ISSN Print: 2664-7559
ISSN Online: 2664-7567
IJSHPE 2024; 6(1): 265-268
www.physicaleducationjournal.in
Received: 18-03-2024
Accepted: 22-04-2024

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Examining sports competitive anxiety among female basketball players at different competition levels

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DOI: https://doi.org/10.33545/26647559.2024.v6.i1d.135

Abstract
This study explored the dynamics of sports competitive anxiety among female basketball players at different competition levels, aiming to find variations in anxiety levels across these groups. Anxiety in sports is a prevalent phenomenon influenced by numerous factors, including competition expectations, performance pressures, and individual psychological characteristics. While existing literature acknowledges the impact of anxiety on athletic performance, few studies have specifically examined anxiety levels among basketball players at various competition levels. This research addresses this gap by employing the Sports Competition Anxiety Inventory (SCAT) to measure anxiety levels among 105 female basketball players divided into National, Inter-College, and State-level groups. Descriptive statistics and ANOVA tests reveal significant differences in anxiety levels among the three groups. Post hoc Tukey HSD tests confirm that State-level players exhibit the highest anxiety levels, followed by Inter-College and National-level players. These findings highlight the importance of recognizing and addressing anxiety in athletes to optimize performance and well-being. Targeted interventions aimed at enhancing psychological skills and emotional regulation strategies may help mitigate anxiety levels and improve performance outcomes in female basketball players across different competition levels.

Keywords: Sports competitive anxiety, female basketball players, anxiety levels

Introduction
Competition has become so integral to today's society that athletes face immense pressure, regardless of their abilities, reasons for participation, or skill levels. These conditions often impose significant stress on competitors. Anxiety, defined as feelings of nervousness and tension caused by environmental or situational expectations related to arousal, can create a challenging imbalance between the demands placed on athletes and their ability to meet these expectations (Gould, Greenleaf, & Krane, 2002) [29]. Over the years, enhancing performance has become a fundamental aspiration for athletes, who dedicate extensive time and effort to improve their skills and talents. According to Coakley (2007) [30], many athletes involved in exclusive or elite teams spend entire years training intensively, aiming to secure scholarships or reach professional levels, thereby fostering high hopes among athletes, their parents, and coaches. However, these high expectations can also elevate stress levels, closely linking heightened aspirations with increased anxiety.

Given that the interpretation of anxiety symptoms significantly influences performance and elite status in sports, identifying specific psychological skills that help athletes perceive their anxiety as normal and facilitative is crucial. While the sport psychology literature widely recognizes that mental skill training interventions effectively enhance performance and reduce anxiety (Greenspan & Feltz, 1989; Vealey, 1994; Weinberg & Comar, 1994) [5, 22, 24], few studies have specifically examined the effects of mental training on athletes' anxiety (Hanton *et al*., 1999; Dominikus *et al*., 2009; Aufenanger, 2005) [8, 3, 1].

A sports competition is a natural culmination of the training process, imposing a certain burden on athletes (Kaplánová, 2020) [11]. The experience of competition is highly individual. Some athletes verbalize the difficulties they encounter, while others exhibit physical symptoms such as restlessness, tremors, shortness of breath, heart palpitations, excessive sweating, or teeth grinding (Kaplánová, 2019a, 2019b, 2020; Fransen *et al*., 2014; Smith *et al*., 1995) [9, 10, 4, 19]. When performance does not progress as expected, athletes' bodies often respond more complexly to stress. This response manifests emotionally through fear, anxiety, anger, apathy, shame, guilt, or depressed moods (Kaplánová, 2021; Schlax *et al*., 2020; Waugh & Koster,

2015; Yu *et al*., 2022) [12, 18, 23, 27], and behaviorally through physical aggression, verbal attacks, or hypermobility (Yang *et al*., 2015) [26]. Indecisiveness or reduced ambition reflects interference in volitional processes (Gregor, 2013) [6]. Concentration disruption, memory inaccuracies, and intrusive thoughts impact cognitive functions (Kaplánová, 2019a; Kaplánová & Gregor, 2019; Lagos *et al*., 2008; Peper & Aita, 2017) [9, 10, 14, 17]. Increased muscle tone, restlessness, and movement abnormalities are motor indicators of stress, while physiological responses include increased breathing and pulse rates, and changes in appetite (Kaplánová, 2019a, 2020; Gregor, 2013; Dalecki *et al*., 2019) [9, 6, 2].

