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Sleep Quality and Athletic Performance among Athletes of University of Benin

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Abstract. The purpose of this study was to find out sleep quality and athletic performance among athletes of the University of Benin. Four research questions were raised in this study and four corresponding hypotheses were formulated at 0.05 level of significant. This study adopted correlation research design. The population of this study consisted of 244 student-athletes of the University of Benin, 145 male and 99 female. The sample size of this study was made up of 122 University of Benin student-athletes. The simple random sampling technique of selection without replacement was used to select the sample. The Pittsburg sleep quality index questionnaire was the instrument that was used in this study. It is a 19 item self-report questionnaire, comprising of both fixed choice and open-ended questions, evaluating several aspects of sleep, which included, subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances. Component scores range from 0 (no difficulty) to 3 (severe difficulty) and their sum produces a global score ranging from 0-21, with higher values indicating poorer sleep quality. A PSQI score greater than 5 considered indicative of poorer sleep quality, based on its high sensitivity and specificity in identifying patients with sleep complaints. The data collected were analysed using Pearson product moment correlation coefficient to analysed hypotheses 1 to 4 at 0.05 alpha level. Findings revealed that there is a significant relationship between sleep latency and athletic performance, it was therefore concluded that, there is a significant relationship existing among sleep latency, duration efficiency and athletes' performance in University of Benin. It was therefore recommended that sports managers should incorporate sleep management strategies into their training programs because it is a vital for athletes seeking to optimize both physical and cognitive performance

Keywords: Sleep quality, sleep latency, sleep duration, sleep efficiency, athletes' performance

1. Introduction

High quality sleep, sufficient sleep is often presumed to be necessary for multiple factors contributing to sports performance, such as promoting physical and mental recovery from rigorous training regimens, minimizing the risk of injury and preventing in-game fatigue and lapses in concentration. The term sleep is a naturally recurring state of mind and body, characterized by altered consciousness, inhibited sensory activity and reduced muscle activity (Hirshkowitz et al., 2015). It is a reversible behavioral state of reduced responsiveness to external stimuli and relative inactivity (Nayak & Anikumar, 2023). Sleep quality is defined as an individual's self-satisfaction with all aspects of the sleep experience, such as; sleep efficiency, sleep latency and sleep duration. (Nelson et al., 2022).

According to Singh et.al (2015), sleep efficiency is calculated as the proportion of time spent asleep relative to the time spent in the sleep environment. Athletes typically require more sleep than the average adult due to the physical and mental demands placed upon them. However, the mere number of hours spent in bed does not necessarily equate to high-quality restorative sleep. Studies demonstrate that athletes often report difficulties in initiating and maintaining sleep, thereby diminishing sleep efficiency (Haskell et.al, 2025). This inefficiency can be attributed to factors such as heightened training loads, travel schedules, and stressors related to competition.

The physiological implications of sleep efficiency are profound. Sleep plays a vital role in various restorative processes, including the release of growth hormone (GH) and the synthesis of proteins essential for muscle repair and recovery. Research conducted by Rydzik et al. (2021) indicates that sleep efficiency significantly influences anabolic processes. Athletes with higher sleep efficiency benefited from increased GH release, which is critical for muscle recovery and adaptation to training stimuli. Conversely, those with lower sleep efficiency experienced impaired recovery and diminished muscle synthesis, ultimately impacting their athletic performance.

Moreover, sleep efficiency has an equally significant impact on cognitive functions, which are vital in sports requiring high levels of strategic thinking, decision-making, and reaction time. A study by Dong et.al (2024) pointed out that decreased sleep efficiency primarily impair attention networks and executive function. In high-stakes sporting environments, the ability to make

split-second decisions can mean the difference between victory and defeat. Therefore, optimizing sleep efficiency not only enhances physical capabilities but also sharpens cognitive functions, creating a well-rounded athlete. In addition to the physiological and cognitive aspects, the effects of sleep efficiency on mood and emotional well-being cannot be overlooked. Sleep deprivation and poor sleep quality have been linked to increased levels of stress, anxiety, and depression. Athletes who experience these negative psychological effects are less likely to perform at their peak. The emotional toll of sport can amplify the consequences of inadequate sleep; thus, maintaining high sleep efficiency is paramount for psychological resilience. Nevertheless, despite the overwhelming evidence advocating for the importance of sleep efficiency, many athletes struggle to prioritize their sleep needs. Factors such as busy training schedules, recovery demands, and social obligations often lead athletes to compromise on their sleep durations and quality. This scenario is troubling, as evidenced by research indicating a trend of sleep inadequacy among elite athletes (Walsh, et.al, 2021). It is essential for athletes, coaches, and sports organizations to recognize these challenges and implement strategies to promote better sleep hygiene

