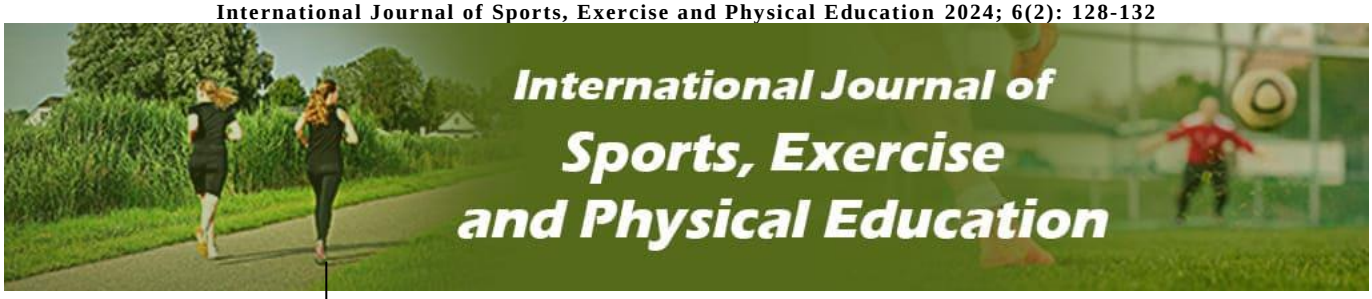

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Sleep quality and mood state in relation to performance among cricketers

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Abstract
This study investigates the relationship between sleep quality, mood state, and performance among 50 state-level cricketers (25 male and 25 female) from Kerala, India, aged 18 to 25. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while mood state was evaluated with the Brunel Mood Scale (BRUMS). Performance was rated subjectively during state-level cricket competitions. Descriptive statistics, the Shapiro-Wilk normality test, Pearson product-moment correlation, and the Mann-Whitney U test were employed to analyse the data, with significance set at $p < 0.05$. Results indicated no significant differences in sleep quality and mood states between male and female cricketers, suggesting that gender does not significantly influence these psychological factors. However, correlation analyses revealed that sleep quality positively correlates with performance, while negative mood states (anger, depression, tension, fatigue, confusion, and mood state) are negatively correlated with performance. These findings align with previous research showing that psychological factors critically impact athletic performance, regardless of gender. The study underscores the importance of managing psychological aspects to optimize cricket performance and suggests the need for gender-neutral interventions to address these factors effectively.

Keywords: Sleep quality and mood state

Introduction
Sleep and mood affect the living process and are vital aspects of an individual's well-being, including physical and psychological health and brain performance. Sleep and mood maintenance are essential for the excellent performance in the sports and these are most relevant to the cricket as it is high intensity and high pressure sport. Cricket is a contact game that calls for quick decisions, fast muscular responses and, concentration spanning a continued period.

This indicates that sleep quality, mood state as well as performance are interrelated and influence one another. Stress and anxiety lead to poor sleep whereas positive mood is expected to improve the quality of sleep. This interaction has giant importance to cricketers because low quality of sleep and negative mood affect the performance, enhances the exposure to injury and decline the well-being of the cricketer.

The purpose of the present study is to identify the correlation between sleep quality, mood state, and performance in cricketers. Knowledge of this correlation can benefit coaches, trainers and sportsmen to improve the performance and achieve competitive advantage as well as minimising chances of developing injuries and dropout.

