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## Effects of deprivation of sleep on the catching accuracy in cricket

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### Abstract

Physical performance, Balance diet, and Sleep are the vital prerequisite for dynamic top athletic performance at competitions. Proper nutrition and practice are considered as the base for concrete sports performance. Sleep is often mistreated by athletes in order to have more practice and improved athletic performance. In 21<sup>st</sup> century cricket is globalized and changed in such a way that no player want to afford any limitations in match. Cricket departments i.e. Batting, Bowling, Fielding chiefly requires consistent practice drills matches and proper fuelling through diet. Sleep which is considered as crucial part of daily routine is missing somehow and somewhere in regular dedicated practice. The accuracy is dependent on our brain functioning better brain functioning can be achieved through proper recovery and rest.

The aim of the study was to find out how sleep deprivation will affect the catching accuracy of cricket players. For the purpose of the study, 15 male cricket players from Heritage International School, Aligarh Uttar Pradesh were selected (age group 14 yrs – 17 yrs). The experiment was conduct for three days. The group was first provided with complete 8 hour sleep and catching accuracy test was conducted. The same experimental group after one day gap was deprived form one night sleep and then catching accuracy test was conducted. The mean catching accuracy score of Day one was (8.47) and the mean catching accuracy score of Day three was (6.27) and the mean difference the Day one & Day three catching accuracy was (2.20) & tested by 't' test. The significance difference exists between pre-test mean and post-test mean because calculated t value 5.60 is greater than the tabulated value 2.14. Day two scores were found to be statistically significant at .05 level of confidence. On the basis of recorded data a complete sleep can play vital role in enhancing the accuracy of catching ability of cricket players.

**Keywords:** sleep, accuracy, deprivation, cricket, catching

### Introduction

Sleep is a condition of mind and body which naturally recurs for several hours every night, in which the eyes closed, nervous system is inactive, the postural muscles relaxed, and awareness practically suspended <sup>[1]</sup>. Sleep is an essential component of health and well-being, with significant impacts on physical development, emotional regulation, cognitive performance, and quality of life.

Peak athletic performance appears to be a function of three things: physical performance, adequate nutrition, and sleep. The first two of these appear to be common sense, perhaps the two things that come to mind when one thinks of an athlete achieving peak performance, but sleep plays an equally important role. Without adequate sleep, effective recovery cannot take place which resultantly impacts an athlete's performance. Current evidence recommends obtaining, on a regular basis, 7 or more hours of sleep per night to promote optimal health among adults aged 18 to 60 years. Obtaining at least eight hours is essential in preventing neurobehavioral deficits such as concentration difficulties, fatigue, emotional lability, irritability, and sleep and appetite disturbances. Sleep has been recognized as an essential component of preparation for, and in recovery from, high intensity training (Reilly & Edwards, 2007) <sup>[6]</sup>.

Exercise depletes energy, fluids, and breaks down muscle. Hydration and the right fuel are only part of training and recovery. What athletes do in the moments during and immediately after competition also determines how quickly their bodies rebuild muscle and replenish nutrients. This helps maintain endurance, speed, and accuracy. Some research suggests that sleep deprivation increases levels of stress hormone, cortisol. Sleep deprivation has also been

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seen to decrease production of glycogen and carbohydrates that are stored for energy use during physical activity. In short, less sleep increases the possibility of fatigue, low energy, and poor focus at game time. It may also slow recovery post-game. Whether you're at the top of your game or in the game for the fun of it, getting the proper amount of sleep is necessary to face the world with your best food forward. Sleep will help you on the road to good fitness, good eating, and good health [2].

**Deprivation:** Deprivation in term of word meaning that “scarcity of something” or shortage of some things in quantity.

**Deprivation of sleep:** Not adequate and proper sleep in 24 hours of cycle .It can be either chronic or acute. A chronic sleep restricted state cause fatigue, daytime sleepiness, clumsiness and weight loss or weight gain.

**Accuracy:** Accuracy is a term or attribute that represents a player’s precision or aim, and affects the his ability to perform critically skill against his opponent with attacks. Sleep is an important part in your cricket training plan no matter what your goals. According to studies the main reasons are preventative [3]:

1. Sleep deprivation reduces your work capacity by dropping your energy stores (glycogen) efficiency.
2. Sleep deprivation reduces concentration and attention span.
3. Sleep deprivation increases recovery time between games by raising cortisol levels.

Schmidt & Wrisberg (2004) [4] expressed accuracy as the amount of variability or inconsistency of performer’s movement end point in the target area.

