



Mobile Phone Usage on Change of Athletes Sleep Behaviour because of COVID-19 Pandemic Lockdown in India

W. Vinu^{1*} and Aranga. Panbilnathan²

¹Department of Physical Education, Annamalai University, India.

²Government Arts and Science College, Vanur, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Many researchers during several decades have proved that sleep is a key factor for enhancing performance in sports. Henceforth, this study is to investigate the impact of a mobile phone on changes in athletes sleep behaviour because of COVID-19 lockdown in India. For which, the survey conducted among 550 sports persons representing various Universities (300 male/250 female) across various states of India using simple random sampling technique, and Sleep Quality Assessment (PSQ: Pittsburgh Sleep Quality Index) was used to find out the level of sleep disturbance in athletes. The composed data were analysed using a percentile. The results of this study showed that the mobile phone usage during COVID-19 lockdown in India out of 550 athletes' data was collected in which 6.4 % of athletes with a score of 4 in the scale were not distracted due to COVID-19 lock down they underwent regular sleeping schedule there was no change in their circadian rhythm, 40.4 % of athletes with a score of 6 which means there was a high level of distraction in sleep due to COVID-19 lock down and 23% of the athletes suffered a very high level of

*Corresponding author: E-mail: wilsonvinu@gmail.com;

sleep destruction during COVID-19 lock down. Which showed a changed sleep behaviour of sports persons.

Conclusion and Recommendations: Lack of exercise during COVID-19 lockdown changed the sleep behaviour in athletes. Which made an addiction towards mobile phone usage. This study concludes that regular exercise enhances sleep and also keeps athletes from over usage of mobile phones.

Keywords: Athletes; sleep behaviour; COVID-19 pandemic lockdown; sleep quality assessment (PSQI: Pittsburgh sleep quality index); India.

1. INTRODUCTION

Human needs ample of sleep for sound living in this study we are going to do a survive on changes on sleep behaviour because of COVID-19 Lock down, sleep regulates cell growth, regulates metabolism and also balance the psychological wellbeing of human, so all the said factors are vital for an athlete's achievement which comes out only through ample of sleep. An athlete should sleep at minimum of 7 hours and maximum of 9 hours a day to get recovery for the next day's scheduled workout. Required amount of sleep can benefit athletes, in their recovery, and their performance. Researches on several decades proves that sleep is one of the important factors for athletes' performance in sport [1]. The duration of the wake period, as well as on the biological time of day, decided the structure of sleep and the amount of sleepiness. Duration of sleep, quality, and the circadian rhythm are important factors in terms of the overall convalescent result of sleep [2]. Because the physical and mental demands of sports persons are unique, aggressive behaviour is the intention underlying the act of behaviour [3]. To entertain or to spent out the time tile they fell sleepy Several young adulthoods are using mobile phones within the hour before trying to fall asleep or using cell phones in bed, which interferes with the ability to fall asleep and stay asleep throughout the night. Functionally, cellular phone use short before bed has been linked to several negative outcomes [4]. If an athlete practices a regular late night sleep day by day, his body adopts to late night sleep. The usage of mobile phone increased in the athletes because of lack of their regular physical work during COVID-19 lock down.

There are many reasons which affect the sleep behaviour of athletes. As a matter of course, sleep/wake patterns do not emerge every night. Therefore, it is foremost important to investigate the changes in sports persons' sleep in different contexts. In this context, this study was proposed

to examine whether there exists any difference in the average intensity of athletes' sleep behaviour during COVID-19 lockdown in India because of mobile phone usage.

Athletes are prone to practice their rigorous schedule, because of their rigorous practice they won't have time for other activities, eventually they go to bed earlier to wake up early in the morning for their next day work out, but because of COVID-19 lock down all the gymnasiums, stadiums and grounds were locked so athletes were unable to participate in any of their regular practice which brought change in their regular life style made them addicted to mobile phones which resulted in change in sleep behaviour in athletes [1].

2. METHODS

2.1 Sleep Quality Assessment (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep-in adults. It differentiates "poor" from "good" sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month.

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions. A total score of "5" or greater is indicative of poor sleep quality. If you scored "5" or more it is suggested that you discuss your sleep habits with a healthcare provider

This survey was completed by a sample of 550 participants of (300 male/250 female) across selected universities in India. All participants were aged between 18-28 yrs. at the time of

taking part in the study. The ‘athlete’ population used in this study were selected from different universities who participated in varied sports events. Irrespective of the event, the complete list of sports persons in selected universities was prepared and from that list 550 participants were selected using simple random sampling technique. Ethical clearance obtained from DARE, Annamalai University. The data were collected from the respondents using Sleep Quality Assessment (PSQI). The questionnaires were administered to all participants via email and google forms. All questionnaires asked participants to answer the questions sleep behaviour during COVID-19 lockdown period. The data were collected during the period of second lockdown in India (i.e., May-2021 to June 2021). The composed data were analysed using a percentile method.

