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PREVALENCE AND RISK FACTORS FOR SLEEP QUALITY DISORDERS IN *PENCAK SILAT* ATHLETES BULELENG REGENCY

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ABSTRACT

Background. The quality of sleep-in athletes contributes to athletic performance, injury risk, recovery time, cardiovascular endurance and anaerobic strength. *Pencak silat* athletes also have a risk of having poor sleep quality, in connection with the intensity of training and academic stress in athletes who are students. However, specific data on the prevalence and risk factors for sleep quality disorders in athletes are still limited. This study is aimed at determining the quality of sleep and factors related to *pencak silat* athletes. **Methods**. A cross-sectional study conducted on *pencak silat* athletes in Buleleng Regency in June-August 2025. A total of 32 *pencak silat* athletes participated in this research, who were selected using the total sampling method. The criteria for sample inclusion set include being willing to be the subject of the research, and signing the informed consent, being present at the data collection, being able to fill out the questionnaire completely and participating in the data collection until the end. The exclusion criteria in this study are athletes in poor physical and mental health, who are diagnosed by a doctor, and have moved their domicile outside Buleleng. Sleep quality data were collected by the interview method using the Pittsburgh Sleep Quality Index (PSQI) questionnaire. **Result**. As many as 59.4% of *pencak silat* athletes have good sleep quality. Early wake-up time, the use of sleep medications, the presence of sleep disorders and sleep efficiency are factors related to the quality of athletes' sleep ($p < 0.05$). **Conclusion.** Therefore, it can be concluded that the sleep quality of *pencak silat* athletes is quite good. So, it is recommended to increase adequate sleep time supervision between 8-10 hours per day, avoid the use of sleeping pills and overcome sleep disorders in athletes to maintain athlete performance.

Keywords: Athletes, cross-sectional, *pencak silat*, Pittsburgh Sleep Quality Index, sleep quality.

INTRODUCTION

Sleep is an essential component in the physical and mental recovery of athletes, as it plays an important role in the process of muscle tissue regeneration, motor memory consolidation, hormone regulation, and maintenance of cognitive functions such as concentration, decision-making, and quick reactions.[1] Lack of sleep quality can decrease athletic performance, increase the risk of injury, prolong recovery time, and affect cardiovascular endurance and anaerobic strength.[2]) In athletes in general, the prevalence of sleep disorders is quite high, with sleep duration often less than 7 hours per night and suboptimal sleep quality due to intensive training schedules, competitive trips, and psychological stress.

In combat sports such as judo, taekwondo, karate, and *pencak silat*, sleep quality issues are increasingly complex because the characteristics of these sports involve high-intensity physical exercises, physical contact, and extreme weight loss practices that often interfere and cause dehydration and oxidative stress. Research on *pencak silat* athletes in West Java showed that the prevalence of poor sleep quality reached 78.3% based on the Pittsburgh Sleep Quality Index (PSQI), with major impairments in sleep latency, sleep duration, and daytime dysfunction.[3] A similar study in Mixed Martial Arts (MMA) fighters found high sleep variability during the prep period, where short sleep correlates with decreased physical performance and increased risk of injury. In professional karate athletes compared to amateurs, significant differences were found in sleep quality, with professional athletes tending to have worse PSQI scores due to training loads and heavier competition.

Poor sleep quality in athletes significantly impairs physical performance, cognitive function, and recovery, increasing the risk of injury and reducing overall competitiveness.[4] Acute sleep deprivation leads to a decrease in explosive power, speed, skill control, and moderate to large aerobic endurance, with a worsening effect on afternoon sessions due to accumulated fatigue. Muscle glycogen is depleted faster, and perceived activity

increases, limiting high-intensity efforts such as sprints or intermittent exercise.[5] Chronic poor sleep increases the perception of fatigue, disrupts hormonal balance for muscle repair, and correlates with suboptimal exercise adaptation, affecting long-term progress.[6]