Nonetheless, sleep and mood have been identified to be strongly associated with athletic performance, but surprisingly few works have looked at how they affect cricketing performance in particular. Most of the literature review has targeted other sporting disciplines thus leaving a 'black hole' on determination of cricket's specific needs. For example, Simpson *et al.* (2017) [13]. Studied on the correlation between sleep quality and performance of a rugby team which contributed positively to physical performance. In a study done by O'Donovan *et al.*, 2018 [10]. On Soccer players, the performance of soccer players was considered and it was noted that when in a positive mood state, performance was boosted. Many researchers including Gupta *et al.*, (2019) [3] have investigated the impact that has resulted from the sleep loss to cognition in athletes within the group and coercive conclusions have been realized which show that indeed there is severe decline in the

cognitive features linked to attention as well as decision making among athletes. Bird *et al*. (2018) [1] also analyzing sleep quality and mood state in athletes also reported the positive but strong correlation associated with sleep quality and mood state. In the study by Kumar *et al*. 2020, performance of tennis players and relation with sleep quality was examined and substantial relationship was observed between the two.

This evidence illustrates a relationship between sleep quality and mood state with performance in athletics but the nature is still unknown in the case of cricket. This study will fill this gap through assessing the Cricketer's sleep quality, mood state, and subsequent performance.

Many of the athletes including the cricketers experience poor sleep quality and negative mood states. Cricketing activity, due to its physical and mental requirements as well as pressure resulting from performance expectation results in personnel sleep and negative mood conditions. When unmitigated, such concerns threaten productivity, raise the likelihood of accidents and decrease general health. Therefore, examining the correlation between sleep quality, mood state, and performance in cricketers, this research can help to develop effective recommendations on how to enhance the result in the field and improve health of the athletes.

Statement of the Problem

This study investigates the relationship between sleep quality, mood state, and athletic performance among state-level cricketers in Kerala, India. Despite the importance of these factors in sports, limited research exists in this context, prompting an exploration of how sleep and mood influence cricketers' competitive performance.

Objectives of the Study

1. To assess the sleep quality mood state and performance of the cricket players
2. To compare the sleep quality and mood state of male and female cricketers
3. To discover the relationship between mood state sleep quality and performance of state level male and female cricketers

Materials and Methods

Selection of Participants

To achieve the purpose, fifty (N=50) state level cricket players (twenty five (n=25) male and twenty five female (n=25) were purposively selected from Kerala, India. The ages of these subjects ranged from 18 to 25 years, and all selected participants expressed willingness to participate in this study.

Inclusion Criteria

- Participants must be between 18 to 25 years old.
- Both male and female participants, with 25 males and 25 females included.
- Participants must have competed in state-level cricket competitions during the 2022-23 season.
- Participants must be residents of Kerala, India.
- Participants must provide informed consent and be willing to comply with the study's requirements.
- Participants must be generally healthy, without chronic physical or psychological conditions that might affect sleep or mood.
- Participants must have at least three years of competitive cricket experience at the state or district level.

Exclusion Criteria

- Participants with diagnosed sleep disorders or mood disorders that could independently influence the study variables.
- Participants currently taking medication that affects sleep or mood (e.g., antidepressants, sleep aids).
- Participants who have sustained injuries in the last six months that significantly affect their physical performance or mental well-being.
- Participants who are engaged in shift work or have irregular sleep patterns due to professional commitments outside cricket.
- Participants who did not regularly participate in training or competitions during the 2022-23 season.

Selection of Variables

Specifically, sleep quality was measured by the Pittsburgh Sleep Quality Index; PSQI is used globally assess multiple aspects of sleep about one month prior or within one month, therefore permitting maximum coverage of the participants' sleep quality. Mood state was assessed using stone Brunel Mood Scale (BRUMS) which offers information about six unique mood characteristics therefore enabling assessment of the athletes' mood. Cricket players' performance was self-evaluated during state-level cricket matches, thereby making it easier to compare actual sleep, mood and performance on the field. These variables were considered to offer a sound understanding of relationship between sleep and mood and the interaction of the two on performance.

