Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XXIV, ISSUE 2 Supplement, 2024, Romania
The journal is indexed in: ERIH PLUS, Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XXIV, ISSUE 2 Supplement, 2024
September 2024, 24 (2): 320-324
Original article

COGNITIVE ANXIETY, INTRAPERSONAL AND INTERPERSONAL INTELLIGENCE IN WOMEN SOCCER PLAYERS: A DESCRIPTIVE-CORRELATIONAL STUDY

TRANDAFIRESCU ELENA-ANDREEA[1], POTOP VLADIMIR[2,1,3]

Abstract

Aim. The aim of this study is to explore the relationship between cognitive anxiety, intrapersonal intelligence, and interpersonal intelligence in female soccer players, and to gain insight into how these psychological factors impact performance across different playing positions in women's soccer.

Methods. This research utilized a descriptive-correlational design. The sample comprised 16 female soccer players (N = 16), including goalkeepers, defenders, strikers, and midfielders, with a mean age of 15 years. To assess the psychological characteristics of the participants, the Competitive State Anxiety Inventory-2 (CSAI-2) was employed to measure cognitive anxiety, while the Emotional Intelligence Questionnaire (INEM) was used to collect data on intrapersonal and interpersonal intelligence, focusing on these specific psychological traits.

Results. The data indicate a significant negative association between cognitive anxiety and intrapersonal intelligence, suggesting that higher levels of cognitive anxiety are linked to lower levels of intrapersonal intelligence. Conversely, the relationship between cognitive anxiety and interpersonal intelligence appears weak and statistically non-significant. Additionally, the data reveal that Strikers have the highest levels of cognitive anxiety, while Defenders exhibit the lowest. Regarding intrapersonal intelligence, Strikers score the highest, whereas Goalkeepers score the lowest. For interpersonal intelligence, Midfielders have the highest scores, whereas Goalkeepers have the lowest.

Conclusions. Our findings imply that while interventions aimed at reducing cognitive anxiety might enhance emotional self-regulation, they may not necessarily improve a player's interpersonal skills. Also, the findings from this study appear to offer valuable insights into the psychological profiles of football players in different positional roles. Strikers and Midfielders, while seemingly demonstrating[4] high levels of both interpersonal and intrapersonal intelligence, tend to face considerable cognitive anxiety. Defenders, with their relatively lower cognitive anxiety, seem to exhibit moderate intrapersonal intelligence and strong interpersonal skills. Goalkeepers, while showing similar levels of cognitive anxiety to midfielders, appear to face challenges in intrapersonal intelligence, though they score relatively high in interpersonal intelligence. Overall, these psychological dimensions may inform tailored training and support strategies that could help optimize player performance across different positions.

Keywords: Cognitive anxiety, intrapersonal intelligence, women soccer, women football, sport psychology.

Introduction

Women's soccer has surged in popularity on the global stage**.** To excel both on and off the field, football players must effectively manage their anxiety and stress, as emotional regulation profoundly influences their dedication, reflected in their commitment, energy, and enthusiasm towards the sport (Galán-Arroyo, Gómez-Paniagua, Castillo-Paredes & Rojo-Ramos, 2024). Anxiety, an emotional response characterized by tension, anxious thoughts, and physiological effects such as elevated blood pressure, differs from fear, despite the terms often being used interchangeably (APA Dictionary of Psychology, 2018a). Cognitive anxiety, specifically, pertains to the mental dimension of anxiety, driven by negative expectations concerning success or self-critical thoughts (Martens, Vealey & Burton, 1990a). In football, managing this stress effectively is crucial for maintaining performance levels and emotional balance. Emotional intelligence is the capacity to recognize, understand, and manage emotions, both one's own and those of others, which facilitates personal growth and well-being (APA Dictionary of Psychology, 2018b). Emotional intelligence encompasses both personal and social awareness. Personal awareness includes self-awareness and emotion regulation, which are essential for goal setting and self-reflection. Football players who develop these aspects of intelligence are better equipped to handle high-pressure situations and foster communication and collaboration within their teams. The influence of emotional intelligence on game strategy is well-documented, although its impact can vary between coaches and athletes (Bramley, Healy & Sarkar, 2024; Jowett, Wachsmuth, Boardley & Balduck, 2024; Soflu, Esfahani & Assadi, 2011). Mastery of emotional intelligence

