



An Analytical Study of the Relationship between Sleep Quality and Sports Performance among Competitive Athletes across Different Sports Disciplines

Dr. Ajay Kumar

Associate Professor in Physical Education, Government College Dujana Jhajjar

ABSTRACT

Sleep is an essential component of recovery and plays a significant role in enhancing athletic performance. The present study aimed to examine the relationship between sleep quality and sports performance among competitive athletes across different sports disciplines. An analytical research design was adopted using an illustrative hypothetical sample of 20 athletes. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while sports performance was evaluated through standardized performance scores. Descriptive statistics, Pearson Product–Moment Correlation, and an independent-samples *t*-test were used for data analysis. The illustrative findings indicated a strong negative relationship between PSQI scores and sports performance, suggesting that athletes with better sleep quality generally achieved higher performance scores. The study emphasizes the importance of maintaining good sleep habits as an integral part of athletic training and recovery. These findings highlight the need for coaches and sports professionals to promote healthy sleep practices to optimize athletic performance. The dataset and statistical results presented in this paper are hypothetical and intended solely for educational purposes.

Keywords: Sleep Quality, Sports Performance, Competitive Athletes, Recovery, PSQI, Athletic Performance.

INTRODUCTION

Sleep is one of the most essential physiological processes for maintaining physical health, mental well-being, and optimal athletic performance. It plays a crucial role in muscle recovery, tissue repair, hormonal regulation, cognitive functioning, and energy restoration. For competitive athletes, adequate sleep is considered a key component of recovery, as it enhances physical fitness, reaction time, decision-making, concentration, and emotional stability. Conversely, poor sleep quality may lead to fatigue, decreased motivation, impaired cognitive performance, slower reaction time, reduced endurance, and an increased risk of injury, all of which can negatively influence sports performance.

Athletes from different sports disciplines often face demanding training schedules, frequent competitions, travel, and psychological stress, which can adversely affect their sleep quality. These factors make it important to examine the relationship between sleep quality and athletic performance. Previous research has shown that athletes with better sleep quality generally perform better in both training and competition, whereas inadequate sleep is associated with reduced physical and psychological performance.

The present study aims to analyse the relationship between sleep quality and sports performance among competitive athletes across different sports disciplines. The findings of this study may help coaches, sports psychologists, and athletes understand the importance of healthy sleep habits and develop effective recovery strategies to enhance athletic performance and overall well-being.

REVIEW OF LITERATURE

Sleep is considered one of the most important recovery strategies for athletes. Numerous studies have reported that adequate sleep enhances physical performance, cognitive functioning, and psychological well-being. Research has consistently shown that poor sleep quality negatively affects reaction time, endurance, strength, accuracy, decision-making, and recovery from training.

Bharti (2025) investigated the combined influence of sleep quality and nutritional habits on body composition among 120 young Indian athletes. The study found that poor sleep quality, along with unhealthy dietary habits, was associated with higher body fat percentage and lower lean muscle mass. The author recommended integrating sleep management with nutritional counselling to optimize athletic development.



Fullagar, H. H. K. et al. (2015) reviewed the relationship between sleep and athletic performance and concluded that inadequate sleep impairs physiological recovery, cognitive performance, and competitive outcomes. They emphasized that sleep should be considered a critical component of athlete recovery programmes.

Mah, C. D. and colleagues (2011) reported that extending sleep duration significantly improved sprint performance, shooting accuracy, reaction time, and mood among collegiate basketball players. Their findings highlighted sleep as an effective strategy for improving athletic performance.

Patel and Ansari (2026) examined the relationship between sleep quality and quality of life among 150 elite national athletes from different sports in India. Using the PSQI and WHOQOL-BREF, they reported that athletes with poorer sleep quality had lower physical and psychological well-being. The study also highlighted that training load, travel, and performance anxiety contributed to sleep disturbances, emphasizing the need for sleep interventions in athlete development programmes.

Recent initiatives by the **Indian Olympic Association** before the Paris Olympics recognized sleep as a key performance factor by engaging a sleep specialist and introducing sleep-focused recovery strategies for athletes. These efforts reflect the growing importance of sleep management in Indian high-performance sports.

Samuels, C. (2009) reported that sleep deprivation decreases alertness, coordination, and mental efficiency while increasing recovery time after intense physical activity. These studies collectively suggest that sleep quality has a substantial influence on athletic performance across different sports.

Watson, A. M. (2017) found that athletes with poor sleep quality experienced greater fatigue, reduced concentration, increased injury risk, and lower performance compared with athletes who maintained healthy sleep habits.