In Indonesia, several local studies have also indicated similar problems in martial arts athletes. In adolescent *pencak silat* athletes, good sleep quality is related to vitamin D intake and optimal stamina, while sleep disorders are often associated with nutritional status and energy adequacy.[7] Studies on kempo athletes in Semarang showed the relationship between poor sleep quality and low levels of physical fitness, as well as the effect of exercise intensity on sleep disorders in general martial artists.[8] Student-athletes are also vulnerable because they have to balance academic demands with practice and competition, which exacerbates risk factors such as stress and excessive screen time before bed.[9]

Pencak silat athletes in Buleleng Regency also have a risk of having poor sleep quality, in connection with the intensity of training and academic stress, considering that athletes are still students. However, specific data on the prevalence and risk factors of sleep quality disorders in athletes are still limited, especially with the use of valid instruments such as PSQI. This understanding is important for the development of sleep hygiene interventions that can improve athletes' performance and long-term health. Therefore, the objective of this research is determine the quality of sleep and factors related to *pencak silat* athletes in Buleleng Regency.

MATERIALS AND METHODS

This study was designed using a cross-sectional approach. Cross-sectional is a study to study the dynamics of the correlation between risk factors and effects, by means of an observational approach or data collection at the same time. Each research subject was observed only once, and measurements were made on the status of the subject's character or variables at the time of examination. The research will be carried out in Buleleng. The data collection period lasted between June- August 2025.

The population of this study is *pencak silat* athletes in Buleleng Regency. A total of 32 athletes were involved in this study, who were selected using the total sampling method. The sample size was calculated using the correlation coefficient formula, the Zα value used = 1.96, Zβ = 0.84, and the r value or expected correlation coefficient = 0.62.

The study subjects were *pencak silat* athletes who were selected using the non-probability total sampling method. The selected athletes have met the sampling criteria. The inclusion criteria set include being willing to be the subject of the research, and signing the informed consent, being present at the data collection, being able to fill out the questionnaire completely and participating in the data collection until the end. The exclusion criteria in this study are athletes in poor physical and mental health, who diagnosed by a doctor, and have moved their domicile outside Buleleng.

This study uses primary data collected using observation and interview methods. Data on sleep quality and age collected using the interview method, while data on height, weight and BMI were collected by observational methods.

Sleep quality measurement in this study used the Pittsburgh Sleep Quality Index (PSQI) questionnaire, which has been adapted into Indonesian. The PSQI questionnaire includes seven components, namely subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disorders, sleep drug use, and daytime dysfunction. Each component has a score range of 0, no matter sleep, to 3 sleep problems. The total scores of the seven components are in the range of 0 to 21.

All respondents were explained the research procedure and were asked to affix their signatures to the consent form to participate in the study. The form submitted before data collection begins. Interviews and observations conducted in the field where the athletes trained. Structured interviews conducted by the researcher himself using a standard questionnaire. Body stiffness measured using a digital scale that has calibrated beforehand. Height measured using microtoise attached to the wall.

The data from the research results analyzed univariate and bivariate. Univariate analysis was conducted to determine the proportion of athletes' sleep quality and the frequency distribution of each variable. Bivariate analysis was conducted with the chi-square test to determine factors related to sleep quality. Sleep quality data is categorized as "good" if the sleep quality score is below 5 and "poor" indicates that the sleep quality score is above 5.

This research has received Ethical Clearance approval from the Ethics Commission of Komisi etik Ganesha University of Education, with ethical number 085/UN.48.16.04/PT/2025, on 13 August 2025.

