

The impact of anxiety on competitive performance among female soccer players

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Abstract:

Background: Anxiety is a multidimensional concept that considerably influences athletic performance in sport. Compared to male athletes, female soccer players often report higher levels of anxiety and face unique challenges and stressors that may contribute to these elevated levels. Although this has been reported, research specifically focusing on female university players in South Africa remains limited. This study examined the level of anxiety among female university soccer players and its impact on their competitive performance. **Methods:** A quantitative, cross-sectional design was used, involving 34 female soccer players ($M_{age} = 24.85$, $SD \pm 3.79$), primarily Black (Black = 91%; Colored = 9%), competing at university and national levels. Participants completed 2 questionnaires: the Competitive State Anxiety Inventory-2 (CSAI-2) and the Sport Anxiety Scale (SAS), which assessed dimensions of anxiety and self-confidence. Quantitative data were analyzed using descriptive and inferential statistics, including paired-sample t-tests, ANOVA, and multiple regression analysis. **Results:** Participants reported moderate levels of cognitive anxiety ($M = 2.61$), somatic anxiety ($M = 2.30$), and self-confidence ($M = 2.49$). No significant differences in anxiety were found across playing positions ($p > 0.05$). However, a significant difference in state anxiety during gameplay was observed based on years of experience ($p = 0.013$). Regression models revealed that state anxiety was a strong predictor of performance ($R^2 = 0.686$, $p < 0.001$), with pre-game and mid-game anxiety acting as significant positive predictors ($\beta = 0.46$ and $\beta = 0.55$, respectively). In contrast, post-game anxiety was a negative predictor of performance ($\beta = -0.31$, $p = 0.028$). **Conclusion:** This study highlights that anxiety can be facilitative and can enhance performance before and during competition. However, the negative impact of post-game anxiety indicates a critical need for psychological recovery interventions. This research addresses an important gap in the literature by contributing to the understanding of how anxiety affects the performance of female athletes and by recommending actionable interventions to improve their performance.

Keywords: Competitive anxiety, Female Soccer, Sport performance, Sport Psychology, South Africa, Performance Prediction, CSAI-2

Introduction

There are anxiety-related responses that can meaningfully influence performance outcomes, especially in a fast-paced team sport such as soccer, which requires rapid decision-making, sustained attention, and precise motor execution (Kaur et al., 2025). Anxiety is a multidimensional concept involving both psychological and physiological components (Chang et al., 2025; Zhang et al., 2018). These components include concepts such as fear of failure and reduced concentration, as well as increased heart rate and muscle tension. Elevated anxiety levels can also affect team dynamics, such as communication and coordinated decision-making, which may contribute to inconsistencies in performance (Marwat et al., 2021; Khan et al., 2017).

These responses may contribute to competitive anxiety in sport, which can be triggered particularly by high-stakes settings such as matches and tournaments (Bukhari et al., 2015). Competitive anxiety is a common psychological phenomenon that exerts a complex effect on performance and is consistently associated with poorer athletic performance outcomes (Mojtahedi et al., 2023; Hardie et al., 2022; Bukhari et al., 2015). Moreover, researchers differentiate between state anxiety, an unpredictable emotional response to situational pressures, and trait anxiety, which is a stable tendency to perceive competition as inherently threatening (Martínez et al., 2024; Weinberg & Gould, 2023).

Anxiety does not affect performance entirely negatively. Researchers have found that moderate levels of anxiety can be beneficial, enhancing alertness, increasing motivation, and improving task engagement (Ford et al., 2017). However, they also found that if anxiety exceeds an athlete's perceived coping capacity, it may become disruptive, impairing confidence, coordination, and decision-making (Weinberg & Gould, 2023; Ford et al., 2017). Therefore, while some degree of anxiety may sharpen focus, excessive anxiety often leads to a decline in overall effectiveness.