[1] Doctoral School of Sport Science and Physical Education, National University of Science and Technology Politehnica Bucharest, University Center Pitești, Romania;
[2] Department of Physical Education and Sport, National University of Science and Technology Politehnica Bucharest, University Center Pitești, Romania; Corresponding author: vladimir_potop@yahoo.com;
[3] State University of Physical Education and Sport, Republic of Moldova.

involves establishing effective connections and communication with teammates and opponents. Individuals proficient in this domain cultivate relationships through transparent interactions in various contexts, not limited to competitive scenarios but extending to everyday interactions. Furthermore, the development of emotional intelligence in footballers, particularly in areas such as self-motivation and empathy, can provide a substantial competitive edge (Popovych, Lokhikh, Hrys, Pavliuk, Nosov & Zinchenko, 2023).

Objectives

The objective of this study is to determine whether there is a correlation between cognitive anxiety and both intrapersonal and interpersonal intelligence, and to understand how these psychological factors interact with the positional roles of female soccer players.

Methods

A group of 16 female football players (N=16) participated in this study (Age Mean = 15 years, Height Mean = 162.88 cm, Weight Mean = 56.88 kg, and BMI Mean = 21.38 kg/m²). The participants were selected from the women's football teams of the ACS Champions Football Club FC Argeș, Argeș County, Romania. Parental consent was required and obtained before starting the research, in accordance with the Declaration of Helsinki. Additionally, consent from the coaches and club management was obtained prior to commencing the study. The research was approved by the Ethics Committee of the Doctoral School of Physical Education and Sport Science (ID: 14/21.07.2024), National University of Science and Technology Politehnica Bucharest, University Center Pitești, Pitești, 110254 Romania.

The research was conducted between March 2024 and August 2024. The CSAI-2 and INEM questionnaires were used as data collection tools to evaluate cognitive anxiety and emotional intelligence. The Competitive State Anxiety Inventory-2 (Martens, Vealey & Burton, 1990b) questionnaire is widely recognized as a valuable research tool and continues to be utilized in studies related to sport anxiety (Li, Tang, Guo & Bu, 2023; García-Gonzálvez, López-Plaza & Abellán-Aynés, 2022; Liang et al., 2021). The CSAI-2 consists of 27 items measuring cognitive state anxiety, somatic anxiety, and self-confidence on a 4-point Likert scale (1 = "Not at all", 2 = "Somewhat", 3 = "Moderately so", and 4 = "Very much so"). The Emotional Intelligence (Constantin, 2022) questionnaire allows the assessment of emotional intelligence. The questionnaire contains 50 items with dichotomous response and ensures the assessment of 4 factors/facets of emotional intelligence (understanding of one's own personal emotions; 2. regulation of own emotions; 3. understanding the emotions of others 4. regulating the emotions of others) grouped into the two meta-factors: intrapersonal intelligence and interpersonal intelligence.

The inventories had no time limits, though they typically required 5-10 minutes to complete. The questionnaires were distributed to the participants, and instructions were provided beforehand. All female soccer players (N=16) were asked to complete the questionnaires independently, providing their responses without external influence. The collected data were tabulated, and a correlation analysis was conducted using DATAtab statistics software (DATAtab Team, 2023). A p-value of 0.05 was used to determine statistical significance in all analyses. Additionally, a bar chart was generated to visually represent the comparison between the obtained data sets. This chart offers a clear depiction of the differences in Cognitive Anxiety, Intrapersonal Intelligence, and Interpersonal Intelligence scores across the different player positions. By plotting these metrics, the chart provides a straightforward way to observe trends and patterns in anxiety and intelligence levels, allowing for a more accessible interpretation of the results.

