14 (2) (2025) 354 - 361
Journal of Physical Education, Sport, Health and Recreations
https://journal.unnes.ac.id/journals/peshr

Investigating the Effects of Pre-Competition Anxiety on Sport Psychological Performance in Young Athletes Performance

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Article History

Received January 2025
Accepted May 2025
Published Vol.14 No.(2) 2025

Keywords:
Pre-Competition Anxiety; Sports Performance; Young Athlete.

Abstract

Introduction: success in competition is influenced by various factors including emotion management skills and psychological conditions before competition. pre-competition anxiety is a condition that is widely experienced in adolescent athletes, especially in athletes who are new to competing in elite competitions. this study was conducted to look further at anxiety levels, influencing factors and the effect of pre-competition anxiety on match performance in achieving achievement. Methods: this systematic review protocol adheres to the PRISMA 2020 guidelines. A systematic search was conducted using the popular databases Scopus, ScienceDirect and PubMed published between 2020 and 2025. The search was conducted on peer reviewed articles written in English, and reported on the condition of pre-competition anxiety on competition performance in young athletes aged 12-18 years who competed in professional events. Result: Of the total 975 publications initially identified, 9 studies met the selection criteria for inclusion in this review. These articles explored the effects of pre-competition anxiety on sports performance across various athletic disciplines. The studies provided insights into varying levels of pre-competition anxiety, different interventions aimed at reducing anxiety, and their subsequent effects on performance outcomes. The findings suggest that pre-competition anxiety can significantly impact performance, with both positive and negative effects depending on the anxiety level and intervention methods employed.

How to Cite

Anwari, A. S. N., Isna, N. M., Prasetya, M. R. A., Widodo, A., & Priambodo, A. (2025). Investigating the Effects of Pre-Competition Anxiety on Sport Psychological Performance in Young Athletes Performance. Journal of Physical Education, Sport, Health and Recreation, 14 (2), 354-361.

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p-ISSN 2460-724X
e-ISSN 2252-6773

INTRODUCTION

Physical activity and sports participation among adolescents have numerous positive effects on both in terms of fitness and health (Kumar et al., 2015; Ruiz-Ranz & Asín-Izquierdo, 2024). In addition, achievement in sporting events has also become a prestigious event in various sports (Deng & Fan, 2022). Both internal and external factors significantly influence athletic performance, support from supporters, coach pressure, referees, and the overall condition of the team or individual can create unique pressures for athletes during and after competitions (Galih Dwi Pradipta, 2020). To achieve success in sports, athletes require not only good skills but also contributing factors such as physical fitness, psychological resilience, and a supportive environment, psychologically. Athletes must develop the psychological aspect, an athlete needs skills to manage their emotions and psychological conditions such as anxiety before competing to get maximum results (Robazza et al., 2023).

Anxiety conditions that often occur before a match characterized by somatic symptoms and tension, including excessive sweating, rapid heartbeat, and difficulty breathing (Annisa & Ifdil, 2016). This definition indicates that anxiety is an emotional state that causes discomfort and a feeling of helplessness due to unclear threats. Individuals experiencing an anxiety disorder may encounter persistent worry, doubt, unexpected threats, negative thoughts, fear of failure, and diminished confidence and concentration (Parnabas & Mahamood, 2011). Anxiety encompasses both cognitive and somatic components that can manifest as either a trait or a state (S. Zhang et al., 2018). Somatic anxiety refers to a person's physiological responses, which can be beneficial to a certain degree. When it becomes too intense, they can adversely affect performance. In contrast, cognitive anxiety is characterized by negative expectations, self-doubt, concerns about the current situation, and its potential consequences. An athlete's ability to achieve "Peak Performance" is significantly influenced by the relationship between anxiety and sport, especially in performance sports. Despite thorough training preparation and optimal physical condition, the outcomes of well-prepared training can be undermined by psychological issues such as anxiety (Erika Virginia & Fathoni, 2020).

