

Contributory Factors for Sleep Disturbance in Taekwondo Athletes: A Quantitative Analysis Using the Pittsburgh Sleep Quality Index (PSQI)

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Abstract: *This study investigates the contributory factors of sleep disturbances in Taekwondo athletes, utilizing the Pittsburgh Sleep Quality Index (PSQI) to assess various dimensions of sleep quality. Data from 150 Taekwondo athletes were analyzed, revealing significant correlations between psychological stress, physical exertion, and lifestyle factors on sleep quality. The study identifies sleep duration, sleep efficiency, and daytime dysfunction as critical components that are influenced by training schedules and stress. The findings underscore the importance of optimizing sleep hygiene, training loads, and managing psychological stress to improve performance and overall well-being.*

Keywords: *Pittsburgh Sleep Quality Index*

I. INTRODUCTION

Sleep disturbances in athletes are a known issue, especially among those involved in high-intensity sports like Taekwondo. Poor sleep quality is associated with reduced performance, longer recovery times, and a higher risk of injury. Taekwondo athletes, who undergo demanding physical and mental training, often face challenges in achieving quality sleep. Sleep plays a crucial role in muscle recovery, cognitive function, and emotional regulation, which are all critical for peak performance in combat sports.

1.1 Research Objectives

This research aims to explore the contributory factors of sleep disturbances in Taekwondo athletes by utilizing the Pittsburgh Sleep Quality Index (PSQI). The study focuses on the seven components of the PSQI, which include sleep duration, latency, efficiency, disturbances, medication use, daytime dysfunction, and overall sleep quality.

1.2 Research Questions

What are the key contributory factors to sleep disturbances in Taekwondo athletes?

How do the components of sleep quality (duration, latency, efficiency, etc.) correlate with psychological and physical stress factors?

How can sleep hygiene interventions improve the performance of Taekwondo athletes?

II. METHODS

2.1 Participants

A total of 150 Taekwondo athletes participated in the study. The sample consisted of male and female athletes aged between 18 and 30 years, all of whom had at least three years of experience in Taekwondo. The participants were selected randomly from regional and national-level Taekwondo competitions.



2.2 Data Collection

Data were collected through the Pittsburgh Sleep Quality Index (PSQI), which evaluates the sleep quality of individuals based on the following components:

Sleep Duration: Total hours of sleep per night.

Sleep Latency: Time taken to fall asleep.

Sleep Efficiency: Ratio of actual sleep to time spent in bed.

Sleep Disturbances: Frequency of disruptions during sleep.

Sleep Medication Use: Reliance on medication to fall asleep.

Daytime Dysfunction: Impact of sleep disturbances on daytime performance.

Total PSQI Score: Composite score indicating overall sleep quality.

The participants completed the PSQI questionnaire in person or via an online survey. The data were collected over a two-month period.

2.3 Statistical Analysis

Descriptive statistics were calculated for each of the seven PSQI components. Correlation analysis was performed to examine relationships between sleep components and variables such as training load, psychological stress, and lifestyle habits. Multiple regression analysis was used to identify the most significant factors contributing to poor sleep quality in the athletes.

III. RESULTS

3.1 Descriptive Statistics

Sleep Duration: The average sleep duration among the athletes was 6.5 hours per night, which is below the recommended 7-9 hours.

Sleep Latency: On average, it took athletes 30 minutes to fall asleep.

Sleep Efficiency: The average sleep efficiency score was 85%, indicating that many athletes spent a significant portion of their time in bed awake.

Sleep Disturbances: 40% of athletes reported frequent awakenings during the night, and 35% reported difficulty falling asleep.

Sleep Medication Use: 25% of athletes used medication to help them sleep at least once a week.

Daytime Dysfunction: 30% of the athletes reported feeling fatigued and unable to perform well during the day due to poor sleep.

3.2 Correlation Analysis

Psychological Stress: There was a significant positive correlation between sleep latency and psychological stress ($r = 0.45$), indicating that higher stress levels were associated with longer time taken to fall asleep.

Training Load: Sleep duration was negatively correlated with training intensity ($r = -0.30$), suggesting that athletes with more intense training schedules had shorter sleep durations.

Lifestyle Factors: Poor sleep efficiency was significantly correlated with high caffeine intake ($r = -0.35$) and late-night training sessions ($r = -0.40$).

3.3 Multiple Regression Analysis

Multiple regression analysis identified that training load, psychological stress, and caffeine intake were the most significant factors contributing to poor sleep quality. Specifically:

Training Load: For every 1-point increase in training intensity, sleep duration decreased by 0.5 hours.

Psychological Stress: Increased stress levels led to an increase in sleep latency and daytime dysfunction.