Results

The results of the correlation analysis (Table 1) for the variables Cognitive Anxiety and INTRApersonal Intelligence are presented, including the correlation coefficient (r) and the p-value (p). The correlation coefficient of -0.64 signifies a strong negative relationship between Cognitive Anxiety and INTRApersonal Intelligence. This indicates that, overall, higher levels of Cognitive Anxiety are associated with lower levels of INTRApersonal Intelligence, and vice versa. The p-value is used to assess if the available data provides sufficient evidence to reject the null hypothesis.

Table 1. Correlation and Significance between Variables

	r	p
Cognitve Anxiety and INTRApersonal Intelligence	-0.64	.007
Cognitve Anxiety and INTERpersonal Intelligence	0.1	.725

The null hypothesis states that the correlation between Cognitve anxiety and INTRApersonal Intelligence in the population is zero. In most research, a p-value less than 0.05 is considered statistically significant. Here, the p-value of .007 is less than 0.05, which suggests that the correlation observed in the sample (r = -0.64) is unlikely to be due to chance.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XXIV, ISSUE 2 Supplement, 2024, Romania
The journal is indexed in: ERIH PLUS, Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

The null hypothesis that there is no correlation between Cognitve Anxiety and INTRApersonal Intelligence in the population is therefore rejected. The result of the Pearson correlation thus showed that there was a statistically significant correlation between Cognitve anxiety and INTRApersonal Intelligence, r (14) = -0.64, p = .007.

The results of the correlation analysis for the variables variables Cognitve Anxiety and INTERpersonal Intelligence (Table 1) indicates the strength and direction of the linear relationship between the two variables. The coefficient 0.1 suggests a negligible, positive correlation. This means that, generally, as Cognitve Anxiety increases, INTERpersonal Intelligence also tends to increase and vice versa. The null hypothesis states that the correlation between Cognitve anxiety and INTERpersonal Intelligence in the population is zero. The p-value of .725, greater than 0.05, suggests that the correlation observed in the sample (r = 0.1) is likely to be due to chance. The null hypothesis that there is no correlation between Cognitve anxiety and INTERpersonal Intelligence in the population is therefore not rejected. The result of the Pearson correlation thus showed that therewas no statistically significant correlation between Cognitve anxiety and INTERpersonal Intelligence, r (14) = 0.1, p = .725. The next step was to create a bar chart (Figure 1) to visually represent the results of cognitive anxiety, intrapersonal intelligence, and interpersonal intelligence, categorized by player positions on the field: Strikers, Midfielders, Defenders, and Goalkeepers.