Focusing specifically on female athletes, these athletes face unique anxiety triggers rooted in sociocultural pressures. They experience this especially in traditionally male-dominated sports such as soccer (Ruiz-Esteban et al., 2020; Feltz, 2016). At the university level, these triggers are intensified by the competitive environment of university sport and the need to balance academic performance with athletic roles (Contreras et al., 2023). Moreover, psychological strains are often exacerbated by gender stereotypes and the high stakes of university sports, such as maintaining scholarships and securing team selection (Knowlton & Newland, 2024; Li et al., 2023). Moreover, interpersonal pressures, such as the fear of disappointing peers and coaches, can negatively affect self-confidence (Nuetzel, 2023; Gustafsson et al., 2017). In addition to these cognitive stressors, sport-specific stressors unique to female players, including concerns about injuries and the physiological effects of the menstrual cycle, further complicate emotional regulation and physical readiness in these athletes (Adam et al., 2021; Ruiz-Esteban et al., 2020).

Despite growing research in sport psychology, empirical studies examining the impact of anxiety on female university athletes remain limited, particularly in the African context. This indicates an important gap in literature as it identifies when anxiety becomes facilitative or detrimental, and this can inform the timing and design of psychological interventions. This study, therefore, was undertaken to investigate the impact of competitive anxiety on performance among female university soccer players in South Africa. Specifically, this study examined cognitive anxiety, somatic anxiety, trait anxiety, and self-confidence, and evaluated how these affect soccer performance across different competitive phases. By providing context-specific evidence from South Africa, the findings aim to enrich the global literature on sports medicine and psychology. Ultimately, these insights will support the development of specialized strategies aimed at strengthening both the mental resilience and the competitive success of female soccer players.

Understanding these relationships has important practical implications for sport psychology and athlete development. The findings of this study may assist coaches, sport psychologists, strength and conditioning practitioners and university sport programmes in developing evidence-based psychological skills training, competition preparation strategies and post-match recovery interventions that enhance performance while protecting athletes' psychological wellbeing. Further, this study contributes context-specific evidence to the limited body of literature on female university athletes in South Africa and provide a foundation for future research aimed at improving mental performance support in women's soccer.

Materials and Methods

Study Design and Participants

This study used a quantitative cross-sectional design. Convenience sampling was used to select participants because this method provided access to the specific population of interest for the study.

Data Collection Tools

Two validated instruments were used for data collection: the Competitive State Anxiety Inventory-2 (CSAI-2) and the Sport Anxiety Scale (SAS). The CSAI-2 was used to assess state anxiety levels before and during competition, while the SAS measured trait anxiety across different athletic contexts. The questionnaires contained 27 and 21 items, respectively, and both used a 4-point Likert scale to evaluate the three components of anxiety. Participants took approximately 30 min to complete the questionnaires. The reliability of these tools was confirmed using Cronbach's Alpha (CA), and both have been recognized as valid and reliable measures in previous research (Bartholomeu & Montiel, 2014; Akman et al., 2025).

Procedure

The head coach was contacted to request permission to present the study to the team, and a time and date were scheduled. During the presentation, consent forms were provided to the participants, and written informed consent was obtained after 24 h to allow sufficient time for participants to decide whether to participate in the study. The researchers made sure participants understood that participation was voluntary and would have no impact on their team status. Data collection was performed in a designated quiet room. To ensure privacy and minimize peer influence, seating was arranged to provide adequate distance between participants. All participants completed the questionnaires independently and in person.

After completing the questionnaires, participants provided demographic data, including age and race, as well as sport-specific information detailing their experience and position. The researchers maintained anonymity by assigning each participant a unique identification number, and no identifying information was recorded. All data were securely stored and used only for reporting in this study.

Data Analysis

All raw data were entered and prepared in Excel, and the data analysis was performed using SPSS v.29.0. Descriptive statistics were used to summarize participant responses, with a focus on mean scores and variability in the CSAI-2 and SAS scales. A paired-sample t-test was performed to evaluate changes in anxiety levels from pre- to post-competition. In addition, ANOVA was used to assess whether anxiety levels differed significantly across independent variables, specifically playing positions and levels of experience. Additionally, multiple regression analysis was performed to assess the effect of anxiety on performance across different playing positions and years of experience.

