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Sleep Disturbance and its Associated Risk Factors among Pakistani Athletes

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Abstract

Sleep is increasingly being an integral part of a training routine rather than a stagnant state of inactivity, and as a controllable factor that can modify performance for elite athletes. Athletes report high rates of sleep disturbance especially during intense workloads which directly affects athletic performance and may predispose individuals to injury. This study aimed to evaluate the quality of sleep and the various risk factors associated with it among Pakistani athletes.

From February to April 2020, a cross-sectional, multi-center study was conducted involving athletes aged 18 and up, of either gender, from various cities in Pakistan... A validated Urdu version of the Pittsburgh sleep quality index (PSQI) instrument was used to identify sleep quality.

Out of 205 participants**,** n=84 athletes were bad sleepers based on PSQI score. Of whom, the majority were males n=75 (89.3%), and having age group of 18-30 years n=71 (84.5%). Binary logistic regression demonstrated no statistically significant association between any of the factor and PSQI score.

The study found a disturbing quality of sleep in a considerable number of athletes. Therefore, interventions should be done to improve sleep quality so that the performance of the athletes can be improved.

Keywords: Sleep disturbance, Athletes, PSQI, Pakistan

Introduction

Sleep is a fundamental requisite for human health and serves critical psychological and physiological functions [1]. To sustain the most favorable health and functioning, adults should meet at least 7 hours of sleep every night [2]. Adults need 7 to 9 hours of sleep for optimum output and wellbeing, according to the American Academy of Sleep Medicine, whereas teenagers need more sleep, ideally between 8 and 10 hours [3, 4]. From a metabolic point of view, Obesity and diabetes have been attributed to sleep deprivation [5]. Sleep deprivation can lead to excessive food cravings and glucose sensitivity issues, which can lead to impaired glycogen repletion and affect appetite, food intake, and protein synthesis [6]. Growth hormone and cortisol secretion are also impaired by lack of sleep [7]. Sleep period can also be influenced by biological and psychosocial factors, daily activities, and behaviors [8].

For athletes who work intensely regularly, sleep is crucial for mental and physical recovery.[9] Athletes with insufficient sleep quality and quantity can experience a drop in physical performance (such as sudden strength and endurance), a decrease in cognitive performance (such as attention and memory), and an increased risk of illness or injury.[11]. Sleep and mood states have a significant relationship, and both of these aspects have a significant impact on an athlete's athletic success. [12]. According to study [13], sleep has a clear relationship with mood and athletic performance. The connection between sleep quality, mood, and athletic performance has been proven in recent research. [14 – 17.] Coaches and players have long understood the value of sleep in their training, competition, and recovery. [18] Increased sleep duration and quality in athletes are related to improved performance and competition results, according to growing evidence. Sleep is a vital part of the recovery and adaptation process between bouts of exercise.[19].

Exercise is thought to lead to better sleep quality and a longer sleep period in general [20.] Overtraining, on the other hand, is likely to raise arousal levels and disrupt sleep [21.] Overtraining, on the other hand, has been linked to sleep disturbances in athletes [22,] and those who exercise early in the morning get less sleep [23]... Athletes may require more sleep than non-active people to allow for

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sufficient recovery and adaptation between bouts of exercise, probably requiring closer to 9 to 10 hours of sleep rather than the 7 to 9 hours recommended for adults [24.] According to Milewski et al., people who slept less than 8 hours per night were 70% more likely to report an accident than those who slept more than 8 hours per night. [25].

Athletes who are sleep deprived may have diminished brain function, which may influence judgment and/or decision-making at any point during their athletic career. [26]. Sleep quality is most vulnerable before major sporting events, during times of high-intensity training, and after long travel for competitions, and elite athletes often show compromised sleep measures and quality. [27]. Compromised sleep measures and/or quality may be harmful to the outcome of the recovery process after training and competition [27]. Athletes who get less than the recommended amount of sleep a day (less than 8 hours) have been found to have poor athletic results [17]. According to a study on precompetitive sleep behavior in athletes, the majority slept less than 8 hours and 70% recorded poorer sleep quality than average, owing to mood and anxiety disturbances before the competition. [13]. Besides, as compared to age and sex-matched test subjects, Olympic athletes had poorer sleep quality in terms of sleep effectiveness and sleep crumbling [9].

Scope of the Study

In Pakistan, less research work has been done on recovery for athletes during training, which has a great impact on the performance of athletes. This study will help the athletes and coaches to concentrate on this factor and will help them to enhance their performance.

Objective of the Study

- To examine sleep disturbance and its effects on the performance of athletes in Pakistan

Material and Methods

From February to April 2020, a cross-sectional, multi-center study was conducted among different athletes in different cities across Pakistan.

Research Design

A cross-sectional, multi-center study was conducted among different athletes in different cities across Pakistan. Athletes >18 years of age, of both genders, doing regular training and willing to participate in this research.