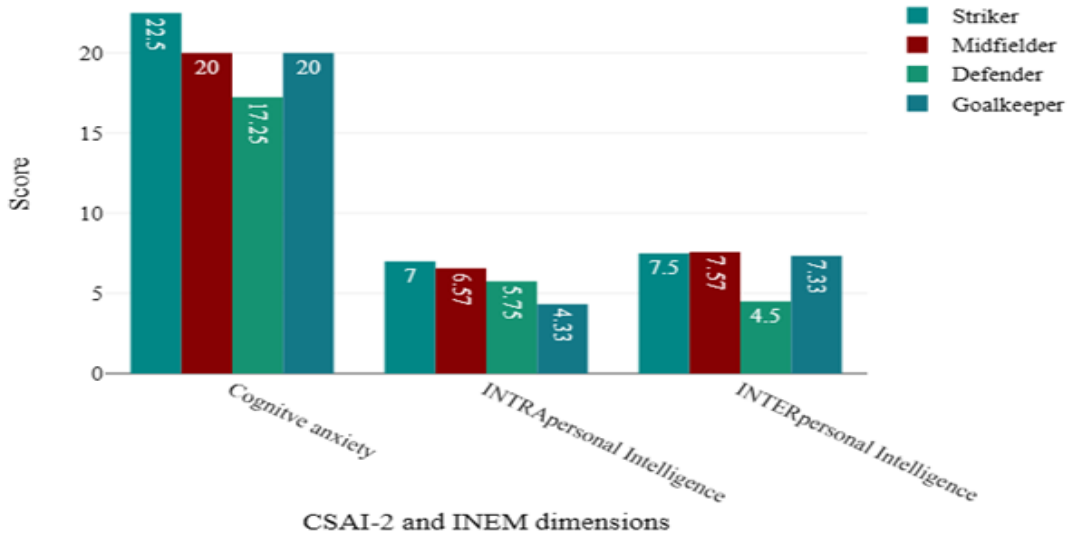

Figure 1. Measured Psychological Dimensions by Player Position

Since lower scores indicate better performance in cognitive anxiety, and higher scores indicate better performance in intrapersonal and interpersonal dimensions, these results provide insight into the strengths and weaknesses of each positional role. On the Cognitive Anxiety scale, strikers appear to exhibit the highest level of anxiety with a score of 22.5. Midfielders and Goalkeepers show similar levels, both scoring 20, while defenders display the lowest anxiety, with a score of 17.25. In terms of Intrapersonal Intelligence, strikers appear to lead with a score of 7, followed closely by Midfielders with 6.57. Defenders score 5.75, while Goalkeepers rank the lowest in this dimension, with a score of 4.33. On the Interpersonal Intelligence scale, Midfielders have the highest score of 7.57, tied with Strikers. Defenders follow with a score of 7.33, while Goalkeepers, with a score of 4.5, demonstrate the lowest level of interpersonal intelligence.

Discussions

The Pearson correlation analysis reveals a significant negative correlation between cognitive anxiety and intrapersonal intelligence (r = -0.64, p = .007). This suggests that higher levels of cognitive anxiety are associated with lower levels of intrapersonal intelligence. In other words, individuals who struggle more with cognitive anxiety might find it harder to manage their internal emotions effectively. This underscores the importance of intrapersonal emotional regulation skills in managing anxiety. Athletes with higher intrapersonal intelligence are likely better equipped to handle anxiety, which could help mitigate its negative effects on performance. Conversely, the correlation between cognitive anxiety and interpersonal intelligence is negligible and not statistically significant (r = 0.1, p = .725). This indicates that there is little to no relationship between cognitive anxiety and interpersonal intelligence. While skills such as communication and teamwork are crucial, they do not appear to directly influence anxiety levels. This finding suggests that improvements in interpersonal skills do not necessarily affect cognitive anxiety, and vice versa. Also, the analysis of cognitive anxiety, intrapersonal intelligence, and interpersonal intelligence across different football player positions reveals distinct patterns that provide valuable insights into the psychological profiles of these athletes.

Cognitive anxiety data indicates that Strikers experience the highest levels of cognitive anxiety (22.5), followed closely by Midfielders and Goalkeepers (20). This suggests that both positions face significant pressure, which may affect

their performance. Interestingly, Defenders report the lowest cognitive anxiety (17.25), indicating better emotional control and resilience under pressure. The high cognitive anxiety among strikers could be attributed to the crucial nature of their role, which often involves high-stakes situations and the need for decisive actions. Midfielders and Goalkeepers, while also facing pressure, might be slightly better at managing it due to their role's more dynamic nature, which involves continuous involvement in the game. Defenders, by contrast, might benefit from their more reactive role, allowing them to manage stress better.

Intrapersonal Intelligence data indicates that Strikers exhibit the highest intrapersonal intelligence (7), suggesting they possess strong self-awareness and emotional regulation skills despite their high levels of cognitive anxiety. This ability to manage internal emotions effectively likely helps them cope with the pressures of their role. Midfielders (6.57) also demonstrate robust intrapersonal intelligence, though slightly lower than strikers, indicating good self-regulation skills. Defenders (5.75) show lower intrapersonal intelligence, suggesting they are reasonably effective at managing their internal emotions but could benefit from further development in this area. Goalkeepers (4.33), with the lowest intrapersonal intelligence, may struggle with emotional regulation and self-awareness, which could impact their performance under stress. The high intrapersonal intelligence among strikers, despite their high cognitive anxiety, underscores their ability to control their emotions and maintain focus. Midfielders' slightly lower but still high intrapersonal intelligence highlights their competence in managing internal stressors. The lower scores for defenders and goalkeepers point to potential areas for development, particularly in enhancing emotional self-management.