Ethical Considerations

Ethical approval was obtained from the University Health Research Ethics Committee (Ref: REC-100118-054). The study complied with the Declaration of Helsinki and South African constitutional principles on voluntary participation and dignity. All participants provided written informed consent, and the data were anonymized to maintain confidentiality in accordance with the university's data protection standards.

Results

The study included 34 female soccer players, representing the institution's entire population of athletes actively competing at both university and national levels. The 100% response rate reflected comprehensive participant engagement. Table 1 below presents the participants' demographics, including age and race. To further describe the participants' characteristics, years of playing experience and playing positions were analyzed.

Table 1: Participant Demographics

Characteristic	Category	n	%	Mean (SD)	Range
Age (years)	—	34	100	24.85 (3.79)	19–34
Race	Black African	31	91.2	—	—
	Colored	3	8.8	—	—
Experience (years)	—	34	100	10.00 (5.72)	2–22
Playing Position	Defender	11	32.4	—	—
	Forward	10	29.4	—	—
	Midfielder	10	29.4	—	—
	Goalkeeper	3	8.8	—	—

As shown in Table 1, the participants were predominantly Black African (91.2%), with a mean playing experience of 10 years (SD = 5.72). This high standard deviation underscores the significant variation in competitive backgrounds within the team. Notably, the participants represented a diverse range of playing positions, offering a comprehensive overview of the team's composition. Defining these roles is essential to explore whether positional demands interact with anxiety to influence competitive performance.

Levels of Anxiety and Self-Confidence

A comparative analysis of the three CSAI-2 subscales showed that the players experienced the highest levels of Cognitive State Anxiety (M = 2.61, SD = 1.01), followed by State Self-Confidence (M = 2.49, SD = 1.00), and Somatic State Anxiety (M = 2.30, SD = 0.98). As shown in Table 2 below, all three dimensions fell within a moderate range, suggesting a balanced psychological state in which high mental engagement and performance-related concern coexist with substantial athletic self-assurance.

Table 2: Summary of the Multidimensional State Anxiety (CSAI-2)

Subscale	Mean (M)	Standard Deviation (SD)	Level
Cognitive Anxiety (CSA)	2.61	1.01	Moderate
Self-Confidence (SC)	2.49	1.00	Moderate
Somatic Anxiety (SSA)	2.30	0.98	Moderate

Below is a more detailed breakdown of the three CSAI-2 subscales.

Cognitive state of anxiety

The cognitive component of state anxiety, reflecting the mental indicators of pressure, showed a moderate overall mean of 2.61 (SD = 1.01).

Table 3: Cognitive State Anxiety (CSA)

CSA items	Mean	SD
I am concerned about this level of performance	2.939	0.966
I have self-doubts	2.061	0.899
I am concerned that I may not perform as well as I could	3.061	1.223
I am concerned about losing or performing poorly	2.909	1.156
I am worried about doing well	2.576	0.969
I am concerned about performing poorly	2.788	1.083
I am worried about reaching my goal	2.667	1.021
I am concerned that others will be disappointed with my performance	2.273	0.944
I am concerned I will not be able to focus	2.242	0.867
Overall score	2.613	1.014

Table 3 indicated that the highest-rated concern among players was the fear of not performing up to their potential (I am concerned I may not do as well... $M = 3.06$, $SD = 1.22$), followed closely by concerns about performance anxiety ($M = 2.94$, $SD = 0.97$). It is important to note that the item regarding “self-doubt” received the lowest mean score ($M = 2.06$, $SD = 0.90$), suggesting that although these athletes experience substantial performance-related worry, their underlying belief in their own ability remains relatively intact.

Somatic State Anxiety

Several questions regarding Somatic State Anxiety (SAS) were asked to assess the players’ physiological responses to competitive pressure. Table 4 highlights the distribution of SAS among participants.