Accuracy can be divided into three such as spatial accuracy, temporal accuracy and timing accuracy. Spatial accuracy

required of aiming movements for which spatial position of the movement’s end point is important to task performance. Speed or distance is decreased such as down the line serve in volleyball; dart throwing; target archery. Temporal accuracy required of rapid movements for which accuracy of the movement time is important to task performance; more commonly referred as timing accuracy. The last one is timing accuracy required of rapid movements and decreased movement time for also referred to as temporal accuracy such as tennis drive or badminton smash (Schmidt & Wrisberg, 2004, Kluka, 1999) [4, 5].

**Selection of the subjects**

For the purpose of the study, the sampling technique used was probability random sampling,(lottery method) where a total of 15 male cricket players, was selected from Heritage International School, Aligarh Uttar Pradesh selected (age group 14 yrs – 17 yrs).

**Procedure of experiment**

The experiment was conduct for three days. The experimental group was first provided with complete 8 hour sleep (10:00 pm to 6:00 am) and catching accuracy test was conducted.

Researcher designed a fielding plan where subjects were asked to take start from 20 meter. Low trajectory catches were shot by the researcher. 10 catches trail was given to each player where each catch taken is counted as 1 and dropped catch was counted as 0 the same experimental group after one day gap was deprived form one night sleep and then catching accuracy test was conducted. Same process was repeated and data was recorded.

**Statistical analysis**

Provide sample t-test was applied to investigate catching accuracy of subjects with level of significance was selected at 0.05.

**Table 1:** Group means difference in performance of catching efficiency in cricket players before and after deprivation of sleep.

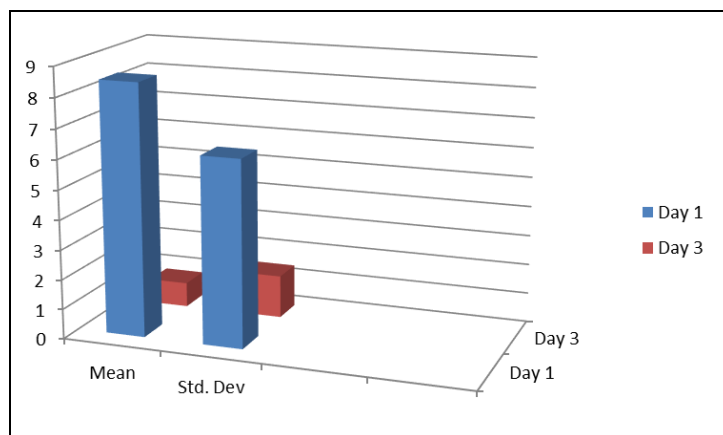
Group	Number of subjects	Mean	Std. Deviation	t value	Mean difference
Day 1 (after complete sleep)	15	8.47	0.83	5.60	2.20
Day 3 (after incomplete sleep)		6.27	1.44		

\*Significant at 0.05 level, [Tabulated value = 2.14, df= 14]

The mean and standard deviation of catching scores of Day 1 and Day 3 at the experiment were (8.47±0.83) and (6.27±1.44).

The mean performance pre and post were 8.47 and 6.27

respectively at the conclusion of experiment thus, the performance on the Day 3 decrease as compare of Day 1 recorded data.



**Fig 1:** Difference between day one catching score mean and day three catching score mean of cricket players before and after deprivation of sleep

## Result

The score of catching accuracy were taken before and at the end of the experiment. The mean score of Day one was (8.47) and the mean score of Day three was (6.27) and the mean difference the Day one & Day three was (2.20) & tested by 't' test. The significance difference exists between pre-test mean and post-test mean because calculated value 5.60 is greater than the tabulated value 2.14. Day two scores were found to be statistically significant at .05 level of confidence.

## Discussion on Findings

Sleep deprivation has been shown to have a detrimental effect on various aspects of human functioning, including cognitive function, mood, and physical performance. The study provides evidence that a lack of sleep negatively impacts the fine motor skills needed for accurate shooting in handball and implies that adequate sleep is essential for maintaining performance in precision-based sports activities. (Kumar, 2018) [7] Specific studies have demonstrated that sleep deprivation can significantly impair accuracy in sports performance. For example, research has found that sleep deprivation can lead to decreased spatial accuracy in aiming movements, timing errors in rapid movements, and increased variability or inconsistency in performance outcomes. Furthermore, sleep deprivation has been linked to slower reaction times, reduced accuracy in shooting and throwing tasks, and decreased precision in movements. These findings suggest that adequate sleep is essential for maintaining optimal accuracy in sports.

## Conclusion

On the basis of the result significant difference were found in catching accuracy before deprivation of sleep and after deprivation of sleep. Catching accuracy is result of mind activity and its integration with senses and muscle coordination. But it has been proved in this study that if we ignore to sleep well than our concentration, attention, steady mind, balance and good perception decrease time to time. By the deprivation of sleep our metabolic activities and kinaesthetic senses does not work adequately. Deprivation of sleep as per the preceding discussion significant difference was found and it is recommended that a complete sound sleep is requires for enhancing the accuracy for greater performances.

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