Interpersonal Intelligence data indicates that Strikers (7.5) and Midfielders (7.57) demonstrate high interpersonal intelligence, which is crucial for effective communication and teamwork. This high level of interpersonal intelligence likely contributes to their ability to coordinate and collaborate effectively on the field. Defenders (7.33) also exhibit strong interpersonal skills but slightly less than midfielders and strikers. Goalkeepers (4.5), however, have the lowest interpersonal intelligence, suggesting challenges in communication and team integration, which may impact their performance during high-pressure situations. The high interpersonal intelligence of strikers and midfielders aligns with their roles that require frequent interaction and coordination. Defenders, while also possessing strong interpersonal skills, may need to further develop their communication abilities. Goalkeepers' lower scores in this dimension indicate a potential area for improvement, as better interpersonal skills could enhance their integration with the team and overall performance.

Conclusions

Although women's football is experiencing significant growth and a substantial body of research exists concerning men's sports, a notable gap persists in the scientific literature regarding female athletes. Current research on women's football has predominantly concentrated on physical characteristics and fitness profiles. However, there is a paucity of information on how psychological factors, such as cognitive measures, anxiety, emotions, or emotional intelligence, impact training stimuli, overall performance, or player profiles (Inside FIFA, 2024). Our study aims to bridge this gap by providing new insights into the relationship between psychological factors and athletic performance.

The results revealed a significant negative correlation between cognitive anxiety and intrapersonal intelligence, suggesting that players with higher levels of cognitive anxiety may encounter difficulties in managing their internal emotional states. This finding implies that interventions designed to enhance intrapersonal skills such as emotional regulation and self-awareness could potentially benefit athletes experiencing elevated cognitive anxiety. However, it is important to acknowledge that other factors may also influence anxiety levels and emotional regulation.

The negligible correlation between cognitive anxiety and interpersonal intelligence indicates that improvements in communication and teamwork skills may not have a direct impact on cognitive anxiety levels. This suggests that, while interpersonal skills are essential for effective team dynamics, they might operate independently of cognitive anxiety. Consequently, efforts to enhance interpersonal skills should be viewed as complementary to, rather than a replacement for, strategies aimed at managing cognitive anxiety.

In practical terms for professionals in women's football, the analysis suggests that implementing position-specific interventions could potentially enhance player performance and team dynamics. For Strikers, it may be beneficial to consider strategies focused on emotional regulation, given their higher levels of cognitive anxiety, while also capitalizing on their existing intrapersonal and interpersonal strengths. For Defenders, who exhibit lower cognitive anxiety and strong emotional resilience, continuing to support their current strategies might be advantageous. Goalkeepers, despite showing similar levels of cognitive anxiety as Midfielders but lower intrapersonal intelligence, could potentially benefit from tailored psychological support aimed at enhancing their intrapersonal skills and improving team integration.

While these recommendations are based on observed trends, it is important to remain open to the possibility that other factors could also influence outcomes and to adjust strategies accordingly. It is crucial to recognize several limitations of this study. The small sample size constrains the ability to generalize the findings to a broader population. Additionally, the limitations of the software used, as noted by its developers, should be taken into account. Future research should aim to increase participant numbers, ensure more balanced sample sizes across positional roles, and include a broader age range to enhance the reliability of the conclusions. Despite these limitations, these insights provide valuable guidance for developing position-specific psychological support and training programs that aim to optimize player performance through a deeper understanding of the interplay between cognitive anxiety, intrapersonal, and interpersonal intelligence.

Given the significant role that psychological attributes play in the performance of female football players, it seems essential to include a sports psychologist in both national and club teams (Kristjánsdóttir, Jóhannsdóttir, Pic & Saavedra, 2019).

Acknowledgements

We would like to express our sincere gratitude to the romanian ACS Champions Football Club FC Argeș and to the soccer players who took part in this research.