The study's goal was clarified to athletes. Those who wanted to take part in the study offered written informed consent. After that, participants were asked to complete a demographic questionnaire as well as the Urdu version of the Pittsburgh Sleep Quality Index (PSQI).

Sample of the study

The population for this study comprises athletes of different games from across Pakistan was selected. The total number of responses received was 200.

Instruments used

Baseline demographic questionnaire

Gender, age, educational status, employment status, city of residence, and game were all collected using this questionnaire.

Urdu version of (PSQI) Pittsburgh sleeps quality index The researchers used a validated Urdu version of the Pittsburgh sleep quality index (PSQI) instrument 28 to examine self-reported sleep quality over the previous month. It included "19 products, which were combined with seven component ratings, including subjective sleep quality, sleep latency, sleep length, habitual sleep performance, sleep disturbances, use of sleep medication, and daytime dysfunction." The total score was calculated by adding the scores from these seven elements, which ranged from 0 to 21. Sleepers with a PSQI score of more than 5 were labeled as bad, whereas those with a score of less than 5 were labeled as good.

Statistical analysis

The Statistical Package for Social Sciences version 21.0 was used to analyze the data (SPSS Inc., Chicago, IL). The number and frequency of categorical variables were presented. The Independent T-test and the ANOVA test were used to look at the relationships between categorical variables. Binary logistic regression was employed to study associations of different characteristics with sleep quality assessed via PSQI. P-value < 0.05 was considered significant.

Results

A total of n=230 athletes were approached out of whom n=205 athletes filled the questionnaire having a response rate of 89.1%. Among n=205 athletes, the majority were males n=186 (90.7%) and n=173

(84.4%) were of the age group of 18-30 years, respectively. Among the athletes, n=78 (38.0%) were master's degree holders, and most of them n=95 (46.3%) were unemployed. Athletes from different cities of residence and games participated in this study of whom the majority were from Peshawar n=44(21.5%) (Details are shown in table 1).

Table 1: Demographics of participants n=205

Statement	N (%)
Gender	
Female	19 (9.3)
Male	186 (90.7)
Age	
18-30 years	173 (84.4)
31-40 years	25 (12.2)
41-50 years	7 (3.4)
Education status	
Secondary school	21 (10.2)
Higher secondary school	45 (22)
Bachelor	61 (29.8)
Master	78 (38)
Employment status	
Unemployed	95 (46.3)
Government employee	49 (23.9)
Private employee	46 (22.4)
Self-employee/Own business	15 (7.3)
City of residence	
Peshawar	44 (21.5)
Islamabad	34 (16.6)
Mardan	34 (16.6)
Mian Chanu	27 (13.2)
Faisalabad	16 (7.8)
Lahore	15 (7.3)
Multan	10 (4.9)
Swat	8 (3.9)
Karachi	4 (2)
Nowshera	3 (1.5)
Bannu	3 (1.5)
Kohat	2 (1)
Abbottabad	2 (1)
Swabi	1 (0.5)
Sargodha	1 (0.5)
Bahawalpur	1 (0.5)
Game	
Athletics	205 (100)

The majority of the athletes, n=88 (42.9 percent), said they slept 6-7 hours, with n=47 (22.9 percent) saying they slept 5-6 hours. In the PSQI components score, the majority of the athletes (n=107 (52.2%)) had mild difficulty with sleep latency, while n=144 (70.25%) had mild difficulty with daytime dysfunction... N=134 (65.4%) of athletes reported having relatively good sleep quality, and n= 202 (98.5%) of our athletes had never used sleep medications. The athletes' average PSQI

score was 4.50 3.12 with a mean and standard deviation of 3.12. (As shown in table 2).**Table 2: Component score of PSQI n=205**

Components of PSQI	Responses	N (%)
Sleep duration	> 7 hours	24 (11.7)
	6-7 hours	88 (42.9)
	5-6 hours	47 (22.9)
	<5 hours	46 (22.4)
Sleep disturbances	00	23 (11.2)
	01	168 (82)
	02	14 (6.8)
	03	0 (0)
Sleep latency	00	24 (11.7)
	01	107 (52.2)
	02	50 (24.4)
	03	24 (11.7)
Dysfunction throughout the day	00	49 (23.9)
	01	144 (70.2)
	2	10 (4.9)
	3	2 (1)
Sleep efficiency	>85 %	85 (41.5)
	75–84 %	71 (34.6)
	65–74 %	33 (16.1)
	<65 %	16 (7.8)
Sleep quality	Very Good	7 (3.4)
	Fairly Good	134 (65.4)
	Fairly Bad	57 (27.8)
	Very Bad	7 (3.4)
Sleep medication	Not during the past month	202 (98.5)
	Less than once a week	1 (0.5)
	Once or twice a week	1 (0.5)
	Three or more times a week	1 (0.5)
Overall PSQI (Mean + SD)	**4.50 ± 3.12**	

By doing categorization of athletes on basis of PSQI score for good sleepers and bad sleepers, the results showed that n=84 athletes were bad sleepers. Of whom the majority of the bad sleepers were males n=75 (89.3%), and having age group of 18-30 years n=71 (84.5%). The majority of the athletes having a Master's level of education were bad sleepers and statistically significant while n=43 (51.2%) were unemployed (details are in table 3). A binary logistic regression was performed while taking the PSQI score as dependent and other factors (age, gender, education status, employment status, city of residence, and game) as an independent. There was no statistically significant relationship between any of the variables and the PSQI score, according to the findings.