2.2 Data Analysis

The data were collected from the samples using Sleep Quality Assessment (PSQI). The questionnaires were administered to all participants via email and google forms. All participants answered the questions sleep

behaviour during COVID-19 lockdown period. The data were collected during the period of second lockdown in India (i.e., May-2021 to June 2021). From the collected data Percentile was calculated.

Why athletes use mobile phones at bedtime in COVID-19 lockdown?

- a. Sleep deprivation due to fail in regular practice sessions
 - b. To relax and entertain
 - c. Other personal usage
3. Result and Discussion

Table 1. showing the percentage of athletes using mobile phone for varied reasons, in which 83.5% of athletes were using mobile phones because of Sleep deprivation due to fail in regular practice sessions due to Covid 19 lock down they were unable to access ground, gymnasiums, 10.7% athletes were using mobile phones in order to relax and entertain themselves during the hard pandemic situation. And the other 5.8% of athletes were using mobile phones for other personal usage.

Table1. Percentage of Athletes Using Mobile Phone for Varied Reasons

Reasons	Frequency	Percent	Valid Percent	Cumulative Percent
1 Unable to Sleep due to fail in regular practice sessions	459	83.5	83.5	83.5
2. To relax and entertain	59	10.7	10.7	94.2
3. Other personal usage	32	5.8	5.8	100.0
Total	550	100.0	100.0	

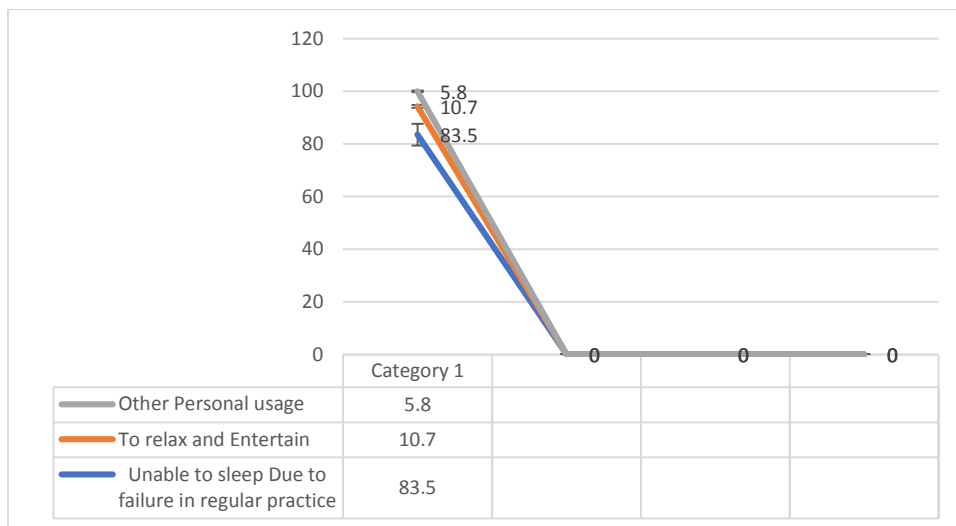


Fig. 1. Percentage of Athletes Using Mobile Phone for Varied Reasons

Table 2. The Pittsburgh Sleep Quality Index (PSQI) Assessment on Sleep quality of Athletes

Values	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 4.00	35	6.4	6.4	6.4
5.00	163	29.6	29.6	36.0
6.00	222	40.4	40.4	76.4
7.00	130	23.6	23.6	100.0
Total	550	100.0	100.0	