Table 4: Somatic State Anxiety (SSA)

SSA items	Mean	SD
I feel nervous	2.546	1.063
I feel jittery	2.182	0.983
My body feels tense	2.333	0.957
I feel tension in my stomach	2.030	0.847
My body feels relaxed	2.515	1.004
My heart is racing	2.636	1.113
I feel my stomach sinking	2.121	0.927
My hands are clammy	2.030	0.918
My body feels tight	2.303	0.984
Overall score	2.300	0.977

The players reported a moderate level of somatic anxiety ($M = 2.30$, $SD = 0.98$), which reflects their physiological response to competitive pressure. The most prevalent physical symptoms were a racing heart ($M = 2.64$, $SD = 1.11$) and general feelings of nervousness ($M = 2.55$, $SD = 1.06$). Interestingly, lower scores were observed for gastrointestinal distress, such as “I feel my stomach sinking” and a tense stomach.

Despite these physiological markers of arousal, players maintained a moderate sense of physical relaxation ($M = 2.52$, $SD = 1.00$), indicating a complex relationship between heightened arousal and composed physical states.

Self-Confidence

The descriptive statistics for the Self-Confidence items are summarized in Table 5, providing an overview of the players’ self-confidence levels.

Table 5: Self-Confidence (SC)

SC items	Mean	SD
I feel at ease	1.939	0.899
I feel comfortable	2.333	0.777
I feel self-confident	3.000	1.414
I feel secure	2.303	0.918
I am confident that I can meet this challenge	2.758	0.867
I am confident about performing well	2.727	1.039
I feel mentally relaxed	2.091	0.980
I am confident because I mentally picture myself reaching my goal	2.667	1.021
I am confident of coming through under pressure	2.606	1.088
Overall score	2.492	1.000

Self-confidence scores indicated a moderate overall level of assurance among the participants ($M = 2.49$, $SD = 1.00$). Players reported relatively high levels of explicit self-confidence ($M = 3.00$, $SD = 1.41$) and confidence in meeting the competitive challenge ($M = 2.76$, $SD = 0.87$), but lower levels of mental ease ($M = 1.94$). This pattern suggests a “performance-ready” state in which strong confidence coexists with incomplete mental relaxation (Table 3).

The substantial variability in responses to the item “I feel self-confident” ($SD = 1.41$) further indicates significant individual differences in how securely players perceive their abilities under competitive pressure.

Pre-Game vs. Post-Game Anxiety

A paired-samples T-test was performed to evaluate changes in both state and trait anxiety before and after the game. As summarized in Table 6 below, no statistically significant differences were observed pre- and post-game.

Table 6: Comparison of Anxiety Levels Before and After the Game

		Paired Differences					t	df	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				Two-Sided p
					Lower	Upper			
CSAI-2	Before–After	−0.151	1.186	0.203	−0.565	0.262	−0.744	33	0.462
SAS	Before–After	0.085	0.856	0.147	−0.214	0.383	0.576	33	0.569

For state anxiety (CSAI-2), even though there was a nominal decrease in mean scores post-game, this change was not statistically significant ($p = 0.462$). Similarly, trait anxiety (SAS) scores remained the same from pre- to post-game, with no statistically significant variance recorded ($p = 0.569$). These results indicate that anxiety levels among the participants remained moderately consistent throughout the competitive event, suggesting a sustained psychological load that continued beyond the final whistle.

Anxiety and Playing Position

A one-way ANOVA was performed to compare the mean competitive anxiety levels (state and trait) across the four playing positions (defenders, forwards, midfielders, and goalkeepers).

Table 7: ANOVA Results for CSAI-2 and SAS Anxiety Levels by Playing Position

	Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.
CSAI-2 anxiety before the game	Between Groups	1.011	3	.337	.797	.505
	Within Groups	12.685	30	.423		
	Total	13.695	33			
CSAI-2 anxiety during the game	Between Groups	1.308	3	.436	1.007	.403
	Within Groups	12.988	30	.433		
	Total	14.296	33			
CSAI-2 anxiety after the game	Between Groups	.913	3	.304	.653	.587
	Within Groups	13.978	30	.466		
	Total	14.890	33			
SAS anxiety before the game	Between Groups	.008	3	.003	.007	.999
	Within Groups	11.686	30	.390		
	Total	11.693	33			
SAS anxiety after the game	Between Groups	2.292	3	.764	1.600	.210
	Within Groups	14.326	30	.478		
	Total	16.618	33			
SAS anxiety during the game	Between Groups	.566	3	.189	.735	.540
	Within Groups	7.699	30	.257		
	Total	8.265	33			