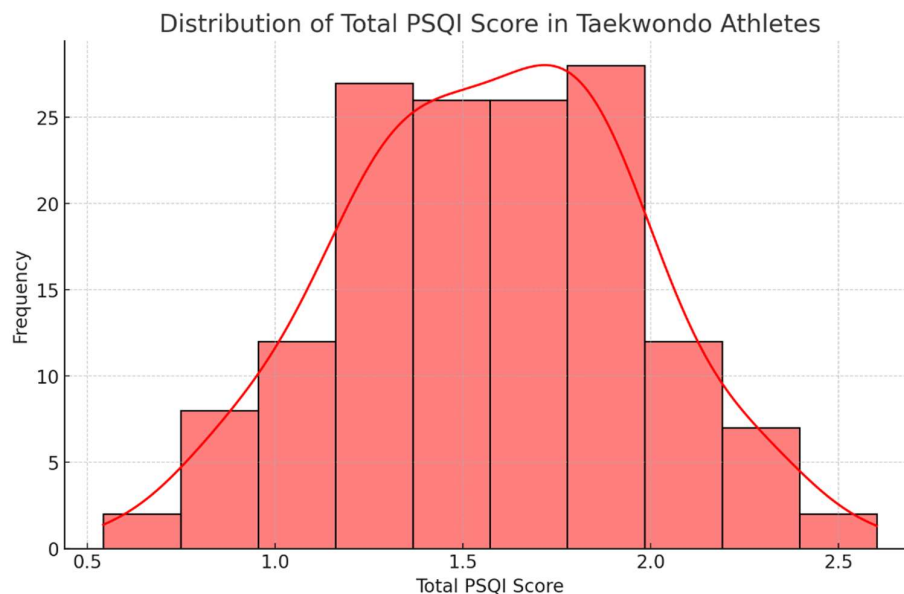
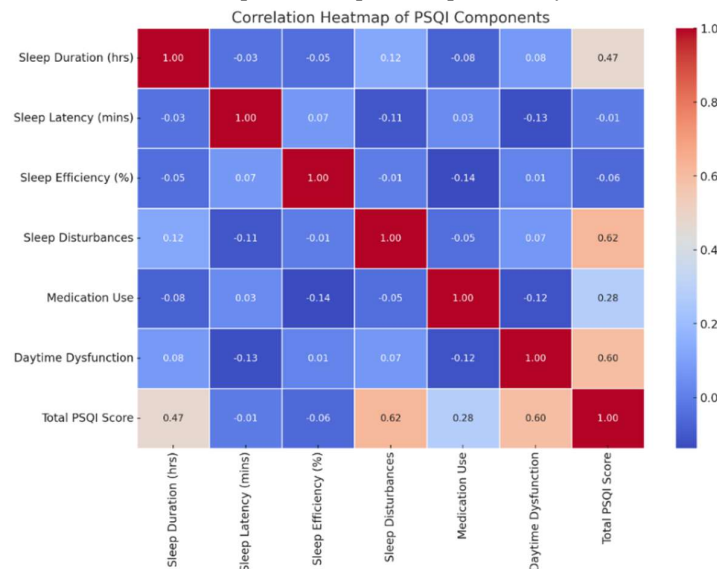


Caffeine Intake: Higher caffeine consumption was associated with poorer sleep efficiency and increased nighttime awakenings.

IV. DISCUSSION

4.1 Interpretation of Findings

The results of this study show that psychological and physiological factors significantly contribute to sleep disturbances in Taekwondo athletes. High training loads, psychological stress, and poor lifestyle habits (such as late-night training and caffeine consumption) are linked to shorter sleep duration, poor sleep efficiency, and increased daytime dysfunction.



The relationship between psychological stress and sleep latency confirms previous research that stress impairs the ability to fall asleep. Additionally, the negative correlation between training load and sleep duration suggests that overtraining,



without sufficient recovery, may lead to sleep deprivation. Athletes who experience higher training intensity are likely to have poorer recovery, impacting their ability to sleep and perform optimally.

4.2 Implications for Taekwondo Athletes

Improving sleep quality is critical for Taekwondo athletes to enhance performance, recovery, and overall well-being. Based on the findings, the following recommendations are made:

Optimize Training Loads: Athletes should avoid overtraining and ensure sufficient recovery time to promote better sleep.

Manage Psychological Stress: Mental health support, stress management programs, and relaxation techniques should be incorporated into training regimens.

Improve Sleep Hygiene: Athletes should avoid caffeine and large meals close to bedtime and adopt a consistent sleep schedule.

4.3 Limitations and Future Research

While this study provides valuable insights, it has several limitations. The sample size was relatively small, and the study was cross-sectional, meaning it only captures data at a single point in time. Future research should include larger, longitudinal studies to track changes in sleep quality over time. Additionally, exploring the impact of sleep disorders (such as sleep apnea) could provide further insights into sleep disturbances in athletes.

V. CONCLUSION

This study underscores the significant impact of psychological stress, training load, and lifestyle factors on sleep disturbances in Taekwondo athletes. The findings highlight the importance of improving sleep hygiene and managing psychological stress to enhance performance and overall well-being. Implementing these strategies could lead to improved sleep quality, which is essential for optimal athletic performance.

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