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Prevalence and Weight Class Differences in Sleep Quality Among Competitive Jujitsu Athletes in Indonesia

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Abstract

Sleep plays a critical role in physiological recovery, cognitive function, and optimal athletic performance. However, limited research has investigated sleep quality among combat sport athletes in Southeast Asia, particularly in weight-class sports such as Jujitsu. This study aimed to examine the prevalence and characteristics of sleep quality among competitive Jujitsu athletes in Surabaya, Indonesia. A descriptive quantitative cross-sectional design was employed involving 56 athletes selected using purposive sampling. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Descriptive statistics and comparative analysis were used to examine sleep quality patterns across gender and weight categories. The results indicated that 69.6% of athletes experienced poor sleep quality, whereas 30.4% demonstrated good sleep quality. The overall mean PSQI score was 6.8 ± 2.6 (95% CI: 4.5–8.9), exceeding the established cutoff value (>5) and indicating generally poor sleep quality among the participants. Poor sleep quality appeared more prevalent among female athletes and those competing in lighter weight classes. Female athletes demonstrated slightly higher PSQI scores compared with male athletes, although the difference showed a small effect size (Cohen's d ≈ 0.15) and was not statistically significant ($p > .05$). These findings highlight the need for structured sleep monitoring and targeted recovery strategies in combat sport training environments. Practical interventions such as sleep hygiene education, optimized training schedules, and monitoring of weight management practices may help improve sleep quality and support athletic performance among Jujitsu athletes.

Keywords: Sleep Quality, PSQI, Athletes, Jujitsu, Combat Sports

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A. Introduction

Sport is a form of physical and psychological activity that plays an important role in maintaining and improving human health (Salahudin & Rusdin, 2020). From a physiological perspective, sport is defined as a series of planned and structured physical movements performed consciously to enhance functional capacity in accordance with training objectives (Palar et al., 2015). One type of sport that has gained widespread popularity across social groups is martial arts. The term "martial arts sport" refers to a class of contact sports in which competitors engage in one-on-one combat under specific rules depending on the discipline practiced (Barley et al., 2019).

Jujitsu is a martial art originating from Japan that has developed in Indonesia since the Japanese occupation, particularly through police institutions. Its development accelerated following a Jujitsu demonstration at the Indonesian Perguruan Tinggi Ilmu Kepolisian (PTIK) in Jakarta and the first national championship held in 1987, which led to the establishment of the Institut Jujitsu Indonesia (IJI) (Rohmansyah, 2017). Jujitsu is not only used for self-defense but has also evolved into a competitive sport that emphasizes mastery of techniques such as strikes, kicks, throws, and joint locks. In addition, Jujitsu provides various physical benefits, including improvements in muscular strength, muscular endurance, balance, and other physical components such as agility, speed, coordination, and body composition (Andreato et al., 2017).

Sleep is increasingly recognized as a fundamental component of overall health (Chaput et al., 2016). Good sleep quality encompasses several dimensions, including adequate sleep duration, good sleep efficiency, appropriate sleep timing, and the absence of sleep disturbances (Buysse, 2014). Insufficient sleep, particularly when chronic, is associated with daytime sleepiness, fatigue, mood disturbances, reduced productivity, and increased risks to health and safety (Owens et al., 2014). Furthermore, chronic sleep deprivation has been linked to increased morbidity and mortality, including adverse health outcomes such as obesity, type 2 diabetes, hypertension, cardiovascular disease, depression, and all-cause mortality (Shen et al., 2016; Wang et al., 2015).

In athletic populations, sleep quality plays a critical role in influencing sports performance. Previous studies have shown that modifying sleep-related factors such as sleep duration, room temperature, and lighting conditions can improve sleep quality and subsequently enhance athletic performance (Reynolds et al., 2023). Conversely, poor sleep quality may lead to emotional disturbances, anxiety, impaired immune function, and decreased training and competition performance (Chaput & Dutil, 2016; Fullagar et al., 2015; Ibarra-Coronado et al., 2015; Pires et al., 2016; Tempesta et al., 2018).

Sleep quality is influenced by multiple factors, including physical and environmental factors. Physical factors include dizziness, breathing difficulties, discomfort, fatigue, and insomnia, while environmental factors consist of room temperature, noise, and excessive lighting (Rubio-Arias et al., 2017; Saputra et al., 2019; Yaqin, 2016). Athletes frequently encounter sleep-related challenges due to intensive training and competition schedules, travel demands, psychological stress, academic responsibilities, and overtraining (Turner et al., 2021).