RESULT

Table 1 illustrates the characteristics of the respondents of *pencak silat* athletes. The average age of the athlete is 13.38±0.8 years with a height of 155.7±7.3 cm and a body weight of 41.2±6.9 kg. Most *pencak silat* athletes are male (68.7%), have no history of disease (90.6%), with a BMI in the underweight category (90.6%)

Table 1. Average distribution and frequency of respondent characteristics (n=32)

Variable	Min	Max	Mean ± SD
Age	11	15	13,38±0.8
Height (cm)	141	173	155.7±7.3
Weight (Kg_	30	60	41.2±6.9
Variable	n	%	
Gender			
Male	22	68.7	
Female	10	31.3	
History of the disease			
Yes	3	9.4	
No Deases	29	90.6	
BMI			
Normal	3	9.4	
Underweight	29	90.6	

Table 2 describes the sleep behavior of *pencak silat* athletes. Most athletes started sleeping at 10:00 p.m. (53.1%), woke up at >7:00 a.m. (62.5%), once a week were unable to fall asleep after 30 minutes of lying down (56.2%), woke up in the middle of the night or early in the morning (56.2%), had trouble breathing properly (18.8%), coughed or wheezed (12.5%), chills at night (40.6%), overheated at night (50.0%), nightmares (56.2%), and waking up in pain (3.1%).

Table 2. Distribution of Frequency of Sleep Behavior in *Pencak silat* Athletes

Indicator	n	%
Usually start sleeping time at night (hours)		
21.00	15	46.9
22. 00	17	53.1
How long it usually takes to fall asleep (minutes)		
< 15	17	53.1
≥ 15	15	46.9
Usually, waking time is Morning (am)		
≤ 07.00	12	37.5
>07.00	20	62.5
Unable to fall asleep after 30 minutes of lying down		
Never	8	25.0
1 time a week	18	56.2
2 times a week	3	9.4
≥3 times a week	3	9.4
Waking up in the middle of the night or early in the morning		
Never	5	15.6
1 time a week	18	56.2
2 times a week	6	18.8
≥3 times a week	3	9.4
Waking up to the bathroom		
Never	8	25.0
1 time a week	12	37.5
2 times a week	9	28.1
≥3 times a week	3	9.4
Difficulty breathing properly		

Never	25	78.1
1 time a week	6	18.8
2 times a week	0	0
≥3 times a week	1	3.1
Coughing or wheezing		
Never	27	84.4
1 time a week	4	12.5
2 times a week	0	0
≥3 times a week	1	3.1
Cold at night		
Never	7	21.9
1 time a week	13	40.6
2 times a week	7	21.9
≥3 times a week	5	15.6
Heat at night		
Never	10	31.2
1 time a week	16	50.0
2 times a week	4	12.5
≥3 times a week	2	6.3
Nightmares		
Never	7	21.9
1 time a week	18	56.2
2 times a week	6	18.8
≥3 times a week	1	3.1
Waking up in pain		
Never	28	87.5
1 time a week	1	3.1
2 times a week	3	9.4
≥3 times a week	0	0
Waking up for other reasons not mentioned above		
Never	24	75.0
1 time a week	5	15.6
2 times a week	2	6.3
≥3 times a week	1	3.1
Using medication to help with sleep for the past month	32	100
Never	32	100
Sleepiness when doing activities during the day for the past month.		
Never	4	12.5
1 time a week	11	34.4
2 times a week	11	34.4
≥3 times a week	6	18.8
Finding it difficult to stay excited about completing activities or work for the past month.		
Never	16	50.0
1 time a week	11	34.4
2 times a week	4	12.5

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≥3 times a week	1	3.1
Sleep duration (hours)		
>7	15	41.7
6-7	15	41.7
5-6	2	5.6

Table 3 shows the proportion of good sleep quality in *pencak silat* athletes of 59.4%. Most athletes felt that the subjective sleep quality was quite good (87.5%), Lat was quite good (84.4%), sleep duration was quite good (41.7%), sleep efficiency was very good (68.8%), sleep disturbances were quite good (68.8%), drug use was very good (43.3%) and dysfunction was quite good (49.9%).