As shown in Table 7, the results indicated no statistically significant differences in CSAI-2 state anxiety before the game [$F(3, 30) = 0.80$, $p = 0.505$], during the game [$F(3, 30) = 1.01$, $p = 0.403$], or after the game [$F(3, 30) = 0.65$, $p = 0.587$]. Similarly, SAS trait anxiety remained consistent across all positional groups throughout the competition phases, with no significant variation recorded before [$F(3, 30) = 0.01$, $p = 0.999$], during [$F(3, 30) = 0.74$, $p = 0.540$], or after the game [$F(3, 30) = 1.60$, $p = 0.210$].

These findings indicate that the specific tactical demands of a player’s position do not significantly affect the intensity of anxiety experienced by these participants.

Anxiety and the Playing Experience

A one-way ANOVA was performed to evaluate the effect of playing experience on levels of competitive anxiety.

Table 8: ANOVA Results for CSAI-2 and SAS Anxiety Levels by Years of Playing

		Sum of Squares	Df	Mean Square	F	Sig.
CSAI-2 anxiety before the game	Between Groups	7.064	17	.416	1.003	.500
	Within Groups	6.631	16	.414		
	Total	13.695	33			
CSAI-2 anxiety during the game	Between Groups	11.008	17	.648	3.151	.013
	Within Groups	3.288	16	.205		
	Total	14.296	33			
CSAI-2 anxiety after the game	Between Groups	4.630	17	.272	.425	.955
	Within Groups	10.260	16	.641		
	Total	14.890	33			
SAS anxiety before the game	Between Groups	5.196	17	.306	.753	.717
	Within Groups	6.498	16	.406		
	Total	11.693	33			
SAS anxiety after the game	Between Groups	9.511	17	.559	1.259	.324
	Within Groups	7.107	16	.444		
	Total	16.618	33			
SAS anxiety during the game	Between Groups	3.197	17	.188	.594	.852
	Within Groups	5.067	16	.317		
	Total	8.265	33			

As shown in Table 8, the analysis revealed no significant differences in trait anxiety (SAS) or state anxiety (CSAI-2) during the pre-game and post-game phases ($p > .05$). However, a statistically significant difference was observed in state anxiety during the game based on years of playing experience, $F(17, 16) = 3.15$, $p = .013$.

This finding indicates that the length of an athlete's career significantly influences their psychological response during active gameplay, whereas it appears to have a negligible effect on anxiety levels before or after the match.

Performance Predictors: State Anxiety (CSAI-2)

A multiple regression analysis was performed to determine the extent to which state anxiety levels (before, during, and after competition) predicted performance outcomes. The model was statistically significant ($p < 0.001$) and accounted for 68.6% of the variance in performance ($R^2 = 0.686$; adjusted $R^2 = 0.655$).

Table 9: Multiple Regression Analysis of Performance Outcomes and CSAI Anxiety Levels

R	R-squared	Adjusted R-squared	Std. Error of the Estimate		
.829 ^a	.686	.655	.41239		
ANOVA ^a					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.171	3	3.724	21.895	<.001 ^b
Residual	5.102	30	.170		
Total	16.273	33			
Coefficients ^a					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	.794	.626		1.268	.215
Anxiety before	.500	.143	.459	3.505	.001
Anxiety during	.586	.111	.549	5.300	<.001
Anxiety after	-.320	.138	-.306	-2.314	.028

As shown in Table 9, both pre-game anxiety ($\beta = 0.46$, $p = 0.001$) and mid-game anxiety ($\beta = 0.55$, $p < 0.001$) were significant positive predictors of performance.

This indicates that higher levels of state anxiety during these phases were associated with positive performance outcomes. In contrast, post-game anxiety was a significant negative predictor ($\beta = -0.31$, $p = 0.028$), suggesting that higher anxiety after the match was associated with poorer performance results.

Performance Predictors: Trait Anxiety (SAS)

A second regression analysis was performed to assess the predictive power of trait anxiety (SAS) on performance.