References

APA Dictionary of Psychology. (2018a). https://dictionary.apa.org/anxiety.

APA Dictionary of Psychology. (2018b). https://dictionary.apa.org/emotional-intelligence.

Bramley, O., Healy, L. C. & Sarkar, M. (2024). Mental ill-health in semi-elite women's soccer in England: a mixed-methods approach. *International Journal of Sport and Exercise Psychology* (pp. 1–20). Informa UK Limited. https://doi.org/10.1080/1612197x.2024.2311752.

Constantin, T. (2022). Emotional Intelligence Questionnaire (Chestionarul INteligenței EMoționale - INEM) and its psychometric characteristics (manuscript)

DATAtab Team (2023). DATAtab: Online Statistics Calculator. DATAtab e.U. Graz, Austria. URL https://datatab.net/.

Galán-Arroyo, C., Gómez-Paniagua, S., Castillo-Paredes, A. & Rojo-Ramos, J. (2024). Motivation, Anxiety, Life Satisfaction and Adherence in Spanish Adolescent Soccer Players. *Revista De Psicología Del Deporte* (*Journal of Sport Psychology*), 33(3), 26–36. Retrieved from https://mail.rpd-online.com/index.php/rpd/article/view/1761.

García-Gonzálvez, S., López-Plaza, D., & Abellán-Aynés, O. (2022). Influence of Competition on Anxiety and Heart Rate Variability in Young Tennis Players. *Healthcare* (Vol. 10, Issue 11, p. 2237). MDPI AG. https://doi.org/10.3390/healthcare10112237.

Inside FIFA. (2024). https://inside.fifa.com/womens-football/fifa-female-health-project-snapshot.

Jowett, S., Wachsmuth, S., Boardley, I. D. & Balduck, A. L. (2024). The role of emotional intelligence and quality relationships in athletes' and coaches' levels of satisfaction: a multi-study analysis. *Sports Coaching Review* (pp. 1–24). Informa UK Limited. https://doi.org/10.1080/21640629.2024.2359774.

Kristjánsdóttir, H., Jóhannsdóttir, K. R., Pic, M. & Saavedra, J. M. (2019). Psychological characteristics in women football players: Skills, mental toughness, and anxiety. *Scandinavian Journal of Psychology* (Vol. 60, Issue 6, pp. 609–615). Wiley. https://doi.org/10.1111/sjop.12571.

Li, S., Tang, C., Guo, C. & Bu, T. (2023). Psychometric properties of the Sport Anxiety Scale-2 for Chinese adolescent athletes taking the National Sports College Entrance Examination. *Frontiers in Pediatrics* (Vol. 11). Frontiers Media SA. https://doi.org/10.3389/fped.2023.1161842.

Liang, D., Chen, S., Zhang, W., Xu, K., Li, Y., Li, D., Cheng, H., Xiao, J., Wan, L. & Liu, C. (2021). Investigation of a Progressive Relaxation Training Intervention on Precompetition Anxiety and Sports Performance Among Collegiate Student Athletes. *Frontiers in Psychology* (Vol. 11). Frontiers Media SA. https://doi.org/10.3389/fpsyg.2020.617541.

Martens, R., Vealey, R. S. & Burton, D. (1990a, b). *Competitive anxiety in sport*. (pp. 23-177). Human Kinetics.

Popovych, I., Plokhikh, V., Hrys, A., Pavliuk, M., Nosov, P. & Zinchenko, S. (2023). Operationalization of footballers' emotional intelligence in the dimensions of motivational orientation: analysis based on the basic positions. *Journal of Physical Education and Sport*, 23(3), 772-781. DOI:10.7752/jpes.2023.03095.

Soflu, H. G., Esfahani, N. & Assadi, H. (2011). The Comparison of Emotional Intelligence and Psychological Skills and Their Relationship with Experience among Individual and Team Athletes in Superior League. *Procedia - Social and Behavioral Sciences* (Vol. 30, pp. 2394–2400). Elsevier BV. https://doi.org/10.1016/j.sbspro.2011.10.466.