Emotions, particularly anxiety, play a critical role in performance outcomes (Uphill & Jones, 2011) [20]. Anxiety is strongly linked to negative performance outcomes in sports (Mellalieu *et al*., 2009) [15]. Effective regulation strategies are essential for managing intense anxiety (Wolf *et al*., 2014) [25], and athletes' emotional self-regulation is associated with improved performance (Uphill *et al*., 2009; Uphill & Jones, 2011) [21, 20]. Beyond individual emotion regulation, interpersonal emotion regulation involves the process of regulating others' emotions (Niven *et al*., 2011) [16], also known as extrinsic interpersonal regulation (Gross & Thompson, 2007; Zaki & Williams, 2013) [7, 28]. Niven (2017) [31] described interpersonal emotion regulation as a distinct process with four key characteristics: it aims at changing or maintaining a state to achieve certain goals, targets affective states, is a conscious and deliberate process, and has a social target. Strategies may improve or worsen others' emotions, such as listening, changing perceptions, distracting (affect-improving), or criticizing and complaining (affect-worsening) (Niven *et al*., 2011) [16]. Despite well-established associations between anxiety, emotional self-regulation, and performance in sport psychology, research examining the relationships between emotional self-regulation, interpersonal emotion regulation, and performance outcomes remains scarce.

This research aims to compare anxiety levels among basketball players at three competitive levels: National (Group A, n=35), Inter-College (Group B, n=35), and State (Group C, n=35). Data will be collected using the Sports Competition Anxiety Inventory to provide insights into the psychological and emotional dynamics of athletes across different competitive environments.

Selection of subjects

In this study, 105 female basketball players aged 18 to 25 were recruited and divided into three groups: Group A - National Level (n1=35), Group B - Inter-College Level (n2=35), and Group C - State Level (n3=35). The inclusion criteria required that all participants be free from any acute or chronic physical conditions that could impair their ability to fully engage in the study. This careful selection process aimed to create a homogeneous sample of healthy individuals, thereby minimizing variability due to health-related factors and enhancing the reliability and validity of the study outcomes.

Selection of test

Sports competition anxiety

Description of the Test: The Sports Competition Anxiety Inventory (SCAT), developed by Martens in 1977, was utilized to measure the athletes' levels of competitive anxiety. The adult form of SCAT was employed in this study. This inventory consists of 15 statements pertaining to competitive situations, which the athlete responds to by selecting one of three options: 'hardly ever,' 'sometimes,' or 'often.' Each item is marked with a tick (✓) corresponding to the athlete's chosen response. This tool is designed to provide an accurate assessment of an athlete's anxiety in competitive contexts.

Table 1: Sports Competition Anxiety Test

Sr. No.	Range of Scores	Interpretation
1.	1-10	Low Anxiety level
2.	11-20	Optimum Anxiety Level
3.	21-25	Above average anxiety level
4.	Above 25	Extreme Anxiety level

Aim of study

The aim of this study is to compare the sports competitive anxiety levels among basketball players at different levels of competition: National Level (n1=35), Inter-College Level (n2=35), and State Level (n3=35).

Hypothesis

Null Hypothesis (H_0): There is no significant difference in sports competitive anxiety levels among female basketball players at different competition levels (National, Inter-College, and State levels).

Alternative Hypothesis (H_1): There is a significant difference in sports competitive anxiety levels among female basketball players at different competition levels (National, Inter-College, and State levels).

Statistical Treatment

Descriptive statistics, including the mean and standard deviation, were calculated to summarize the data. An ANOVA test was conducted to compare the three groups, and if the results were significant, a post hoc Tukey HSD test was applied. All statistical analyses were performed using SPSS software to ensure accurate and reliable results.

Results

Table 2: Descriptive Statistics of Sports Competitive Anxiety Levels.