On the other hands sleep latency, is the time it takes to fall asleep after going to bed. Sleep latency is a crucial aspect of sleep quality and has a significant impact on athletic performance. Athletes who can fall asleep quickly and efficiently are more likely to experience improved sleep quality and athletic performance. By establisShing a consistent sleep schedule, creating a sleep-conductive environment, avoiding stimulating activities before bedtime and practicing relaxation techniques, athletes can improve their sleep latency and optimize their sleep quality and athletic performance. According to Bourdon et al (2017) posited that for athletes, impaired sleep can result in increased perception of effort, reduced motivation, and altered pain sensitivity, compromising their training efficiency and readiness during competitions. Mah et al (2018) suggested that sleep is essential for memory consolidation, where motor skills learned during the day are reinforced and stored, thereby enhancing performance.

More so, sleep duration, refers to the amount of time an individual spends sleeping each night. For athletes, the national sleep foundation recommends 7- 9 hours of sleep per night for optimal performance and recovery. Sleep duration is a crucial component of sleep quality and has a significant impact on athletic performance. Athletes who prioritize sleep duration and quality can optimize their physical and cognitive performance, reduce their risk of injury and gain competitive edge in any sport of their choice. According Lastella et al. (2016) inadequate sleep adversely affects metabolic functions, immune responses, and muscle repair mechanisms, thereby contributing to decreased physical performance. Mah, et al (2018) examined collegiate basketball players over a period of two weeks, revealing that extended sleep duration averaging ten hours per night was positively correlated with improved sprinting and shooting accuracy, as well as heightened overall mood, noting that poor sleep can result in decreased physical performance capabilities and increased perceived exertion during physical activities. Thus, establishing a consistent sleep routine helps regulate circadian rhythms, enabling quicker sleep onset and improved sleep duration.

According to Scott et al. (2021), Sleep quality being critical for cognitive function and emotional regulation, suggesting sleep quality can lead to negative consequences on mental health. Scott etal maintained that 27.8% of athletes reported poor sleep quality. Swinbourne etal (2016) found that 50% of elite athletes were poor sleepers, as defined by a Pittsburgh Sleep Quality Index (PSQI) score greater than 5. The prevalence of poor sleep quality among university students in Africa varies by region, with the highest rates in South Africa (69.59%), followed by North Africa (62.23%), followed by East Africa (61.31%) and West Africa (54.43%) (Nakie et al., 2022).

Athletic performance is the ability to achieve specific goals in sport through a combination of strength, speed, endurance and skill. (Smith, 2006). Athletic performance is viewed as a complex task that relies on cognitive and motor processes such as decision-making, attention, coordination of complex actions and incorporating feedback (Haehl and Beckmann, 2022). It is also the result of training, skill development and mental preparation, indicating that preparation and mindset play crucial roles in achieving peak performance (Zachary, 2017). There is a strong positive association between sleep and athletic performance including sports-specific skill execution, strength, and anaerobic power (Walsh et al., 2021). Good quality sleep is essential for good health and well-being (Aminoff et al., 2019). However, lifestyle and environmental factors are increasingly causing difficulties in sleeping. Sleep is essential to optimal health and performance especially in athletes (Walsh et.al, 2020). Thus, athletes and coaches recognize the relevance of sleep for supporting performance and recovery. The timing to preferred sleep and wake times affects the circadian rhythm which affect sleep duration and quality and may affect athletic performance (Charest and Grandner, 2023) There is a strong connection between lack of sleep and accuracy as well as reaction time in sports like golf, dart throwing and tennis (Schwartz and Simon, 2015). Cognitive performance and the ability to learn are crucial to both athletic performance and development, and adequate sleep is required to reinforce learned material. Restricted sleep can hinder an athlete's athletic capacity by impairing new skill acquisition as well as interfering with flexible thinking and decision-making (Bird, 2013).