Table 3. Proportion of sleep quality in *pencak silat* athletes

Variable	n	%
Sleep quality		
Good	19	59.4
Poor	13	40.6
Subjective sleep quality		
Excellent	3	9.4
Pretty Good	28	87.5
Somewhat Bad	1	3.1
Sleep Latency		
Excellent	5	15.6
Pretty Good	27	84.4
Sleep duration		
Excellent	15	41.7
Pretty Good	15	41.7
Somewhat Bad	2	5.6
Sleep Efficiency		
Excellent	22	68.8
Pretty Good	9	28.1
Somewhat Bad	1	3.1
Sleep disorders		
Pretty Good	22	68.8
Somewhat Bad	9	28.1
Very bad	1	3.1
Sleeping Pills		
Excellent	18	47.3
Pretty Good	9	28.1
Somewhat Bad	5	15.6
Daytime activity dysfunction		
Excellent	3	9.4
Pretty Good	15	49.9
Somewhat Bad	9	28.1
Very bad	5	15.6

Table 4 shows that the determinants of athletes' sleep quality are morning wake-up time, drug use, the presence of sleep disorders and sleep efficiency ($p < 0.05$). Morning wake-up time at 7:00 a.m. was 0.6 times more likely to experience good sleep quality compared to morning wake-up time at ≤:00 a.m. (AOR= 0.167; 95% CI=0.035-0.801;

p=0.025). The better the use of drugs, the better the tendency to get a good quality of sleep (p <0.05). The better the sleep disturbance and efficiency experienced, also increased the tendency to experience good sleep quality (p< 0.05).

Table 4. Cross-tabulation of sleep quality based on respondent characteristics and sleep quality indicators

Variable	Sleep quality		AOR	95% CI	p
	Good N (%)	Poor N (%)			
Age (years)			-	-	0.487
11-13	14 (70)	6 (30)			
14-15	5 (41.6)	7 (58.4)			
Gender			1.750	0.385-7.951	0.364
Male	14 (63.6)	8 (36.4)			
Women	5 (50)	5 (50)			
BMI			0.306	0.025-3.778	0.356
Normal	1 (33.3)	2 (66.7)			
Underweight	18 (62.1)	11 (37.9			
Usually start sleeping at night (hours)			1.778	0.423-7.467	0.335
21.00	10 (66.7)	5 (33.3)			
22.00	9 (52.9)	8 (47.1)			
Usually waking up time in the morning (time)			0.167	0.035-0.801	0.025*
≤ 07.00	4 (33.3)	8 (66.7)			
>07.00	15 (75.0)	5 (25.0)			
Sleeping Pills			-	-	0.005*
Excellent	15 (83.3)	3 (16.7)			
Pretty Good	4 (44.4)	5 (55.6)			
Somewhat Bad	0 (0)	5 (100)			
Sleep disorders			-	-	0.000*
Good	19 (86.4)	3 (13.6)			
Poor	0 (0)	10 (100)			
Sleep Efficiency			-	-	0.000*
Excellent	19 (86.4)	3 (13.6)			
Pretty Good	0 (0)	9 (100)			
Somewhat Bad	0 (0)	1 (100)			
Sleep Duration			-	-	0.37
Excellent	12 (80)	3 (20)			
Pretty Good	7 (46.7)	8 (53.3)			
Somewhat Bad	0 (0)	2 (100(			
Sleep Latency			3.200	0.315-32.532	0.308
Excellent	4 (80)	1 (20)			
Pretty Good	15 (55.5)	12 (44.5)			
Subjective sleep quality			-	-	0.168
Excellent	3 (100)	0 (0)			
Pretty Good	16 (57.1)	12 (42.9)			
Somewhat Bad	0 (0)	1 (100)			

DISCUSION

The proportion of good sleep quality in *pencak silat* athletes was found to be 59.4%. The results of another study found that the proportion of sleep quality in *pencak silat* athletes varied. The proportion of good sleep quality in *pencak silat* athletes in West Java was found to be 21.7%, lower than the proportion of good sleep quality in *pencak silat* athletes in Buleleng.[3] On the other hand, the proportion of good sleep quality in *pencak silat* athletes at the Satria Muda Indonesia *Pencak silat* College (PPS SMI) Tangerang was found to be 68.7.[7] The proportion of good sleep quality in athletes is generally found at 50%.[10,11] This difference is made possible by the large differences in the sample and the method of data collection carried out. In this study, only 32 samples were used with the total population sampling method, while other studies used a sample of between 46 and 70 athletes with the purposive sampling method. The data in this study were collected by the questionnaire method, while the research conducted in the field was collected by structured interviews.

