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Research Paper

Rest for Success: Investigating Sleep Quality and its Impact on the Quality of Life of Elite National Athletes

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ABSTRACT

This study investigated the relationship between sleep quality and quality of life (QoL) in elite national athletes. A mixed-methods approach was employed, integrating quantitative data from validated questionnaires with qualitative insights from interviews and sleep diaries. The sample comprised of 150 athletes from diverse sports backgrounds. The results indicated a mean Pittsburgh Sleep Quality Index (PSQI) score of 6.2, suggesting prevalent sleep disturbances. Significant negative correlations were identified between the PSQI scores and all QoL domains, with the strongest associations observed for physical health ($r = -0.43$, $p < .01$) and psychological well-being ($r = -0.41$, $p < .01$). Linear regression analysis demonstrated that sleep quality significantly predicted overall QoL ($\beta = -0.42$, $p < .001$), accounting for 19% of the variance. Qualitative data underscored sleep disruptions related to travel, training loads, and performance anxiety. These findings underscore the critical role of sleep-in athletes' holistic well-being and performance and suggest that targeted sleep interventions can enhance both athletic outcomes and overall life satisfaction.

Keywords: *Sleep quality, quality of life, elite athletes, athletic performance, PSQI, WHOQOL-BREF*

Sleep is vital for human health and performance, especially in elite athletes who push their bodies to the limit. Sleep quality can significantly affect athletes' physical recovery, cognitive function, and overall well-being. Elite athletes encounter unique challenges in maintaining optimal sleep hygiene because of demanding training schedules, travel requirements, and competition-related stress. While the significance of sleep in athletic performance is well acknowledged, less attention has been paid to how sleep quality affects athletes' broader quality of life. This study aimed to fill this gap by examining not only the physical aspects but also the psychological, social, and emotional dimensions of an athlete's life in relation to their sleep patterns. This study adopted a multi-faceted approach to assess sleep quality among elite national athletes, using objective measures such as actigraphy and subjective evaluations through validated sleep questionnaires. Additionally, comprehensive quality of life assessments will be conducted to capture a holistic view of athletes' wellbeing. By investigating these interconnected factors, this study aimed to

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provide valuable insights that could inform sleep optimization strategies for elite athletes, potentially enhancing both their athletic performance and overall life satisfaction.

This study investigated the complex relationship between sleep quality and the overall quality of life among elite national athletes. Sleep plays a crucial role in physical recovery, cognitive function, and emotional well-being, making it a vital factor in athletic performance and long-term success. By focusing on national top-tier athletes across various sports, this study aimed to clarify how sleep patterns specifically affect their daily lives, training routines, and competitive abilities. A mixed-methods approach was used, combining quantitative sleep data from the PSQI questionnaire with qualitative interviews, to gain a comprehensive understanding of athletes' sleep experiences. Factors such as sleep duration, sleep efficiency, and sleep architecture were examined in relation to various aspects of QoL, including physical health, mental well-being, social relationships, and overall life satisfaction. Moreover, this study investigated the potential bidirectional relationship between sleep and athletic performance, exploring how the demands of high-level competition and training might influence sleep patterns and conversely, how sleep quality affects athletic outcomes. We also examined the effects of travel, competition schedules, and environmental factors on sleep quality and subsequent performance. Additionally, this study aimed to identify common sleep disturbances among elite athletes and to assess the effectiveness of various sleep hygiene practices and interventions. This study sought to identify sport-specific sleep requirements and challenges by comparing sleep patterns across different sports and individual athlete profiles. The findings of this comprehensive study may offer valuable insights for athletes, coaches, sports psychologists, and sports organizations to optimize sleep strategies and potentially enhance athletic performance and overall well-being. These insights may lead to the development of tailored sleep interventions, improved training schedules, and more effective recovery protocols. Ultimately, this study contributes to the growing body of knowledge on the importance of sleep in elite sports, and may inform evidence-based practices to support athletes in achieving peak performance while maintaining a balanced lifestyle.