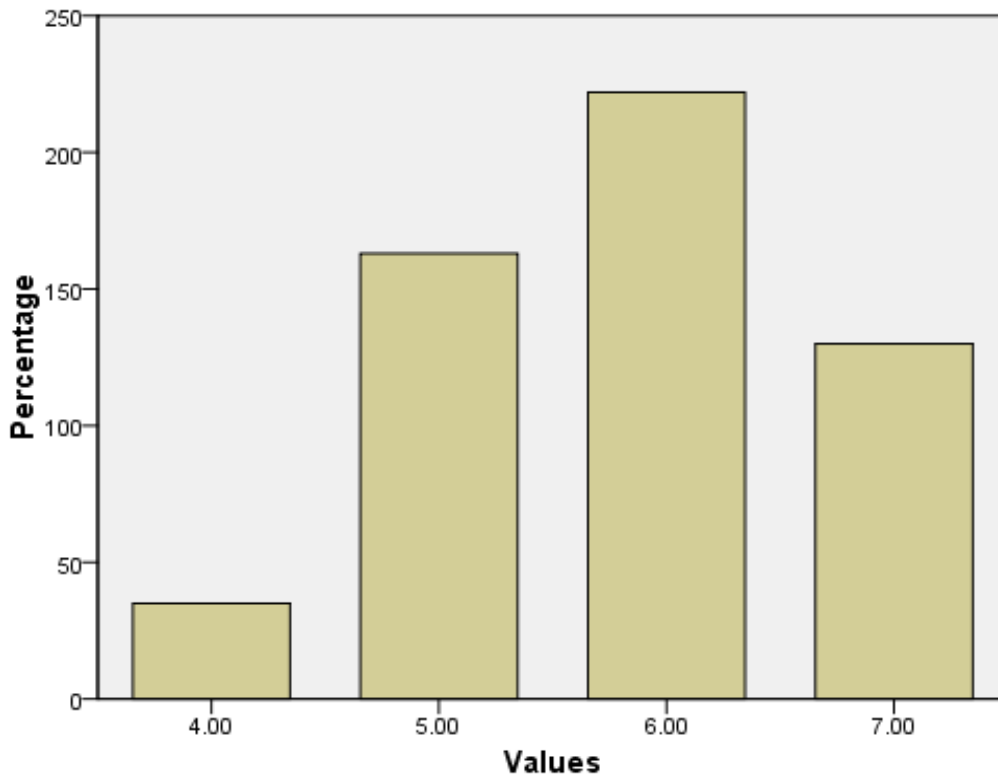


Fig. 2. Showing the Pittsburgh Sleep Quality Index (PSQI) Assessment on Sleep quality of Athletes

The Pittsburgh Sleep Quality Inventory PSQI is the most frequently used analyser of subjective self-report sleep quality for two main reasons. It was developed to quantify sleep quality also, in the majority of studies that validate a sleep questionnaire, the PSQI can be considered as a recognized reference for self-perceived sleep quality [5]. It is the most broadly used sleep health assessment tool in both clinical and non-clinical populaces [6].

Result of Table 2 reveals out of 550 athletes' data was collected in which 6.4 % of athletes with a score of 4 in the scale were not distracted due to COVID-19 lock down they underwent regular sleeping schedule there was no change in their circadian rhythm, 40.4 % of athletes with a score of 6 which means there was a high level

of distraction in sleep due to COVID-19 lock down and 23% of the athletes suffered a very high level of sleep destruction during COVID-19 lock down.

3. DISCUSSION

The reason behind athletes' diversion towards mobile phone and change in sleep behaviour during COVID-19 lock down was the athletes were unable to undergo their regular work usually in their workout schedule rest is one of the essential parts. Habitually after a strenuous work out athletes muscle gets fatigue which result in a deep sleep and Melatonin, released by the pineal gland in blood also increases due to a strenuous work which result in a deep sleep-in athlete but because of COVID-19 lock down

athletes were unable to undergo their regular work out which altered the sleep behaviour in athletes here re few studies which highlights the role of exercise in relation with sleep. Brand., et al. found exercise an hour and a half before bedtime to be associated with increased deep sleep and decreased REM sleep [7]. More specifically, individuals with greater self-perceived exertion during exercise had decreased light sleep and increased deep sleep compared with those who reported less self-perceived exertion [8]. The same investigators summarize their findings by stating that self-perceived exercise exertion and objectively assessed sleep are positively associated, meaning that the encouragement of exercise as part of daily physical activity likely benefits the objective aspects of sleep. One study demonstrated that twelve weeks of exercise training increased sleep duration and variables of sleep quality in adolescents. A review by Lang et al. explored these various differences in methodology and found that participants who engaged in high levels of physical activity were more likely to experience better sleep quality. These investigators reported that daily exercise of moderate intensity had differential effects on circadian melatonin rhythm, rectal temperature during nocturnal sleep, sleep stages, and heart rate variability depending on the time of day the exercise is performed. The interpretation of these results suggests that the timing of exercise is important for sleep quality. The authors concluded that exercise earlier in the day may improve the quality of nocturnal sleep owing to the fact that exercise stimulates the sympathetic nervous system. To improve sleep quality, Yamanaka et al. suggest enhancing parasympathetic activity by allowing time for the stimulation of the sympathetic nervous system to diminish. Subjects in this investigation engaged in a 15-week aerobic exercise intervention and completed sleep quality questionnaires, such as the Pittsburgh Sleep Quality Index (PSQI), at the start and end of the study [9]. This study also employed the commonly used PSQI to assess sleep quality and found a positive linear relationship between the global score and daily physical activity measured by step count. An increase in physical activity duration also produced better sleep quality scores [10]. Several of the following studies evaluate this hypothesis. Specially FA -2019. An increase in bedtime smartphone uses specially more than 60 minutes makes participants at great risk of having poor sleep quality [11]. and concluded that electromagnetic radiation emitted by mobile

phones 30 minutes before sleeping was found to delay the onset of melatonin production which in turn might affect sleep. There was a positive relationship between stress tolerance with EI: emotional intelligence which specifies that when EI: emotional intelligence increases stress tolerance increases for physical exercising persons vice versa [12].