Jaiswal and Shashikala (2020) compared sleep quality between athletes and non-athletes using the **Pittsburgh Sleep Quality Index (PSQI)**. The study included 50 athletes and 50 non-athletes aged 18–25 years. The findings revealed that athletes experienced significantly poorer sleep quality than non-athletes, mainly due to intensive training, muscle fatigue, and competition stress. The authors recommended regular monitoring of athletes' sleep patterns to improve recovery and performance.

Vinu and Panbilnathan (2021) investigated the impact of mobile phone usage on athletes' sleep behaviour during the COVID-19 lockdown in India. Using the PSQI with 550 university athletes, the study found that excessive smartphone use before bedtime was associated with poor sleep quality, delayed sleep onset, and increased daytime fatigue. The researchers concluded that reducing screen time before sleep could improve athletes' recovery and performance.

Research Gap

Although previous studies have established a positive association between sleep quality and athletic performance, several research gaps remain. Most existing investigations have focused on elite athletes from a single sport, such as basketball, football, or swimming. Comparative studies involving athletes from different sports disciplines are limited, particularly in the Indian context. Furthermore, there is relatively little evidence examining sleep quality among competitive athletes participating in various sports under similar competitive environments. Therefore, further analytical research is needed to better understand how sleep quality influences sports performance across different disciplines.

Need and Significance of the Study

Sleep is an essential component of athletic recovery and performance enhancement. Understanding its relationship with sports performance can help athletes, coaches, sports psychologists, physiotherapists, and strength and conditioning professionals design effective recovery strategies. The findings of this study may encourage athletes to adopt better sleep hygiene practices, improve training outcomes, reduce injury risk, and enhance competitive performance. The study may also contribute to the existing body of knowledge in sports science and provide useful information for future researchers and sports organizations.

Objectives of the Study

1. To assess the sleep quality of competitive athletes.
2. To evaluate the sports performance of competitive athletes.
3. To examine the relationship between sleep quality and sports performance.
4. To compare sports performance between athletes with good and poor sleep quality.

Hypotheses

H₀: There is no significant relationship between sleep quality and sports performance among competitive athletes.



H₀₂: There is no significant difference in sports performance between athletes with good sleep quality and those with poor sleep quality.

METHODOLOGY

The study adopted a **quantitative analytical research design**. For demonstration purposes, an **illustrative hypothetical sample of 20 competitive athletes** from different sports disciplines was considered. The sample was selected using **Random purposive sampling**. Sleep quality was assessed using the **Pittsburgh Sleep Quality Index (PSQI)**, while sports performance was measured through standardized performance scores. Descriptive statistics (Mean and Standard Deviation), **Pearson Product–Moment Correlation**, and the **Independent-Samples t-test** were proposed to analyse the relationship between sleep quality and sports performance. All statistical results in this example are illustrative and intended solely for educational purposes.

Below is an **illustrative example** for learning research methods. **All participant data, statistics, tables, and interpretations are hypothetical and must not be reported as real research findings.**

Table 1. Illustrative Dataset (N = 20)

Athlete	PSQI Score	Sleep Group	Performance Score
A1	3	Good	92
A2	4	Good	90
A3	5	Good	88
A4	2	Good	94
A5	4	Good	89
A6	3	Good	91
A7	5	Good	87
A8	4	Good	90
A9	3	Good	93
A10	5	Good	88
A11	7	Poor	78
A12	8	Poor	75
A13	6	Poor	80
A14	9	Poor	72
A15	7	Poor	77
A16	8	Poor	74
A17	6	Poor	81
A18	9	Poor	71
A19	7	Poor	76
A20	8	Poor	73
A17	6	Poor	81
A18	9	Poor	71
A19	7	Poor	76
A20	8	Poor	73

Descriptive Statistics

Table 2. Descriptive Statistics (Illustrative)

Variable	N	Mean	SD
PSQI Score	20	5.65	2.17
Performance Score	20	83.05	8.18

Interpretation:

The average PSQI score was **5.65 ± 2.17**, indicating moderate variation in sleep quality. The average sports performance score was **83.05 ± 8.18**, suggesting moderate variability in performance among the illustrative athletes.

**Pearson Product–Moment Correlation****Table 3. Correlation Matrix (Illustrative)**

Variables	r	p-value
PSQI Score vs Performance Score	-0.82	<0.001

Interpretation

The illustrative Pearson correlation coefficient ($r = -0.82$) indicates a **strong negative relationship** between sleep quality score (higher PSQI = poorer sleep) and sports performance. In this fictional example, athletes with poorer sleep quality tend to have lower performance scores.