Table 8: Multiple Regression Analysis of Performance Outcomes and SAS Anxiety Levels

R	R-squared	Adjusted R-squared	Std. Error of the Estimate		
.690 ^a	.476	.423	.45808		
ANOVA ^a					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.714	3	1.905	9.077	<.001 ^b
Residual	6.295	30	.210		
Total	12.009	33			
Coefficients ^a					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	.763	.410		1.864	.072
Anxiety before	.583	.146	.575	3.982	<.001
Anxiety during	.372	.238	.309	1.565	.128
Anxiety after	−.184	.157	−.217	−1.169	.252

According to Table 8, this model was also significant ($p < 0.001$), explaining 47.6% of the variance ($R^2 = 0.476$). However, the only significant individual predictor was pre-game trait anxiety ($\beta = 0.58$, $p < 0.001$). Anxiety levels during ($p = 0.128$) and after ($p = 0.252$) the match did not significantly contribute to the model, suggesting that an athlete's general tendency toward anxiety before a match is the primary trait-based driver of performance.

Discussion

This study examined the impact of anxiety on competitive performance among female university soccer players. The findings of the study provide a multidimensional look at how mental and physical arousal interact with experience and tactical roles in the South African sporting context.

Cognitive Anxiety, Somatic Anxiety, and Self-Confidence

Participants showed moderate levels of cognitive state anxiety ($M = 2.61$), somatic anxiety ($M = 2.30$), and self-confidence ($M = 2.49$). These findings support the Multidimensional Theory of Competitive Anxiety (Martens et al., 1990), which suggests that these constructs are different yet interrelated. Notably, concern about "performing to potential" was high ($M = 3.06$), contrasting with relatively low self-doubt ($M = 2.06$). This suggests that, for these participants, anxiety does not reflect a lack of belief in their ability but rather indicates that they care deeply about the outcome, leading to situational worry.

Stability Across the Competitive Timeline

Another interesting finding was the lack of significant change in anxiety levels before and after the game. While typical athletic models suggest an anticipatory spike followed by a post-game drop (Hagan et al., 2017), these players maintained a steady psychological state. The stability of the trait anxiety (SAS) scores ($p = 0.569$) confirms the reliability of the instrument because trait anxiety is a stable personality characteristic. The lack of a significant drop in state anxiety after the game may point to a prolonged evaluation phase, in which university-level players continue to ruminate on their performance long after the final whistle.

Anxiety by Position and Experience

Some literature suggests that goalkeepers face unique psychological burdens (Ford et al., 2017). However, this study found no significant differences in anxiety across playing positions. This finding suggests a high level of team cohesion, with the psychological load of the match being shared equally across the team. Moreover, the ANOVA performed on years of experience revealed a significant result: experience significantly influenced state anxiety, specifically during gameplay ($p = 0.013$). This finding suggests that although players with varying levels of experience feel the same nervousness before the game begins, their ability to regulate anxiety while the ball is in play differs. This aligns with Hanin's (1995) IZOF model, which suggests that seasoned players likely develop functional zones that allow them to process in-game stress more effectively than their less experienced counterparts.

The Facilitative Power of Anxiety

The regression analysis yielded particularly important evidence. Both the CSAI-2 and SAS models significantly predicted performance, explaining 68.6% and 47.6% of the variance, respectively. It is also important to note that higher anxiety before and during the game was associated with better performance. This

finding challenges the traditional view of anxiety as having a purely negative impact on performance. Instead, it supports the Inverted-U Hypothesis and Catastrophe Theory (Hardy & Parfitt, 1991), suggesting that, for this cohort, anxiety acted as a facilitative factor by increasing focus and physiological readiness.

Contrary to the finding above, post-game anxiety was negatively related to performance ($p = 0.028$). Based on this finding, it can be suggested that poor performance leads to greater post-game distress and ongoing reflection on the game. This means that the psychological cost of a match may be highest for those who feel they underperformed, highlighting the need for better post-game emotional recovery strategies.

Conclusion

Taken together, the findings of this study suggest that anxiety among female university soccer players is not uniformly detrimental. Contrary to traditional models that consider anxiety as a distraction, the findings of this study support a facilitative interpretation of competitive stress, in which moderate levels of pre-game and in-game anxiety significantly and positively predicted better performance. While playing position did not appear to determine anxiety levels, playing experience served as a critical moderator of emotional regulation during the game.