Table 3: Characteristics of good sleep and bad sleep among participants n=205

Statement	Bad sleepers [PSQI score > 5] (n=84) N (%)	Good sleepers [PSQI score < 5] (n=121) N (%)	p-value
Gender			
Female	9 (10.7)	10 (8.3)	0.431 a
Male	75 (89.3)	111 (91.7)	
Age			
18-30 years	71 (84.5)	102 (84.3)	0.279 b
31-40 years	12 (14.3)	13 (10.7)	

41-50 years	1 (1.2)	6 (5.0)	
Education status			
Secondary school	3 (3.6)	18 (14.9)	0.027* a
Higher secondary school	19 (22.6)	26 (21.5)	
Bachelor	23 (27.4)	38 (31.40	
Master	39 (46.4)	39 (32.2)	
Employment status			
Unemployed	43 (51.2)	52 (43.0)	0.617 a
Self-employee/Own business	5 (6.0)	10 (8.3)	
Govt employee	20 (23.8)	29 (24.0)	
Private employee	16 (19.0)	30 (24.8)	
City of residence			
Islamabad	16 (19.0)	18 (14.9)	0.556 b
Peshawar	16 (19.0)	28 (23.1)	
Mardan	16 (19.0)	18 (14.9)	
Lahore	6 (7.1)	9 (7.4)	
Swat	5 (6.0)	3 (2.5)	
Faisalabad	8 (9.5)	8 (6.6)	
Multan	4 (4.8)	6 (5.0)	
Karachi	3 (3.6)	1 (0.8)	
Mian Chanu	6 (7.1)	21 (17.4)	
Kohat	1 (1.2)	1 (0.8)	
Nowshera	1 (1.2)	2 (1.7)	
Bannu	1 (1.2)	1 (1.7)	
Swabi	0 (0)	1 (0.8)	
Sarghoda	1 (1.2)	0 (0)	
Abbottabad	0 (0)	1 (0.8)	
Bahawalpur	0 (0)	1 (0.8)	

*a=Independent T-test test, b= ANOVA test, * p-value <0.05 and statistically significant*

Discussion

This study aimed to learn about the sleep complaints of Pakistani athletes in various cities across the world. The key findings revealed that 52.2 percent of Pakistani athletes had moderate sleep disorders, while 70.25 percent had mild daytime dysfunction. Person and team sports athletes had different perspectives on the impact of insufficient sleep on results 9. Person and team sport athletes had different estimated probabilities of sleep disruption based on their age 29. Increased daytime instability was the most commonly reported result of sleep disruption in our study (70.25 percent). Daytime dysfunction was identified as the most frequently described outcome of insufficient sleep in previous studies of athletes 30 and the general population 31, and daytime dysfunction was recognized as the most frequently described result of insufficient sleep. Individual sport athletes tend to be similar to team sport athletes in terms of reported sleep issues, although these results vary from those of Erlacher et al... [30] Individual sport athletes reported more poor sleep than team sport athletes, according to the researchers. The lower pressure and anxiety faced in team sports can be explained by the fact that, unlike professional sports athletes, these athletes are not solely liable and accountable for their outcomes. [30]. Although more research is required to fully understand the differences in sleep patterns between individuals and team sports athletes, our current evidence suggests that sleep education through behaviors that are thought to encourage improved sleep quantity and quality [32] can be beneficial for individual and team sports athletes as a result of sleep enhancement... Because of the many factors that lead to bad sleep 32, defining normal sleep in athletes and various age groups remains a challenge. Age-related sleep variations have been documented; however, these differences are most noticeable in people over the age of 40, limiting the utility of these data in our athlete population. [33]. The exact reason why individual sport athletes are more likely to suffer from sleep disturbance is unknown, and more research is needed.

Although the current study sheds light on an important subject, it has some limitations that should be addressed in future research. The following are some of the study's possible limitations: the study only included a small number of athletes, which could restrict the generalizability of the results. As a result, larger future studies could provide a better understanding of this issue.

Conclusion

Overall, the findings of this study showed that athletes have disturbed sleep quality and interventions should be done to improve sleep quality so that the performance of the athletes can be improved. Furthermore, we found no statistically significant predictors of poor-quality sleep, so larger future studies are needed to gain a better understanding of the problem.

Recommendations

The study findings showed poor sleep quality among athletes, so interventions and further studies should be designed and conducted to improve sleep quality among athletes to enhance their performance.

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All authors read and approved the final version of the manuscript.

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