Research Design

The study used a cross-sectional research design to measure the sleep quality, mood state, and performance of the state-level cricketers from Kerala, India. Thus, the sample comprised fifty (N=50) cricketers consisting of twenty-five (n=25) male and twenty-five (n=25) female participants between the age of 18-25 years were selected purposively with consideration on the basis of their participation at state level competition for the season 2022-23. In order to check the quality of the obtained sample for sleep, the Pittsburgh Sleep Quality Index (PSQI) was completed. The PSQI is a self-administered, originally designed and standardized tool that assesses sleep diary and sleep quality and its disturbances occurring within a month and gives a global score. This tool was selected since it is widely used for the assessment of different variables in sleep such as duration, latency, and any disturbances.

Mood state was measured using the Brunel Mood Scale (BRUMS), which captures six mood dimensions: Aggression feelings, confusion, depression, fatigue, tension, and vigor feelings are the feelings used in this study. Self-reporting is an essential measuring technique in sports research, and the BRUMS has specifically been employed to evaluate athletes' moods, thus fits well in this study. All participants filled the BRUMS to obtain a subject's general mood at the time of question completion for subsequent examination of the relationship between mood and sleep quality and performance.

Subjective assessment was used in esteeming performance especially during the state level contest. These ratings were

established with the help of coaches, selectors, or experienced sports professionals as the participants' competitive performances during the 2022–23 season. This way of assessment was also subjective, which enabled to focus on some factors that define performance,

Data collection was carried out in a single session, where participants completed the PSQI and BRUMS questionnaires, and performance ratings were obtained from relevant sports authorities. The data were then analysed to explore potential correlations between sleep quality, mood state, and performance. This design facilitated the examination of how sleep and mood variables were associated with athletic performance in a real-world competitive setting.

Statistical Techniques

To assess the characteristics of the data, descriptive statistics, Shapiro wilk normality test were applied. Pearson product moment corelation was employed to determine the relationship between the variables and the performance. Mann Whitney Utest was used to compare the sleep quality and mood state of male and female cricketers. In all the cases the significance was set at 0.05 level.

Results of the study

Table 1: Test of normality for sleep quality and mood state and its sub-variables scores of male and female cricketers

Shapiro Wilk Test			
Variables	**Group**	**Statistics**	**Significance**
Sleep Quality	Female	0.86	0.01
	Male	0.92	0.03
Anger	Female	0.76	0.01
	Male	0.92	0.02
Depression	Female	0.76	0.01
	Male	0.93	0.31
Tension	Female	0.88	0.03
	Male	0.81	0.01
Vigor	Female	0.87	0.01
	Male	0.94	0.78
Fatigue	Female	0.70	0.01
	Male	0.90	0.19
Confusion	Female	0.83	0.04
	Male	0.91	0.15
Mood State	Female	0.86	0.02
	Male	0.94	0.22

The Shapiro-Wilk method was used to evaluate the sleep quality of male and female cricket players. The test revealed a p-value of less than 0.05, indicating that the data were not normally distributed. This lack of normality also applied to mood state and its sub-variables: anger, depression, tension, Vigor, fatigue, and confusion.

Table 2: Mann Whitney U test for sleep quality, mood state and its sub variables of male and female cricketers

Variables	**Male**		**Female**		**Z Value**	**P Value**
	M	**SD**	**M**	**SD**		
Sleep Quality	6.12	1.31	5.15	2.12	-1.10	0.20
Anger	2.55	2.11	3.10	2.76	-0.21	0.29
Depression	3.44	1.60	2.61	2.21	-1.66	-0.44
Tension	4.55	2.31	4.66	2.22	-0.46	0.62
Vigour	6.55	2.55	5.40	2.91	-.1.19	0.21
Fatigue	4.25	1.56	5.87	3.60	-1.20	-0.52
Confusion	3.33	1.33	3.20	2.70	-0.51	0.09
Mood State	24.40	5.00	24.96	06.01	-0.56	0.66