1.1 Research Questions

The following research questions were raised to guide the study:

- What is the relationship between sleep quality and athletic performance any athletes of University of Benin.
- What is the relationship between sleep efficiency and athletic performance among athletes of University of Benin.
- What is the relationship between sleep latency and athletic performance among athletes of University of Benin.
- What is the relationship between sleep duration and athletic performance among athletes of University of Benin.

1.2 Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance:

- There is no significant relationship between sleep quality and athletic performance among athletes of University of Benin.
- There is no significant relationship between sleep efficiency and athletic performance among athletes of University of Benin.
- There is no significant relationship between sleep latency and athletic performance among athletes of University of Benin.
- There is no significant relationship between sleep duration and athletic performance among athletes of University of Benin.

2. Methodology

This study adopted correlation research design. The population of this study consisted of 244 student-athletes of the University of Benin, 145 male and 99 female. The sample size of this study was made up of 122 University of Benin student-athletes. The simple random sampling technique of selection without replacement was used to select the sample. The Pittsburg sleep quality index was the instrument that was used in this study. It is a 19 item self-report questionnaire, comprising of both fixed choice and open-ended questions, evaluating several aspects of sleep, which included, subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances. Component scores range from 0 (no difficulty) to 3 (severe difficulty) and their sum produces a global score ranging from 0-21, with higher values indicating poorer sleep quality. A PSQI score greater than 5 considered indicative of poorer sleep quality, based on its high sensitivity and specificity in identifying patients with sleep complaints. The data collected were analysed using Pearson product moment correlation coefficient to analysed hypotheses 1 to 4 at 0.05 alpha level.

3. Presentation of Results

Hypothesis 1: There is no significant relationship between sleep quality and athletic performance.

Table 1: Pearson correlation statistics on relationship between sleep quality and athletic performance

Variables	N	Mean	SD	r-value	p-value	Decision
Sleep quality		52.42	3.809			
	122			0.518	0.000	Ho is rejected
Athletic performance		78.13	8.553			

The data in table 1 showed the r-value is 0.518 indicating there was a positive moderate relationship between sleep quality and athletic performance. The p-value of 0.000 which is less than 0.05 level of significance shows that the null hypothesis which states that there is no significant relationship between sleep quality and athletic performance is rejected.

Hypothesis 2: There is no significant relationship between sleep efficiency and athletic performance.

Table 2: Pearson correlation statistics on relationship between sleep efficiency and athletic performance

Variables	N	Mean	SD	r-value	p-value	Decision
Sleep efficiency		51.45	4.322			
	122			0.618	0.000	Ho is rejected
Athletic performance		78.13	8.553			

The data in table 2 showed the r-value is 0.618 indicating there was a positive moderate relationship between sleep efficiency and athletic performance. The p-value of 0.000 which is less than 0.05 level of significance shows that the null

hypothesis which states that there is no significant relationship between sleep efficiency and athletic performance is rejected. It therefore suggestive that, there is a significant relationship between sleep efficiency and athletic performance. This implies that sleep efficiency influences athletic performance.

Hypothesis 3: There is no significant relationship between sleep latency and athletic performance.

Table 3: Pearson correlation statistics on relationship between sleep latency and athletic performance

Variables	N	Mean	SD	r-value	p-value	Decision
Sleep latency			4.187			
		51.34				
	122			0.373	0.000	Ho is rejected
athletic performance		78.13	8.553			

The data in table 3 showed the r-value is 0.373 indicating there was a positive weak relationship between sleep latency and athletic performance. The p-value of 0.000 which is less than 0.05 level of significance shows that the null hypothesis which states that there is no significant relationship between sleep latency and athletic performance is rejected. Hence, there is a significant relationship between sleep latency and athletic performance.

Hypothesis 4: There is no significant relationship between sleep duration and athletic performance.

Table 4: Pearson correlation statistics on relationship between sleep duration and athletic performance.

Variables	**N**	**Mean**	**SD**	**r-value**	**p-value**	**Decision**
Sleep duration			3.770			
		52.27				
	122			0.294	0.001	Ho is rejected
Athletic performance		78.13	8.553			

The data in table 4 showed the r-value is 0.294 indicating there was a positive weak relationship between sleep duration and athletic performance. The p-value of 0.000 which is less than 0.05 level of significance shows that the null hypothesis which states that there is no significant relationship between sleep duration and athletic performance is rejected. Hence, there is a significant relationship between sleep duration and athletic performance.