Differences in sleep quality in *pencak silat* athletes may be influenced by demographic factors, training and competition factors, physiological, psychological, environmental and lifestyle factors.[12] In this study, only demographic factors such as age and gender categories were evaluated, while other factors were not evaluated. Therefore, this study suggests evaluating more determinants of sleep quality in athletes so that they can determine the most dominant factors affecting sleep quality in athletes, especially *pencak silat* athletes.

In this study, it was found that male *pencak silat* athletes tended to have better sleep quality compared to female athletes. The study is in line with a study conducted on athletes in various sports in Tokyo which found that the proportion of good sleep quality in male athletes was 68.6% higher compared to 51.2% for female athletes.[13,14] Differences in sleep quality were also found in *pencak silat* athletes with age variations. Good sleep quality was more common in *pencak silat* athletes with a younger age (11-13 years) of 70% compared to older athletes (14-15 years) of 41.6%. The findings are supported by the results of a study in athletes in China, which found that increasing age per year increases the risk of experiencing poor sleep quality by 1.15 times.[15] The Gospel of Jesus Christ

Based on direct and consistent evidence from *pencak silat* studies and similar combat sports literature, the most significant factors affecting the quality of a *pencak silat* athlete's sleep are post-competition sleep hours, training load (volume/frequency/intensity), and weight loss practices; psychological factors (competitive stress/emotions) also appear relevant due to their association with sleep and injury.[16–18] The *pencak silat* study directly supports the effect of post-competition sleep hours on sleep quality.[19] while cross-sport evidence links training and weight-cutting loads to sleep and recovery disorders.[20]

This study also found that waking up earlier in the day tends to have a better quality of life compared to waking up earlier in the morning. This is possible because waking up early usually reduces total sleep time and leads to fragmented rest. Another study found that athletes often slept 20-30 minutes less before morning workouts, with increased wakefulness and longer sleep times posing a negative risk to recovery, performance, and injury risk.[21,22]

Waking up early forces an earlier bedtime that athletes find difficult to maintain, cutting sleep from 8 hours to as low as 6 hours. Lower sleep correlates with higher fatigue, anxiety, and a worse-perceived recovery the next day. Insufficient sleep from waking up in the morning reduces reaction time, accuracy and mood, hindering exercise results.[23,24] Quality sleep in athletes is 8-10 hours each night by scheduling mid-morning workouts if possible. Napping can compensate for the deficit but does not completely replace the lost night's sleep. So, sleep time monitoring in *pencak silat* athletes needs to be done to improve the achievement of training results.[25]

The study has the drawback of the number of samples used with respect to the limited number of populations. This contributes to the results of the analysis, where the results of the observations are abnormally distributed and the results of the observations get a score below 5. Another disadvantage is the limited risk factors for sleep quality that are evaluated, so it does not provide comprehensive information.

CONCLUSIONS AND SUGGESTIONS

The quality of sleep in *pencak silat* athletes is relatively good, where the proportion of athletes with good sleep quality is 59.4%. Good sleep quality is influenced by early morning waking habits, the use of sleeping pills and low sleep disturbances. The results of this study contribute to policies in maintaining the resilience of athletes to achieve achievements. Therefore, it is recommended to improve the quality of athletes' sleep through adequate monitoring of sleep time between 8-10 hours per day, avoiding the use of sleeping pills and overcoming sleep disorders in athletes.

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