*Sig at 0.05 levels

Table 2 presents the results of the Mann-Whitney U test comparing male and female cricketers across various measures. For sleep quality, male cricketers had a mean of 6.12 (SD = 1.31) and female cricketers had a mean of 5.15 (SD = 2.12). For anger, the mean was 2.55 (SD = 2.11) for males and 3.10 (SD = 2.76) for females. Depression scores were 3.44 (SD = 1.60) for males and 2.61 (SD = 2.21) for females. Tension had means of 4.45 (SD = 2.31) for males and 4.66 (SD = 2.22) for females. Vigor was 6.55 (SD = 2.55) for males and 5.40 (SD = 2.91) for females. Fatigue scores were 4.25 (SD = 1.56) for males and 5.87 (SD = 3.60) for females. Confusion had means of 3.33 (SD = 1.33) for males and 3.20 (SD = 2.70) for females. The mood state was 24.40 (SD = 5.00) for males and 24.96 (SD = 6.01) for females.

Statistical analyses revealed no significant differences between male and female cricketers across these variables. Specifically, for sleep quality (Z = -1.10, p = .20), anger (Z = -0.21, p = .29), depression (Z = -1.66, p = .44), tension (Z = -0.46, p = .62), Vigor (Z = -1.19, p = .21), fatigue (Z = -1.20, p = .52), confusion (Z = -0.51, p = .09), and mood state (Z = -0.56, p = .66), all p-values were greater than .05, indicating no statistically significant differences.

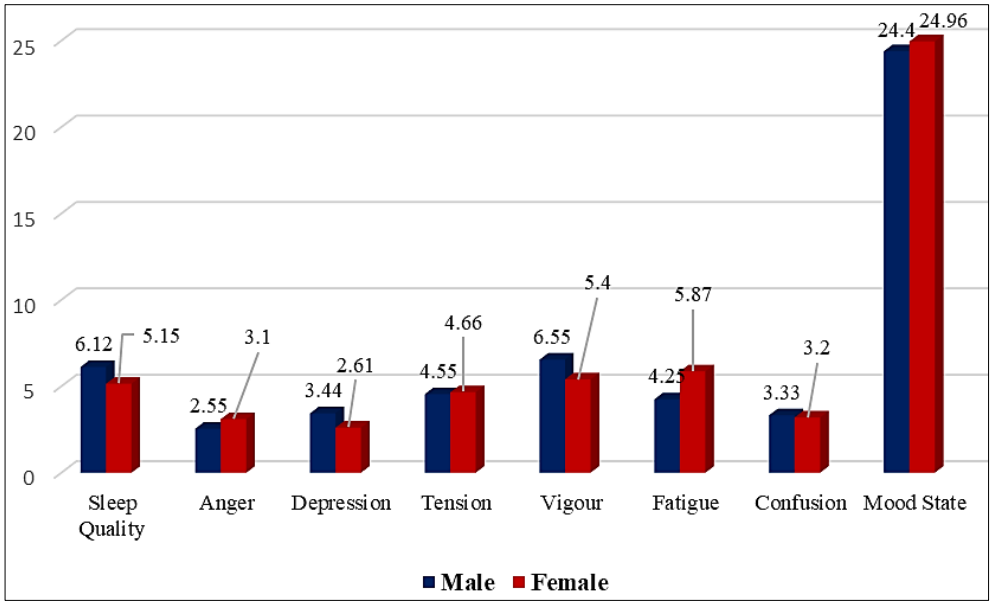

Fig 1: Graphical Representation of the mean value for sleep quality, mood state and its sub variables of male and female cricketers

Table 3: Relationship between sleep quality, mood state, its sub variables and performance of male and female cricketers

Variables	Male			Female		
	R Value	P Value	Performance	R Value	P Value	Performance
Sleep Quality	.88	0.00	1	0.90	0.00	1
Anger	-.51	0.02		-.70	0.00	
Depression	-.80	0.00		-.75	0.00	
Tension	-.55	0.00		-.59	0.04	
Vigour	.81	0.00		.90	0.00	
Fatigue	-.70	0.00		-.88	0.00	
Confusion	-.61	0.02		-.70	0.00	
Mood State	-.78	0.00		-.65	0.00	

