a significant positive correlation between regular physical activity and improved sleep quality. Students who engaged in consistent physical activities, such as exercise or sports, reported better sleep patterns, including shorter sleep latency, increased sleep duration, and enhanced sleep efficiency. This underscores the importance of integrating physical activity into the daily routines of students to promote healthy sleep habits.
- **Sleep Quality Disparities**: We observed that sleep quality varied among students in Kashmir. Factors such as electronic device usage, and irregular sleep schedules were found to negatively influence sleep quality. This implies the need for educational institutions and families to be aware of these factors and take steps to mitigate their effects, thereby promoting better sleep hygiene.
- **Gender Differences**: Our research also revealed gender differences in both physical activity levels and sleep quality. Male students tended to engage in more vigorous

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physical activities compared to their female counterparts, while females reported slightly better sleep quality. Understanding these differences can help tailor interventions and support systems to meet the specific needs of different gender groups.

- **Implications for Health and Well-being**: Quality sleep and regular physical activity are integral components of a healthy lifestyle. Poor sleep quality can lead to various physical and mental health issues, including fatigue, stress, and decreased cognitive function. By promoting physical activity and good sleep hygiene practices among students, we can contribute to their overall well-being and academic success.

Recommendations for Further Research

While our study provides valuable insights, there is still room for further investigation. Future research could delve deeper into the specific types and durations of physical activities that have the most significant impact on sleep quality among students. Additionally, examining the long-term effects of improved sleep quality on academic performance and mental health would be beneficial.

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