4. Discussion of Findings

The findings in hypothesis one showed that there was a significant relationship between sleep quality and athletic performance. In line with this, quality sleep has been linked to improved attention, decision-making, and reaction times, which are pivotal components in sports (Nedelec, 2020). Conversely, the effects of poor sleep may contribute to increased risk of injury or delayed recovery after injury in athletes (Dwivedi, et.al, 2019). Hausswirth and Mujika (2016) noted that athletes often experience sleep deficits due to rigorous training schedules, travel, and competition-related stress. This lack of sleep can negatively impact their performance, recovery, and overall well-being. Also in consonance with the finding was the study by Kölling, et.al (2022) who identified a direct relationship between sleep quality and mood states in athletes, emphasizing how emotional regulation fosters a positive performance environment. Additionally, a study by Pires et al. (2016) shows that sleep deprivation and poor sleep quality have been linked to increased levels of stress, anxiety, and depression. Athletes who experience these negative psychological effects are less likely to perform at their peak. Reilly and Edwards (2020) posited that athletes who experience disrupted sleep may struggle with concentration and focus during critical moments of competition, leading to inferior performance outcomes. This indicated that, even a modest reduction in sleep quality can impair cognitive functioning and performance efficacy.

The findings of research question 2 in relation to hypothesis 2 revealed that there was a significant relationship between sleep efficiency and athletic performance. As regards this, it is noteworthy that sleep plays a vital role in various restorative processes, including the release of growth hormone (GH) and the synthesis of proteins essential for muscle repair and recovery. Research conducted by Rydzik et al (2021) indicated that sleep efficiency significantly influences these anabolic processes. Athletes with sleep efficiency benefited from increased GH release, which is critical for muscle recovery and adaptation to training stimuli. Conversely, those with lower sleep efficiency experienced impaired recovery and diminished muscle synthesis, ultimately impacting their athletic performance. In addition, studies demonstrated that athletes often report difficulties in initiating and maintaining sleep, thereby diminishing sleep efficiency (Reilly et al, 2019). This inefficiency can be attributed to factors such as heightened training loads, travel

schedules, and stressors related to competition (Watson & Preedy, 2017).

The findings in hypothesis 3 showed that there was a significant relationship between sleep latency and athletic performance. The findings aligned with Bourdon et al (2017) noted that athletes impaired sleep can result in increased perception of effort, reduced motivation, and altered pain sensitivity, compromising their training efficiency and readiness during competitions. Mah et.al (2018) suggested that sleep is essential for memory consolidation, where motor skills learned during the day are reinforced and stored, thereby enhancing performance.

The finding of hypothesis 4 showed that there was a significant relationship between sleep duration and athletic performance. Aligning with this is Lastella et al. (2016) demonstrated that inadequate sleep adversely affects metabolic functions, immune responses, and muscle repair mechanisms, thereby contributing to decreased physical performance. In conformity with this finding was another study by Mah et al (2018) examined collegiate basketball players over a period of two weeks, revealing that extended sleep duration averaging ten hours per night was positively correlated with improved sprinting and shooting accuracy, as well as heightened overall mood. This finding aligned with Lastella et al. (2016), poor sleep can result in decreased physical performance capabilities and increased perceived exertion during physical activities. Thus, establishing a consistent sleep routine helps regulate circadian rhythms, enabling quicker sleep onset and improved sleep duration

5. Conclusion

Based on the findings of the study, it was therefore concluded that, there is a significant relationship existing among sleep latency, duration, efficiency and athletes' performance in University of Benin.

6. Recommendations

Based on the conclusion of the study, the following recommendations were made:

- Student athletes can use technological devices capable of tracking sleep duration and quality can provide insights that facilitate better recovery strategies, ensuring that athletes receive adequate rest tailored to their individual needs.
- Handlers of student-athletes should ensure to optimize sleep efficiency as it not only enhances physical capabilities, but also sharpens cognitive functions, creating a well-rounded athlete.
- Sports managers should incorporate sleep management strategies into their training programs because it is a vital for athletes seeking to optimize both physical and cognitive performance.
- Athletes should maintain a consistent sleep schedule, minimizing exposure to screens before bedtime, and creating a comfortable sleep environment devoid of disturbances.

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