Pre-competition anxiety is one of the important psychological factors in terms of achieving an athlete's performance, in this case anxiety has a profound impact on athletic performance (Ghorbanzadeh & Bayar, 2013). Athletes participating in sports competitions experience different levels of stress. Excessively high levels of anxiety can adversely affect physiological functioning (Basiaga-Pasternak & Biskup, 2020). This phenomenon also extends to an athlete's effectiveness during both training and competition. The prevalence of anxiety disorders among young Canadian athletes has been reported to increase from 6% in 2011 to 12.9% in 2018 (Wiens et al., 2020). Various factors contribute to decreased athlete achievement and performance due to the burden of anxiety. The effects of anxiety on athletes that can occur includes: tension on the appearance of unstable body coordination movements, decreased athlete confidence, increased self-doubt, and fluctuating emotions, all of which can disrupt performance and hinder an athlete's ability to achieve their goals (Rhamadian & 'Aqobah, 2022). The level of anxiety experienced will significantly influence the performance exhibited during competitions (Novianti Fajra Ilsya & Komarudin, 2019).

Previous research has described the physiological effects of pre-competition anxiety in several competitive sports (Paludo et al., 2022; Panza et al., 2020). However, no studies have established a connection between this condition and game performance, nor its relationship to achieving success. Therefore, this study was conducted to further investigate the levels of anxiety, the influencing factors, and the impact of pre-match anxiety on match performance in relation to achieving success.

METHODS

In this systematic review protocol, we will adhere to the PRISMA 2020 guidelines to ensure comprehensive and transparent reporting of our methodology (Page et al., 2021). The review aims to evaluate the impact of pre-competition anxiety on their playing performance and winning in young athletes. We will conduct a systematic search of relevant literature across multiple databases, including Scopus, ScienceDirect, and PubMed, from 2020 to 2025. The search was conducted using keyword combinations of Medical Subject Headings (MESH) terms and commonly used free-text terms, linked by Boolean OR and AND operators. The specific search strategy included the following keywords : "Anxiety" OR "Pre-competition Anxiety" AND "Athletic Performance" OR "Performance Enhancement" AND "Adolescent OR Young" AND "Athletes" used as keywords.

These articles were selected based on being conducted using a PICO (Participants, Interventions, Comparisons, and Outcomes) study (Nishikawa-Pacher, 2022) with the following inclusion criteria: (a) empirical research, (b) articles published in English, (c) published within the last 5 years, (d) free access articles, (e) research involving young athletes competing in professional events with an age range of 12-18 years. While the exclusion criteria for this study are as follows: (a) discussions that do not focus on pre-match anxiety and sports performance, (b) participants who are not include athletes, (c) case study research or case reports, and (d) studies that do not use subjects other than humans.

The details of the research compilation strategy and its different phases are shown in the PRISMA flow diagram (Figure 1). From the electronic database search strategy, 975 publications were found. After removing duplicates and excluding articles that did not meet the criteria, 389 articles remained. These were further refined based on the year of publication, resulting in the identification of 82 articles. Of these 82 articles, 43 provided full text access, and the screening process continued with a review of the titles and abstract. After analyzing in full text, it was found that 19 of them did not meet the inclusion criteria, and 15 others were deemed irrelevant to the research topic. Therefore, 9 articles that met the criteria were selected for further analysis and used in this systematic review (Alkhawaldeh & Altarawneh, 2023; Aouani et al., 2024; Domínguez-González et al., 2024; Kemarat et al., 2022; Li et al., 2024; Liang et al., 2020; Tamminen et al., 2021; Tassi et al., 2023; Wang, 2023).

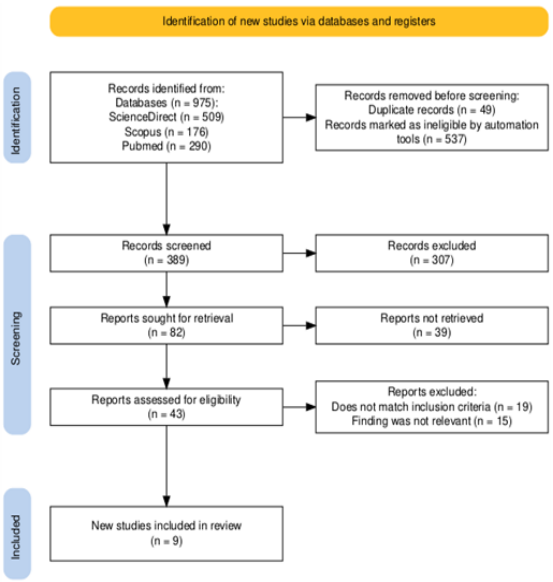

Figure 1. PRISMA flow for study selection.