Adequate sleep quality not only helps athletes maintain optimal physical health but also supports psychological readiness, including reducing pre-competition anxiety and enhancing mental preparedness for performance (Andrade et al., 2019, 2021). Therefore, sleep quality should be a key consideration in athlete development programs, particularly in highly competitive sports such as Jujitsu, to optimize performance and achieve

athletic success (Branco et al., 2016; Fullagar et al., 2015).

Globally, sleep disturbances are highly prevalent among athletes. According to a consensus statement from the International Olympic Committee, approximately 49% of Olympic athletes are classified as poor sleepers, while up to 64% report significant insomnia symptoms, highlighting the widespread nature of sleep problems in elite athletic populations (Reardon et al., 2019). Furthermore, research published in the British Journal of Sports Medicine reported that 50–78% of elite athletes experience sleep disturbances, with about 22–26% experiencing highly disturbed sleep, often characterized by insufficient sleep duration, long sleep latency, and daytime fatigue (Walsh et al., 2021). These findings suggest that sleep inadequacy represents a common issue that may negatively affect athlete health, recovery, and performance.

One unique factor that may contribute to sleep disruption in combat sports athletes is weight cutting, a common practice used to meet weight-class requirements prior to competition. Rapid weight reduction strategies including dehydration, caloric restriction, and increased training volume can lead to physiological stress, hormonal disturbances, dehydration, and elevated sympathetic nervous system activity. These physiological changes may interfere with normal sleep patterns, resulting in difficulties initiating sleep, fragmented sleep, and reduced sleep quality. In addition, the psychological pressure associated with making weight and upcoming competition may further increase anxiety and cognitive arousal, which are known contributors to insomnia and poor sleep quality among athletes (Kużdżał et al., 2025).

Despite the growing recognition of sleep as a critical factor in athletic performance, limited research has specifically examined sleep quality in combat sport athletes in Indonesia, particularly among Jujitsu competitors. Understanding sleep patterns in this population is important because athletes competing in weight-class sports may face unique physiological and psychological stressors that influence sleep quality.

Therefore, this study aimed to examine the prevalence and weight-class differences in sleep quality among competitive Jujitsu athletes in Surabaya, Indonesia.

B. Methods

This study employed a quantitative descriptive design using a cross-sectional approach to describe the sleep quality characteristics of Jujitsu athletes in Surabaya. Descriptive research aims to provide an objective and systematic representation of the research object by accurately describing its characteristics and frequency (Zellatifanny & Mudjiyanto, 2018), while quantitative research focuses on measurable phenomena represented as variables (Ali, 2022).

Data were collected using an online questionnaire distributed via Google Form to Jujitsu athletes in Surabaya. The sampling technique used was purposive sampling, involving 56 Jujitsu athletes aged over 16 years from several Jujitsu clubs in Surabaya. The research object focused on assessing the sleep quality of Surabaya Jujitsu athletes. Prior to participation, respondents provided informed consent through an online agreement form. Respondents were asked to complete personal data (name, age, place and date of birth, club/dojo, and body weight), confirm competition experience within the past five years, and report current training activity levels.

The research instrument used was the Pittsburgh Sleep Quality Index (PSQI) questionnaire, which is designed to assess sleep quality and sleep disturbances over a one-month period (Buysse et al., 2016). The PSQI consists of seven components derived from 18 items, including subjective sleep quality, sleep latency, sleep duration, sleep

efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction (Flowerenty, 2015). Data collection was conducted online through closed-ended questionnaires distributed via social media platforms. The PSQI instrument adopted in this study refers to the version developed by Hita Contreras (2014). The internal consistency of the PSQI in this study was evaluated using Cronbach's alpha coefficient.

This study was conducted in accordance with ethical research standards and was approved by the Institutional Review Board (IRB) of Universitas Negeri Surabaya. All participants provided informed consent prior to completing the questionnaire, and confidentiality of participant data was strictly maintained.

A power analysis was conducted to determine the minimum required sample size for statistical analysis. Assuming a medium effect size (d = 0.5), a significance level of α = 0.05, and statistical power of 0.80, the minimum required sample size was approximately 50 participants for comparisons between groups. Therefore, the sample size of 56 athletes included in this study met the minimum requirement for adequate statistical power.

Data were analyzed using descriptive and inferential statistical methods. Descriptive statistics were presented as mean ± standard deviation (Mean ± SD). The reliability of the PSQI questionnaire was assessed using Cronbach's alpha coefficient.