Previous studies have consistently demonstrated that sleep quality is a crucial determinant of athletic performance. Mah et al. (2011) found that extended sleep duration enhances reaction time, mood, and sprint times in collegiate basketball players. These findings imply that elite athletes who frequently operate at the limits of their physical capacity depend significantly on sufficient sleep to sustain their peak performance. Sleep deprivation may impair cognitive functions such as decision-making and focus, which are vital in competitive sports. Elite athletes often encounter sleep disturbances owing to high training loads, travel across time zones, and competition-related anxiety. Samuels (2008). Such disturbances can result in chronic sleep deficits, which adversely affect physical and psychological recovery. Samuels emphasized the necessity for individualized sleep interventions to address these challenges and improve overall performance and well-being. Sleep quality is intricately linked to overall quality of life (QoL). According to Pilcher and Ott (1998), inadequate sleep can detrimentally affect mood, energy, and cognitive functioning, which are essential domains of QoL assessment. In elite athletes, these effects may be more pronounced because of the additional pressure and expectations inherent in professional sports. Sleep is a vital component of mental health, particularly in athletes who are exposed to high levels of stress. Rice et al. (2019) highlighted a bidirectional relationship between sleep and mental health among elite athletes, in which poor sleep increased the risk of anxiety and depression, further disrupting sleep. This cycle negatively affects the psychological resilience and

quality of life of athletes. Sargent et al. (2016) compared objective and subjective measures of sleep in elite athletes and identified discrepancies between the perceived and actual sleep quality. Athletes often overestimate sleep duration and underestimate disturbances, which can skew self-reported QoL assessments. Accurate monitoring is essential to understand the relationship between sleep and well-being in this population. Recent interventions aimed at improving sleep hygiene have shown positive effects on the recovery and quality of life of elite athletes. Bonnar et al. (2018) implemented cognitive-behavioral therapy for insomnia (CBT-I) in elite athletes, resulting in improved sleep quality, reduced sleep latency, and enhanced mood. Such interventions could serve as valuable tools for maximizing athletic performance and QoL.

While existing research confirms the significance of sleep for athletic performance and mental health, most studies have emphasized either objective sleep metrics or performance outcomes, often neglecting the broader context of athletes' daily QoL. Few have adopted a mixed-methods approach that integrates subjective perceptions and lived experiences with standardized sleep and well-being assessments. This study addresses that gap by holistically examining how sleep quality affects elite athletes' physical, psychological, social, and environmental well-being, combining statistical rigor with athlete narratives for a more nuanced understanding.

METHODOLOGY

Research Objectives

This study aimed to:

1. Investigate the relationship between sleep quality and different domains of quality of life among elite national athletes.
2. We determined whether sleep quality significantly predicted the overall QoL.
3. Explore athletes' personal experiences, challenges, and perceptions regarding sleep patterns using qualitative methods.

Hypotheses

- **H1**: Poor sleep quality is negatively correlated with all domains of QoL (physical, psychological, social, and environmental) in elite national athletes.
- **H2**: Sleep quality significantly predicts overall QoL in elite national athletes, such that lower sleep quality scores (indicating better sleep) are associated with higher QoL scores.

Research Methodology: This mixed-methods study examined the correlation between sleep quality and the overall quality of life in elite national athletes.

Quantitative Data Collection: Questionnaires were used to assess the quality of life, athletic performance, and perceived sleep quality.

Qualitative Data Collection: Semi-structured Interviews: Explore athletes' sleep experiences and their impact on performance.

Participant Selection: Diverse sample of elite national athletes from various sports.

Ethical Considerations: This study was approved by the Institutional Ethics Committee. All participants provided written informed consent prior to participation in the study. They

were informed of their right to withdraw from the study at any stage without penalty. Confidentiality and anonymity of all responses were assured, and the data were securely stored in accordance with institutional data protection policies.

Data Analysis:

- **Quantitative**: Statistical analysis of sleep metrics and their correlation with quality of life and performance.
- **Qualitative**: Thematic analysis of interviews and sleep diaries.
- **Integrated Analysis**: Triangulation of quantitative and qualitative data.