**Sig at 0.05 level*

Tables 3 reveal correlations between various psychological factors and performance in cricketers. Sleep quality is positively correlated with performance for both female (r = .90, $p < .05$) and male cricketers (r = .88, $p < .05$). Anger negatively affects performance in female cricketers (r = -.70, $p < .05$) and male cricketers (r = -.51, $p < .05$). Depression is also negatively correlated with performance for both genders (female: r = -.75, $p < .05$; male: r = -.80, $p < .05$). Tension shows a negative correlation with performance (female: r = -.59, $p < .05$; male: r = -.55, $p < .05$). Vigor is positively correlated with performance for both female (r = .90, $p < .05$) and male cricketers (r = .81, $p < .05$). Fatigue negatively impacts performance (female: r = -.88, $p < .05$; male: r = -.70, $p < .05$). Confusion is negatively correlated with performance for both genders (female: r = -.70, $p < .05$; male: r = -.61, $p < .05$). Finally, mood state negatively affects performance (female: r = -.65, $p < .05$; male: r = -.78, $p < .05$).

Discussion on Findings

The findings of this study reveal that there are no significant differences in sleep quality, anger, depression, tension, vigor, fatigue, confusion, and mood state between male and female cricketers, as indicated by the non-significant p-values in the Mann-Whitney U tests. This result suggests that both male and female cricketers experience similar levels of these psychological factors, and gender does not significantly influence these aspects of their psychological state. This aligns with previous research showing that psychological stressors and their impact on performance can be similarly experienced by athletes regardless of gender. For instance, studies by Gould *et al.* (1999) [2] and Lundqvist (2011) [7] found that both male and female athletes face comparable psychological challenges related to stress, performance anxiety, and coping mechanisms. This lack of significant difference could indicate that the psychological demands and coping strategies employed by cricketers are consistent across genders, reflecting a shared experience in competitive environments.

On the other hand, the correlation analyses presented in Tables 3 highlight how psychological factors are significantly related to performance in both male and female cricketers. Sleep quality is positively correlated with performance, consistent with findings by Reilly and Edwards (2007) [12], which underscore the importance of sleep in optimizing athletic performance. The negative correlations between anger, depression, tension, fatigue, confusion, and mood state with performance corroborate previous research emphasizing the detrimental effects of negative psychological states on athletic outcomes (Petrie, 1992; McCarthy & Jones, 2007) [11, 8]. For example, high levels of anger and depression can impair concentration and motivation, negatively affecting performance (Meyer *et al.*, 2001; Hackfort & Spielberger, 1989) [9, 4]. Conversely, vigor, which reflects a positive psychological state, is positively correlated with performance, echoing findings by Lane *et al.* (2009) [6] that highlight the role of positive mood and vigor in enhancing sports performance. These results underscore the complexity of psychological factors and their critical role in athletic performance, irrespective of gender.

The consistent pattern of correlations across genders suggests that while gender does not differentiate the levels of psychological factors, these factors universally impact performance in cricket, highlighting the need for tailored interventions to manage these psychological aspects effectively.

Conclusions

1. There are no significant differences in psychological factors such as sleep quality, anger, depression, tension, vigor, fatigue, confusion, and mood state between male and female cricketers.
2. Both male and female cricketers experience similar levels of psychological variables, indicating that gender does not significantly impact these aspects in the context of cricket.
3. Sleep quality and vigor are positively correlated with performance in cricketers of both genders, highlighting their importance for optimal athletic performance.
4. Anger, depression, tension, fatigue, confusion, and mood state are negatively correlated with performance, emphasizing the detrimental effects of these psychological states on athletic success.
5. Effective management of psychological factors is crucial for enhancing performance. Addressing negative psychological states and promoting positive ones can help optimize athletic outcomes.

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