Several studies of young adults, primarily from college campuses, also reveal mixed effects of exercise on sleep. Variations in the methods of these investigations make it difficult to compare the findings across studies; however, it is worth discussing the differences as they may allude to further understanding of the sleep-exercise relationship. A review by Lang et al. explored these various differences in methodology and found that participants who engaged in high levels of physical activity were more likely to experience better sleep quality [13]. These results were further supported by two separate analyses of exercise levels and the incidence of insomnia symptoms in cohorts of over 12,000 [14] and 450,000 Chinese citizens [15]. Both studies found that decreased physical activity led to an increased risk for insomnia.

This research states that there was a diversion in athletes behavioural change in sleep was due to COVID-19 lockdown because of lack of their usual work which in turn developed an addiction towards mobile phone usage, although we have found a clear association between smartphone usage at bedtime and poor sleep quality, we do need further research to find out the impacts of change of sleep behaviour in athletes due to mobile phone usage.

4. CONCLUSION

Lack of exercise during COVID-19 lockdown changed the sleep behaviour in athletes. Which made an addiction towards mobile phone usage. This study concludes that regular exercise enhances sleep and also keeps athletes from over usage of mobile phones.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical clearance obtained from DARE. Annamalai University.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Vinu W. Disparities in Sportspersons' Sleep Behaviour due to COVID-19 Pandemic Lockdown in India. *Asian Journal of Applied Science and Technology (AJAST)*. 2021;5(2):134-139.
2. Belenky G, Wesensten NJ, Thorne DR. Patterns of performance degradation and restoration during sleep restriction and subsequent recovery: A sleep dose-response study. *Journal of sleep*. Wiley Online Library; 2003.
3. Vinu W. Analyse of stress tolerance among exercising and non-exercising home makers. *International Journal of Psychosocial Rehabilitation*. 23(8):6257-6260.
4. Preety et al. Sleep deprivation and cell phone usage among teenagers. *Drug Invention Today | 2018*;10(10).
5. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Res*. 1989;28:193–213.
6. Mollayeva T, Thurairajah P, Burton K, Mollayeva S, Shapiro CM, Colantonio A. The Pittsburgh Sleep Quality Index as a screening tool for sleep dysfunction in clinical and non-clinical samples: A systematic review and meta-analysis. *Sleep Med. Rev*. 2016;25:52–73.
7. Brand S, Kalak N, Gerber M, Kirov R, Pühse U, Holsboer-Trachsler E. High self-perceived exercise exertion before bedtime is associated with greater objectively assessed sleep efficiency. *Sleep Medicine*. 2014;15(9): 1031–1036. DOI:10.1016/j.sleep.2014.05.016.
8. Mendelson M, Borowik A, Michallet AS et al. Sleep quality, sleep duration and physical activity in obese adolescents: effects of exercise training. *Pediatric Obesity*. 2016;11(1):26–32. DOI: 10.1111/ijpo.12015.
9. Yamanaka Y, Hashimoto S, Takasu NN et al. Morning and evening physical exercise differentially regulate the autonomic nervous system during nocturnal sleep-in humans. *American Journal of Physiology—Regulatory Integrative and Comparative Physiology*. 2015;309(9):R1112–R1121. DOI:10.1152/ajpregu.00127.2015.
10. Erlacher C, Erlacher D, Schredl M. The effects of exercise on self-rated sleep among adults with chronic sleep complaints. *Health Science*. 2015;4(3): 289–298.
11. Wood AW, Loughran SP, Stough C. Does evening exposure to mobile phone radiation affect subsequent melatonin production? *Int J Radiat Biol*. 2006;82:69-76.
12. Vinu W. Emotional intelligence and stress tolerance of diabetic physical exercising and diabetic nonphysical exercising peoples on critics. *Journal of Pharmaceutical Research International*. 2021;33(39B):46-52. Available:https://doi.org/10.9734/jpri/2021/v33i39B32178.
13. Lang C, Kalak N, Brand S, Holsboer-Trachsler E, Pühse U, Gerber M. The relationship between physical activity and sleep from mid adolescence to early adulthood. A systematic review of methodological approaches and meta-analysis. *Sleep Medicine Reviews*. 2016; 28:28–41. DOI:10.1016/j.smr.2015.07.004.
14. Chen LJ, Steptoe A, Chen YH, Ku PW, Lin CH. Physical activity, smoking, and the incidence of clinically diagnosed insomnia. *Sleep Medicine*. 2017;30:189–194.
15. Zheng B, Yu C, Lin L et al. Associations of domain-specific physical activities with insomnia symptoms among 0.5 million Chinese adults. *Journal of Sleep Research*; 2017. DOI:10.1111/jsr.12507.

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