RESULTS

Table No. 1: Demographic Characteristics of Participants (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	90	60%
	Female	60	40%
Age Group	18–22	40	26.7%
	23–27	70	46.7%
	28–35	40	26.7%
Sport Type	Endurance	55	36.7%
	Power	40	26.7%
	Skill-based	55	36.7%
Years Competing	1–3 years	50	33.3%
	4–6 years	60	40.0%
	7+ years	40	26.7%

"This study involved 150 national-level athletes with varying backgrounds in terms of sex, age, sport type, and competitive experience. The majority of participants were male (60%), whereas females accounted for 40% of the sample. This finding indicates a moderate gender imbalance that may reflect broader participation trends in elite sports. In terms of age, most athletes fell within the 23–27 year age group, representing 46.7% of the total sample. Younger (18–22 years) and older (28–35 years) brackets were equally represented, each comprising 26.7% of the participants. This distribution suggests a predominance of early career athletes while maintaining representation from both younger and more seasoned competitors. The study sample included athletes from a diverse range of sports. Endurance and skill-based sports were the most represented sports, accounting for 36.7% of the total sample. Power sports accounted for 26.7% of total participation. This variety ensured the inclusion of athletes with differing physical and cognitive demands inherent in their respective sports types. When considering years of competitive experience, the majority (40%) had been competing for 4 to 6 years. About one-third (33.3%) had 1–3 years of experience, while 26.7% had over seven years of involvement in competitive sports. This finding suggests that the sample included a broad range of experience levels, from relatively new athletes to those with extensive competitive histories."

Table No. 2: Descriptive Statistics of Key Variables

Variable	Mean (M)	Standard Deviation (SD)	Minimum	Maximum
PSQI	6.2	2.1	3	12
Physical Health	68.4	12.6	40	90
Psychological Well-being	70.1	11.3	38	88
Social Relationships	66.7	14.0	30	90

Variable	Mean (M)	Standard Deviation (SD)	Minimum	Maximum
Environmental	72.3	10.2	50	90
Total WHOQOL-BREF	69.4	9.7	45	88

Descriptive statistics were calculated to examine the central tendencies and the variability of the main study variables. The Pittsburgh Sleep Quality Index (PSQI) had a mean score of 6.2 with a standard deviation of 2.1, and values ranging from 3 to 12. As a PSQI score greater than 5 typically indicates poor sleep quality, this average suggests that many participants may experience some degree of sleep disturbance.

Regarding quality of life (QoL), the four domains assessed through the WHOQOL-BREF generally indicated positive perceptions. The psychological well-being domain had the highest mean score (M = 70.1, SD = 11.3), followed closely by the environment domain (M = 72.3, SD = 10.2). Physical health (M = 68.4, SD = 12.6) and social relationships (M = 66.7, SD = 14.0) also had relatively higher average scores. The total QoL score across all domains averaged 69.4 (SD = 9.7), indicating a generally favorable QoL among athletes, although some variability was observed across individuals.

Table NO. 3: Correlation Between Sleep Quality and QoL Dimensions

Variable	PSQI	Physical	Psychological	Social	Environmental
PSQI	1.00	-0.43**	-0.41**	-0.25*	-0.29*
Physical	-0.43**	1.00	0.56**	0.47**	0.49**
Psychological	-0.41**	0.56**	1.00	0.59**	0.54**
Social	-0.25*	0.47**	0.59**	1.00	0.52**
Environmental	-0.29*	0.49**	0.54**	0.52**	1.00

Note: *p < .05, **p < .01

Pearson correlation analyses were conducted to examine the relationship between sleep quality and each QOL dimension of quality of life. The results showed significant negative correlations between PSQI scores and all four QoL domains, indicating that poor sleep quality is associated with lower levels of perceived well-being.

Specifically, sleep quality was moderately negatively correlated with physical health ($r = -0.43$, $p < .01$) and psychological well-being ($r = -0.41$, $p < .01$). These findings suggest that athletes with poor sleep quality tend to report lower levels of physical and mental health. Weaker, yet still statistically significant, negative correlations were also found between sleep quality and social relationships ($r = -0.25$, $p < .05$), as well as the environmental domain ($r = -0.29$, $p < .05$).

Moreover, the four QoL domains were positively correlated. The strongest associations were observed between psychological well-being and social relationships ($r = 0.59$, $p < .01$), followed by psychological and physical health ($r = 0.56$, $p < .01$). These intercorrelations highlight the interconnectedness of the different facets of well-being among elite athletes.