A key finding of this study was that anxiety experienced before and during competition influenced performance positively, whereas anxiety experienced after the game influenced performance negatively. This finding challenges the traditional assumption that anxiety should always be minimized, instead supporting that moderate anxiety may facilitate improved performance by increasing concentration and physical readiness for the game. However, the finding that elevated post-game anxiety may reflect psychological distress highlights the importance of recovery strategies extending beyond physical recovery.

In practice, the findings above provide evidence that coaches, sport psychologists and university sport programs should consider ways to manage competitive anxiety. The focus must be on interventions that can assist athletes recognize and regulate anxiety so that it remains enhancing performance than limiting it. Athletes can be taught psychological skills such as goal setting, imagery, relaxation techniques, self-talk, and emotional regulation strategies, assisting them in maintaining optimal levels of competitive anxiety. Psychological distress can be managed by post-match debriefing and mental recovery sessions, further optimizing athlete wellbeing and long-term performance.

The findings of this study further provide theoretical context-specific evidence from South African female university soccer players, a population that remains under presented in the international sport psychology literature. The findings demonstrated that different phases during competition exert different psychological influences on performance, which extend the current understanding of the relationship between competitive anxiety and athletic performance within women's soccer. Even though this study has a limited sample from a single university, it sets a foundation for future research into larger studies involving athletes from different competitive levels, sports and cultural contexts. It further suggests future investigations into longitudinal changes in anxiety over sport seasons and effectiveness of targeted psychological interventions to improve the performance and wellbeing of athletes.

Overall, this study confirms that anxiety is an important component of the competitive drive among these participants. However, the negative correlation between post-game anxiety and performance underscores a psychological effect, suggesting that the mental demands of competition do not end at the final whistle. For these athletes, success was defined not by the absence of anxiety, but by the ability to remain within an optimal zone of functioning.

Limitations

While this study provides valuable insights into the relationship between anxiety and competitive performance among female university soccer players, as well as into a traditionally under-researched demographic, several limitations should be taken into account when interpreting the findings.

First, the study focused on a single university in the Eastern Cape. While this provides contextual value, the small sample size ($N = 34$) and specific geographic location may limit the generalizability of the findings to professional or international female cohorts. The study relied on self-report measures (CSAI-2 and SAS), which may introduce social desirability bias because athletes may underreport anxiety to appear mentally tough to peers or coaches. Lastly, although the regression models showed strong predictive power, the relationship between post-game anxiety and performance is likely bidirectional, with poor performance potentially causing post-game distress rather than the reverse.

Despite these limitations, the study still makes a meaningful contribution to the limited body of research and highlights important directions for future studies using larger, more diverse samples and multimethod approaches.

Recommendations

Based on these findings, the following interventions and directions for future research are proposed for coaches, sport psychologists, and future studies.

Because anxiety before and during games was shown to be facilitative, interventions should not aim to eliminate pre-match anxiety. Instead, the focus should be on Psychological Skills Training (PST) designed to reframe anxiety as excitement or readiness. Given that experience significantly affects in-game anxiety regulation, pairing highly experienced players with newer players in training could accelerate the development of emotional resilience in younger athletes. Lastly, to address the negative impact of post-game anxiety, teams should implement structured cool-down periods that include mindfulness or performance reviews to reduce individual self-analysis.

Future research should assess the direction of anxiety, specifically whether athletes perceive it as helpful or harmful, rather than focusing only on its intensity. Investigating anxiety across an entire competitive season would show how major games compared with friendly games influence these psychological markers. Combining quantitative data with qualitative interviews would offer a deeper understanding of the reasons behind racial and cultural differences in anxiety in South African sports.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT (Open AI) to support text refinement and academic writing. Following the use of this tool, all generated content was carefully reviewed and edited by the author, who assumes full responsibility for the accuracy and integrity of the final publication. No generative AI tools were used for data collection, data analysis, interpretation of results, or generation of scientific conclusions.

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