Independent Samples t-Test**Group Classification**

- **Good Sleep:** PSQI ≤ 5 (n = 10)
- **Poor Sleep:** PSQI > 5 (n = 10)

Table 4. Group Statistics (Illustrative)

Group	N	Mean Performance	SD
Good Sleep	10	90.20	2.30
Poor Sleep	10	75.90	3.43

Table 5. Independent Samples t-Test (Illustrative)

Variable	t	df	p
Performance Score	11.18	18	<0.001

Interpretation

The illustrative analysis shows a statistically significant difference in sports performance between athletes classified as good sleepers and poor sleepers. In this example, the good-sleep group achieved higher average performance scores.

SPSS-Style Output (Illustrative)**Descriptive Statistics**

Variable	N	Mean	Std. Deviation
PSQI	20	5.65	2.17
Performance	20	83.05	8.18

Correlations

Variables	PSQI	Performance
PSQI	1.000	-.820**
Performance	-.820**	1.000

Correlation is significant at the 0.01 level (2-tailed). (*Illustrative only.*)

Independent Samples Test

Test	t	df	Sig. (2-tailed)	Mean Difference
Performance	11.18	18	.000	14.30

Illustrative Scatter Plot

Figure 1. Illustrative scatter plot showing that higher PSQI scores (poorer sleep quality) are associated with lower sports performance scores.

Note: All values above are synthetic and provided solely as an example of how statistical analyses and SPSS-style tables can be presented in a research paper.



RESULTS AND DISCUSSION

The present illustrative study examined the relationship between sleep quality and sports performance among competitive athletes across different sports disciplines using a hypothetical sample of 20 athletes. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while sports performance was measured through standardized performance scores. The statistical analyses included descriptive statistics, Pearson Product–Moment Correlation, and an independent-samples *t*-test.

The descriptive statistics indicated that the athletes had a mean PSQI score of 5.65 ± 2.17 , suggesting moderate variation in sleep quality among participants. The mean sports performance score was 83.05 ± 8.18 , indicating moderate variability in athletic performance.

The Pearson correlation analysis demonstrated a **strong negative relationship** ($r = -0.82, p < .001$) between sleep quality and sports performance. Since higher PSQI scores indicate poorer sleep quality, the findings suggest that athletes with poor sleep quality tended to achieve lower sports performance scores. Conversely, athletes reporting better sleep quality generally demonstrated higher performance levels. This relationship supports the growing body of sports science literature emphasizing the importance of adequate sleep for optimizing athletic performance.

The independent-samples *t*-test further revealed a statistically significant difference in sports performance between athletes with good sleep quality and those with poor sleep quality ($t = 11.18, p < .001$). Athletes classified in the good sleep group achieved higher mean performance scores than athletes in the poor sleep group. These findings indicate that sleep quality may play an important role in determining athletic success.

The hypothetical results are consistent with previous research suggesting that sufficient, high-quality sleep improves physical recovery, reaction time, concentration, cognitive functioning, and psychological readiness. Sleep promotes muscle repair through increased growth hormone secretion and helps restore glycogen stores following intensive physical activity. Athletes who maintain regular sleep schedules are therefore more likely to recover effectively and perform consistently during training and competition.

Poor sleep quality, on the other hand, may impair attention, decision-making, coordination, and emotional regulation. In competitive sports, where even minor differences in reaction time or concentration can influence outcomes, inadequate sleep may reduce performance and increase the risk of injury.

Although the statistical findings presented in this paper are illustrative, they demonstrate how sleep quality can be examined as an important predictor of athletic performance. Future empirical studies involving larger and more diverse samples are required to validate these findings and explore additional factors such as nutrition, training load, stress, and recovery strategies.

CONCLUSION

Sleep quality is an essential determinant of athletic performance and overall well-being. The illustrative findings of this study indicate that athletes with better sleep quality tend to demonstrate superior sports performance compared to athletes experiencing poor sleep quality. A strong negative relationship between PSQI scores and performance suggests that deterioration in sleep quality may adversely affect athletic outcomes.

Adequate sleep contributes to physical recovery, cognitive functioning, emotional stability, reaction time, and decision-making, all of which are fundamental for successful sports performance. Therefore, coaches, sports scientists, sports psychologists, and athletes should recognize sleep as an integral component of athletic training rather than merely a period of rest.

Although the present study is based on hypothetical data for educational purposes, it provides a useful framework for future research investigating sleep quality among athletes from different sports disciplines.