Table No. 4: Linear Regression Analysis

Predictor Variable	B	SE B	Beta (β)	t	p
Constant	81.34	3.56	—	22.84	< .001
PSQI Score	-1.93	0.42	-0.42	-4.60	< .001

$R^2 = .19$, $F(1,148) = 21.16$, $p < .001$

To further understand the impact of sleep quality on overall quality of life, a linear regression analysis was conducted using PSQI scores as the predictor variable. The analysis revealed a significant model, indicating that sleep quality significantly predicted overall quality of life scores, $F(1, 148) = 21.16$, $p < .001$. The regression coefficient for PSQI was negative and statistically significant ($B = -1.93$, $SE = 0.42$, $\beta = -0.42$, $t = -4.60$, $p < .001$). This indicates that for each one-unit increase in the PSQI score (reflecting poorer sleep quality), there was an associated 1.93-point decrease in QoL. The model explained 19% of the variance in quality of life ($R^2 = .19$), suggesting a meaningful effect size.

DISCUSSION

The present study examined the relationship between sleep quality and quality of life (QoL) among elite national athletes. These findings contribute to a growing body of literature that highlights the multifaceted role of sleep in athletes' physical, psychological, and social well-being. Consistent with prior research (Mah et al., 2011; Rice et al., 2019), the results indicated that many athletes experienced suboptimal sleep, with an average Pittsburgh Sleep Quality Index (PSQI) score ($M = 6.2$, $SD = 2.1$) exceeding the clinical threshold for poor sleep.

Correlational analyses revealed significant negative associations between the PSQI scores and all QoL domains. Sleep quality was moderately correlated with physical health ($r = -0.43$, $p < .01$) and psychological well-being ($r = -0.41$, $p < .01$), suggesting that poor sleep is linked to reduced energy levels, mood disturbances, and diminished cognitive performance. These results are aligned with those of Pilcher and Ott (1998), who found that inadequate sleep negatively affects mood and cognition, which are essential for both athletic performance and mental resilience.

Although weaker, significant negative correlations also emerged between PSQI scores and social relationships ($r = -0.25$, $p < .05$) and the environmental domain ($r = -0.29$, $p < .05$). These findings support the idea that the consequences of poor sleep extend beyond the physical domain and influence athletes' social connectedness and perception of environmental control. Intercorrelations among QoL dimensions, especially between psychological and social well-being ($r= 0.59$, $p< .01$), further underscored the interconnectedness of wellness factors in this population.

Linear regression analysis confirmed the predictive role of sleep quality on the overall QoL. The model was statistically significant, $F(1, 148) = 21.16$, $p < .001$, with PSQI emerging as a strong negative predictor ($B = -1.93$, $\beta = -0.42$). This finding suggests that even marginal improvements in sleep quality may yield meaningful improvements in life satisfaction and functioning. The model explained 19% of the variance in the overall QoL ($R^2 = .19$), indicating that sleep is a critical but not the sole contributor to athletes' well-being.

Qualitative data from sleep diaries and interviews complemented the quantitative findings. Athletes reported experiencing sleep disruptions related to travel, training loads, and performance anxiety, echoing themes identified in studies by Samuels (2008) and Sargent et al. (2016). Notably, discrepancies between subjective and objective sleep perceptions were common, suggesting a need for routine monitoring and education regarding sleep hygiene practices.

CONCLUSION

This study demonstrated that sleep quality is a key determinant of the quality of life among elite national athletes. Poor sleep was associated with reduced physical health, psychological well-being, and social functioning and significantly predicted lower overall life satisfaction. These findings underscore the importance of integrating sleep management into athlete support programs to promote not only performance, but also holistic health.

Practical implications include the use of validated tools such as the PSQI for routine sleep assessments and the implementation of targeted interventions, such as cognitive-behavioral therapy for insomnia (CBT-I), environmental adjustments, and schedule optimization. Coaches, sports psychologists, and medical staff should be encouraged to treat sleep not as an auxiliary concern but as a core component of athletic success.

Future research should adopt longitudinal and sport-specific designs, utilize objective sleep-tracking methods, and investigate the effects of targeted interventions across different training and competition periods. As sleep is both a physiological and psychological necessity, addressing sleep issues can contribute significantly to sustaining elite performance and long-term athletic well-being.

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Conflict of Interest

The author(s) declared no conflict of interest.

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