Data Summary				
Groups	**N**	**Mean**	**Std. Dev.**	**Std. Error**
National Level	35	15.0857	2.1195	0.3583
Inter-College Level	35	17.1714	2.0217	0.3417
State Level	35	20.4571	2.7153	0.459

This table presents the descriptive statistics for the sport's competitive anxiety levels among basketball players at different competition levels. The National Level group had a mean anxiety score of 15.0857 with a standard deviation of 2.1195. The Inter-College Level group had a mean score of 17.1714 with a standard deviation of 2.0217. The State Level group had the highest mean score of 20.4571 with a standard deviation of 2.7153. The standard error for each group indicates the precision of the mean estimates.

Table 3: ANOVA Results.

ANOVA Summary					
Source	**Degrees of Freedom DF**	**Sum of Squares SS**	**Mean Square MS**	**F-Stat**	**P-Value**
Between Groups	2	513.3089	256.6545	48.2663	0
Within Groups	102	542.3818	5.3175		
Total:	104	1055.6907			

The ANOVA results indicate a significant difference in sports competitive anxiety levels among the three groups (National Level, Inter-College Level, and State Level) of basketball players. The between-groups sum of squares (SS) is 513.3089, with 2 degrees of freedom (DF), leading to a mean square (MS) of 256.6545. The within-groups SS is 542.3818, with 102 DF, resulting in an MS of 5.3175. The F-statistic is 48.2663, and the p-value is less than 0.001, indicating a statistically significant difference in anxiety levels between the groups.

The p-value is <.00001. The result is significant at p <.05. Given the significant ANOVA result, it is appropriate to conduct a post hoc Tukey HSD test to identify which specific groups differ from each other. The f-ratio value is 48.26517.

Table 4: Post Hoc Tukey HSD, Pairwise Comparisons.

Pairwise Comparisons		**$HSD_{.05}$ = 1.3111 $HSD_{.01}$ = 1.6427**	**$Q_{.05}$ = 3.3636 $Q_{.01}$ = 4.2143**
National Level: Inter-College Level	M_1 = 15.09 M_2 = 17.17	2.09	Q = 5.35 (*p* =.00076)
National Level: State Level	M_1 = 15.09 M_3 = 20.46	5.37	Q = 13.78 (*p* =.00000)
Inter-College Level: State Level	M_2 = 17.17 M_3 = 20.46	3.29	Q = 8.43 (*p* =.00000)

National Level vs. Inter-College Level

- Mean anxiety scores: National Level (M1 = 15.09), Inter-College Level (M2 = 17.17)
- The mean difference is 2.09, with a Q-statistic of 5.35 (p = 0.00076).
- This indicates a significant difference in anxiety levels between National Level and Inter-College Level players.

National Level vs. State Level

- Mean anxiety scores: National Level (M1 = 15.09), State Level (M3 = 20.46)
- The mean difference is 5.37, with a Q-statistic of 13.78 (p = 0.00000).
- This indicates a significant difference in anxiety levels between National Level and State Level players.

Inter-College Level vs. State Level

- Mean anxiety scores: Inter-College Level (M2 = 17.17), State Level (M3 = 20.46)
- The mean difference is 3.29, with a Q-statistic of 8.43 (p = 0.00000).
- This indicates a significant difference in anxiety levels between Inter-College Level and State Level players.

Overall, the post hoc Tukey HSD test confirms that there are significant differences in sports competitive anxiety levels among all three groups of basketball players, with the State Level players exhibiting the highest anxiety levels, followed by Inter-College Level players, and National Level players having the lowest anxiety levels.

Conclusion

This study investigated sports competitive anxiety among female basketball players at different competition levels: National, Inter-College, and State levels. The results indicated significant differences in anxiety levels among these groups. State-level players exhibited the highest anxiety levels, followed by Inter-College level players, with National level players reporting the lowest anxiety levels.

The findings underscore the importance of recognizing and addressing anxiety in athletes, as it can significantly impact performance and overall well-being. Understanding the psychological dynamics of athletes across different competitive environments is crucial for developing targeted interventions to manage anxiety and optimize performance.

Moving forward, interventions aimed at enhancing athletes' psychological skills and emotional regulation strategies may help mitigate anxiety levels and improve performance outcomes. Additionally, further research exploring the underlying factors contributing to anxiety in sports and evaluating the effectiveness of interventions is warranted to better support athletes in achieving their full potential.

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