Inferential analysis was conducted to examine differences in sleep quality across athlete characteristics. An independent samples t-test was used to compare sleep quality between male and female athletes. A one-way analysis of variance (ANOVA) was used to evaluate differences in sleep quality across different weight classes. Statistical significance was set at $p < 0.05$, and results were reported with 95% confidence intervals (95% CI). Effect sizes were calculated using Cohen's d for t-tests and eta squared (η^2) for ANOVA to determine the magnitude of observed differences.

C. Result and Discussion

The analysis revealed that among 56 Jujitsu athletes in Surabaya, 17 athletes (30.4%) demonstrated good sleep quality (PSQI < 5), while 39 athletes (69.6%) were classified as having poor sleep quality (PSQI > 5). These findings indicate that the majority of Jujitsu athletes experience sleep disturbances or reduced sleep quality.

Among male athletes, poor sleep quality was most prevalent in the lighter weight classes, particularly in the −56 kg (80%) and −62 kg (63.7%) categories. In contrast, athletes competing in the −69 kg class predominantly demonstrated good sleep quality (60%), and a similar pattern was observed in the 77+ kg class, where 80% of athletes reported good sleep quality. These findings suggest a tendency toward better sleep quality in higher weight classes among male athletes.

Among female athletes, sleep quality also appeared to be relatively poor across weight classes. All athletes competing in the −48 kg and −57 kg weight classes (100%) were classified as having poor sleep quality. In the −63 kg class, only 28.6% of athletes demonstrated good sleep quality, while the majority still experienced poor sleep quality. These results suggest that female athletes, particularly those competing in lighter weight categories, may be vulnerable to sleep disturbances.

However, when overall PSQI scores were compared between male and female athletes, no statistically significant difference was observed. Male athletes demonstrated slightly higher PSQI scores than females (Mean difference = 0.40, 95% CI [−1.01–1.81], p = .57, Cohen's d = 0.15), indicating a small and non-significant effect.

Table 1. Sample Characteristics

Characteristics	Category	n	%
Age (Year)	16–20	42	75.0
	21–25	14	25.0
Weight Class (Kg)			
Male	-56 Kg	10	17.8
	-62 Kg	11	19.6
	-69 Kg	5	8.9
	-77 Kg	5	8.9
	77+ Kg	5	8.9
Female	-48 Kg	6	10.7
	-57 Kg	7	12.5
	-63 Kg	7	12.5
Total		**56**	**100**

Overall, these findings highlight the need for greater attention from coaches, sports officials, and athletic administrators to improve sleep management strategies among athletes. Interventions such as sleep education, improved recovery protocols, and monitoring of weight management practices may be particularly important for athletes competing in lighter weight classes.

Table 2. Distribution of Sleep Quality Categories Based on the number of N in each body weight class in percent units

Characteristics	Good Category (<5)		Poor Cathegory (>5)		N	PSQI	
	Frequency	Percentage	Frequency	Percentage		Mean (SD)	95% CI for M
Male							
-56 Kg	2	20%	8	80%	10	6.8 ± 2.9	4.9 - 8.6
-62 Kg	4	36,3%	7	63.7%	11	7 ± 2.5	5.5 - 8.6
-69 Kg	3	60%	2	40%	5	8.2 ± 4.6	4.1 - 12.2
-77 Kg	2	40%	3	60%	5	5.8 ± 3.3	2.8 - 8.7
77+ Kg	4	80%	1	20%	5	5.2 ± 2.1	3.2 - 7.1
Female							
-48 Kg	0	0%	6	100%	6	7.8 ± 1.6	6.5 - 9.1
-57 Kg	0	0%	7	100%	7	7.1 ± 1.4	5.1 - 8.3
-63 Kg	2	28,6%	5	71,4%	7	6.8 ± 3.1	4.5 - 9.1
Total	17	30,4%	39	69,6%	56	6.8 ± 2.6	4.5 - 8.9