Practical Implications

The findings of this illustrative study have several practical implications:

1. Coaches should educate athletes about the importance of maintaining healthy sleep habits.
2. Sports psychologists should include sleep hygiene education in athlete counselling programmes.
3. Athletes should maintain a regular sleep schedule and avoid electronic devices before bedtime.
4. Sports organizations should monitor athletes' sleep quality during intensive training and competitions.
5. Recovery programmes should include adequate sleep alongside nutrition and physical recovery techniques.



6. Sleep assessments may be incorporated into routine athlete monitoring to identify individuals at risk of poor recovery.
7. Improving sleep quality may enhance performance while reducing fatigue and injury risk.

LIMITATIONS

The present study has several limitations:

1. The study is based on a **hypothetical dataset** created solely for educational purposes.
2. The sample size (N = 20) is relatively small and does not represent the broader athlete population.
3. Sleep quality was assessed using a questionnaire rather than objective measures such as actigraphy or polysomnography.
4. Athletes from different sports were analysed together without considering sport-specific performance demands.
5. Other factors influencing performance, including nutrition, training intensity, psychological stress, and injury status, were not included.
6. The cross-sectional design limits the ability to establish causal relationships.

RECOMMENDATIONS

Based on the present study, the following recommendations are proposed:

1. Future studies should include larger and more representative samples of athletes.
2. Researchers should compare sleep quality among athletes from different sports disciplines and competitive levels.
3. Longitudinal studies should investigate the long-term effects of sleep quality on athletic performance.
4. Objective sleep assessment tools such as actigraphy or wearable sleep monitors should be used alongside questionnaires.
5. Future research should examine the combined effects of sleep, nutrition, psychological factors, and training load on sports performance.
6. Sports authorities should develop educational programmes promoting healthy sleep practices among athletes.
7. Coaches should incorporate individualized sleep management strategies into training plans to maximize recovery and competitive success.

REFERENCES (APA)

1. Bhat, S., Chokroverty, S., & Gupta, R. (2019). Sleep disorders in India: Present status and future challenges. *Sleep Medicine*, 56, 1–7.
2. Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213.
3. Fullagar, H. H. K., Skorski, S., Duffield, R., Hammes, D., Coutts, A. J., & Meyer, T. (2015). Sleep and athletic performance: The effects of sleep loss on exercise performance, and physiological and cognitive responses to exercise. *Sports Medicine*, 45(2), 161–186. <https://doi.org/10.1007/s40279-014-0260-0>
4. Gupta, L., Morgan, K., & Gilchrist, S. (2017). Does elite sport degrade sleep quality? A systematic review. *Sports Medicine*, 47(7), 1317–1333.
5. Gupta, R., Pandi-Perumal, S. R., & Kumar, V. M. (2018). Sleep disorders in India: A review of epidemiology and management. *Indian Journal of Sleep Medicine*, 13(2), 45–52.
6. Halson, S. L. (2014). Sleep in elite athletes and nutritional interventions to enhance sleep. *Sports Medicine*, 44(Suppl. 1), S13–S23.
7. Kaur, H., & Singh, J. (2021). Relationship between sleep quality and sports performance among university athletes. *International Journal of Physical Education, Sports and Health*, 8(4), 120–124.
8. Kumar, A., & Sharma, R. (2022). Effect of sleep quality on physical fitness and sports performance among Indian athletes. *International Journal of Physiology, Nutrition and Physical Education*, 7(1), 145–149.
9. Lastella, M., Roach, G. D., Halson, S. L., & Sargent, C. (2015). Sleep/wake behaviours of elite athletes from individual and team sports. *European Journal of Sport Science*, 15(2), 94–100.
10. Mah, C. D., Mah, K. E., Kezirian, E. J., & Dement, W. C. (2011). The effects of sleep extension on the athletic performance of collegiate basketball players. *Sleep*, 34(7), 943–950. <https://doi.org/10.5665/SLEEP.1132>
11. Samuels, C. (2009). Sleep, recovery, and performance: The new frontier in high-performance athletics. *Neurologic Clinics*, 26(1), 169–180.
12. Singh, M., & Yadav, S. (2020). Sleep quality and psychological well-being among competitive athletes. *International Journal of Yogic, Human Movement and Sports Sciences*, 5(2), 56–60.
13. Verma, P., & Sharma, D. (2021). Association between sleep quality and athletic performance among college sportspersons. *International Journal of Physical Education, Fitness and Sports*, 10(3), 30–36.
14. Watson, A. M. (2017). Sleep and athletic performance. *Current Sports Medicine Reports*, 16(6), 413–418.