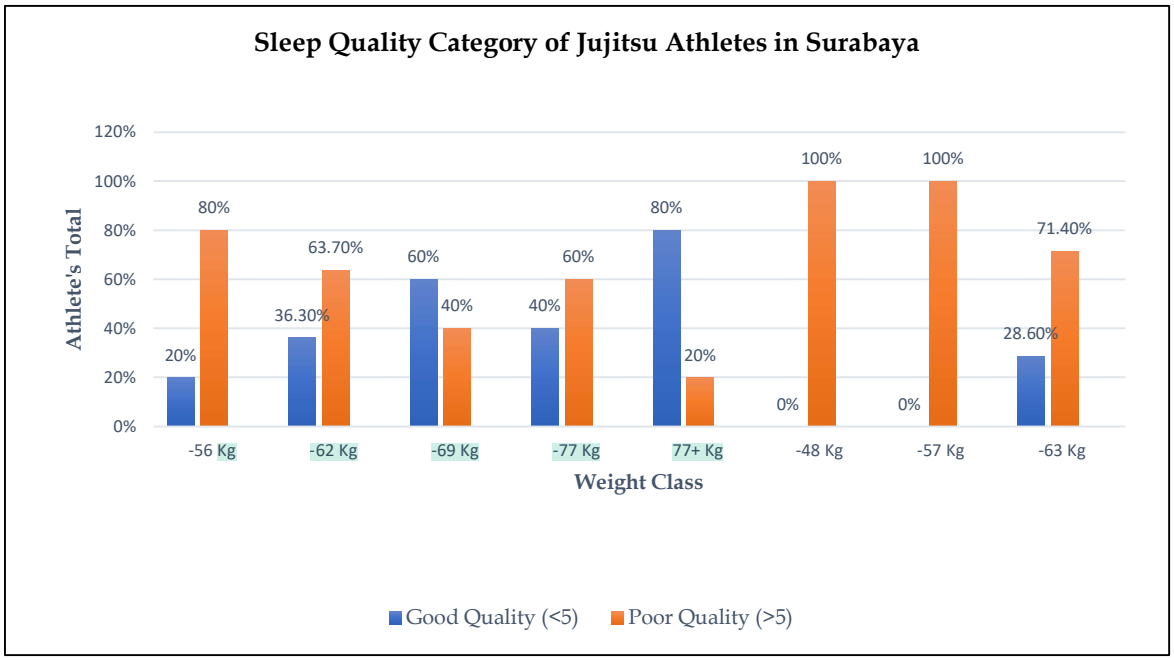

Figure 1. Chart of Sleep Quality Categories of Jujitsu Athletes in Surabaya

Discussion

Based on the Pittsburgh Sleep Quality Index (PSQI), a score of <5 indicates good sleep quality, whereas a score >5 reflects poor sleep quality (Hita-Contreras et al., 2014). The results showed that 30.4% of the 56 respondents had good sleep quality, while 69.6% were classified as having poor sleep quality. Sleep quality is defined as a condition in which individuals feel refreshed and physically fit upon awakening (Watson, 2017). Poor sleep quality may disrupt physiological and psychological balance and, in the long term, may contribute to serious health consequences, including increased mortality risk (Apriantono et al., 2020).

The descriptive analysis revealed a mean PSQI score of 6.9, exceeding the established cutoff (>5), indicating that the majority of Jujitsu athletes in Surabaya experience poor sleep quality. This finding is consistent with previous research reporting that PSQI scores above 5 indicate clinically relevant sleep disturbances (Vieira, n.d.). Studies published in the journal *Sleep* have also reported that athletes frequently experience inadequate sleep duration and reduced sleep efficiency, particularly during periods of intensive training or competition schedules, which can impair physical recovery and cognitive performance (Watson, 2017).

When analyzed by weight category, male athletes in the −56 kg class exhibited the poorest sleep quality, followed by the −62 kg class. Most athletes in these categories were students, suggesting that academic demands may contribute to sleep disturbances (Astridge et al., 2021). Improved sleep quality was observed in the −69 kg and −77 kg classes, while the 77+ kg class showed the highest proportion of good sleep quality. This may be attributed to differences in occupational status, as many athletes in heavier weight classes had completed formal education and were already employed. Research indicates that athletes with higher training loads and additional academic or occupational responsibilities often experience reduced sleep duration and increased fatigue, which

may negatively affect recovery and performance (Walsh et al., 2021).

Among female athletes, PSQI scores were generally high across all weight categories, indicating poor sleep quality. The highest scores were observed in the −48 kg and −57 kg classes, with no athletes classified as having good sleep quality. In contrast, the −63 kg class showed a relatively higher proportion of good sleep quality. Age and occupational factors may contribute to these differences, as athletes in the lighter female weight classes were generally older and employed, whereas those in the −63 kg class were younger and predominantly high school students. Overall, these findings indicate that female athletes are particularly vulnerable to poor sleep quality. Previous studies in *Sports Medicine* have reported that female athletes may experience greater sleep disturbances due to hormonal fluctuations, psychological stress, and higher sensitivity to environmental and training stressors (Elkins, 2024).

One factor that may contribute to sleep disturbances in combat sport athletes is weight cutting, a common practice used to meet weight-class requirements prior to competition. Rapid weight loss strategies including dehydration, caloric restriction, and increased training intensity can lead to sleep restriction and physiological stress, which may disrupt normal sleep patterns (Dunican et al., 2019). Research suggests that rapid weight loss may impair sleep quality through metabolic stress, dehydration, and increased sympathetic nervous system activity (St-Onge et al., 2016). In addition, weight cutting may contribute to hormonal disruption, including alterations in cortisol, testosterone, and growth hormone levels, which play critical roles in recovery, muscle repair, and circadian regulation (Vitale et al., 2019).

Another potential explanation for poor sleep quality among athletes is overtraining syndrome, a condition characterized by excessive training loads combined with insufficient recovery. Athletes experiencing overtraining often report chronic fatigue, mood disturbances, and sleep problems (Symons et al., 2023). Studies shown that prolonged training stress without adequate recovery may dysregulate the hypothalamic–pituitary–adrenal (HPA) axis, leading to elevated cortisol levels and disrupted sleep patterns. This hormonal imbalance can further impair immune function, increase injury risk, and reduce athletic performance (Campbell et al., 2021).

The dual burden of academic and athletic responsibilities may also contribute to sleep disturbances among student-athletes. Most respondents in this study were aged 16–20 years, a developmental period characterized by intensive academic demands, social activities, and athletic commitments (Grandner et al., 2021). Previous research in the journal *Sleep* has shown that student-athletes frequently experience sleep restriction due to late-night studying, early training sessions, and academic stress. This "academic-athlete dual burden" may lead to chronic sleep deprivation, reduced recovery capacity, and impaired cognitive functioning (Sun et al., 2023; Turner et al., 2021).

Insomnia emerged as a common sleep disturbance among respondents, characterized by difficulty initiating or maintaining sleep. The most frequently reported complaint was physical discomfort, which caused restlessness, difficulty sleeping deeply, and frequent nighttime awakenings (Snyder et al., 2018). Physical symptoms such as itching, muscle cramps, and body pain further disrupted sleep and contributed to reduced sleep satisfaction (Kaaz et al., 2018).

Environmental factors also played a significant role in sleep disturbances. Noise and excessive lighting were identified as major external factors affecting sleep quality. Noise may trigger stress responses, while excessive light exposure can suppress melatonin production, thereby disrupting circadian rhythms (Lu et al., 2024).

Overall, these findings indicate that the majority of Jujitsu athletes in Surabaya both male and female experience poor sleep quality. This issue warrants serious attention, as inadequate sleep may impair physiological recovery, training performance, and immune function. Non-pharmacological interventions, including sleep schedule regulation, stress management, recovery monitoring, and post-training relaxation strategies, are strongly recommended to improve athletes' sleep quality (Saputra et al., 2019). In addition, coaches and sports organizations should consider implementing sleep education programs and monitoring weight-management practices to minimize the negative effects of weight cutting and excessive training load on athletes' sleep and overall health.

D. Conclusion

Based on the findings of this study, it can be concluded that the sleep quality of Jujitsu athletes in Surabaya is predominantly poor. The majority of athletes demonstrated PSQI scores above the recommended threshold, indicating the presence of sleep-related problems that may negatively affect physiological recovery, training performance, and competitive outcomes.

From a scientific perspective, this study contributes to the growing body of literature on sleep in combat sport athletes by providing empirical evidence on the prevalence of poor sleep quality and its distribution across weight categories among competitive Jujitsu athletes in Indonesia. These findings enrich the limited regional data on athlete sleep patterns and highlight the importance of sleep as a key component of athlete health, recovery, and performance optimization.

From a policy and practical perspective, the findings underscore the need for sports organizations, training centers, and coaching staff to integrate sleep management strategies into athlete development programs. Educational initiatives focusing on sleep hygiene, recovery management, and balanced training loads should be implemented to help athletes maintain adequate sleep quality. Particular attention should be given to athletes aged 16–20 years, who often experience the combined demands of academic responsibilities and intensive training schedules.

For future research, further studies are recommended to investigate sleep quality among athletes in different training environments with larger and more diverse samples to provide broader comparative insights. In addition, future quantitative experimental studies are needed to evaluate the effectiveness of sleep-focused interventions. Such as sleep education programs, recovery protocols, and training load adjustments in improving sleep quality and athletic performance among combat sport athletes.

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F. Conflict of Interest

The author declares that there are no conflicts of interest associated with the

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