RESULTS AND DISCUSSION

From the selection of articles included in this review, five were intervention-based, while four employed a mixture of different research approaches. Performance assessments were conducted across various sports, including football, swimming, badminton, table tennis, and several interdependent team sports. Of the nine articles analyzed, we found that five were from Asia (China, Thailand, Jordan), and the other four were from continental Europe (Andalusia), Africa (Tunisia), North America (Canada), and South America (Argentina). **Table 1** provides a summary of these nine studies, including the purpose, study participants, study design, and main findings.

Findings from this systematic review highlight the complex relationship between pre-competition anxiety, psychological traits and athletic performance across a range of sporting contexts. Pre-competition anxiety has consistently emerged as a key factor influencing athletic performance. Previous research has shown that anxiety significantly affects athletes' pre-competition outcomes. Both intrinsic and extrinsic factors contribute to athletes' anxiety levels, with extrinsic factors sometimes playing a greater role (Hardiyono, 2020).

High levels of anxiety are often associated with negative effects on motor skills, confidence and focus, as observed in novice badminton players and athletes with high neuroticism or personality traits that make them experience negative emotions. Neuroticism contributes to higher pre-competition anxiety and increased mind wandering, which diminishes energy levels and hampers performance, as observed in Chinese athletes. This highlights the critical influence of mental states on athletic performance (Li et al., 2024). Similarly, competitive anxiety has been shown to negatively impact confidence and flow state. However, athletes who have experience competing at higher levels tend to show a more favorable psychological profile, suggesting that experience and skill can prevent the adverse effects of anxiety (Domínguez-González et al., 2024). Interestingly, athletes with higher skill levels may experience more anxiety on competition outcomes, while those with lower performance levels tend to focus more on in-game anxiety (L. Zhang, 2023)

Anxiety generally has a detrimental impact on overall sport performance (Khan, 2017). However, other findings also reveal conditions in this relationship. For example, intensive training

Table 1. Summary of Study

Study	Aim	Sport profile	Research Design	Main Finding
(Li et al., 2024)	This study aims to examine the relationship between neuroticism and vigor, as well as the role of anxiety and mind wandering in the relationship between the two, and how they relate to sporting performance	(n = 591, Male:303, Female: 288) Age: 19.32 ± 4.08 y	quantitative correlational study	Instrument: The Pre-Competition Emotion Scale-T Brief Result: The study found that neuroticism negatively affects athletes' vigor, which is crucial for performance. This happens because neuroticism increases pre-competition anxiety and mind wandering, both of which reduce vigor. A serial effect was also observed, where anxiety leads to more mind wandering, further lowering vigor. The findings highlight the need for strategies like relaxation and mindfulness training to help athletes manage anxiety and focus better, improving their energy and performance.
(Domínguez-González et al., 2024)	The study examined whether athletes' emotional self-regulation and the receipt of interpersonal emotion regulation from their teammates were related to their anxiety and goal achievement during competition.	the Division of Honor, National League and First Andalusian League (n = 138) Age: (16.27 ± 1.42 y) the Second Andalusian League, Third Andalusian League and Fourth Andalusian League (n = 190) Age: (15.55 ± 1.38 y)	quantitative, associative, comparative, and predictive	Instrument: Revised Competitive State Anxiety Inventory-2 (CSAI-2R) Result: The findings indicate that the psychological sports profile has a positive association with self-confidence and the flow state. In contrast, competitive anxiety is negatively associated with the psychological sports profile, self-confidence, and the flow state. Additionally, the results show higher scores in the analyzed variables for the older age group and higher competitive level, though no significant differences were found based on playing field positions.
(Aouani et al., 2024)	This study examined the effect of an intensive high-intensity training (HIT) block for 2 weeks on the anxiety state and swimming performance of competitive swimmers, compared to a standard aerobic training program.	Competitive swimmers (n = 22, Male) Age: 16.5 ± 0.29 y	Randomized controlled trial study	Instrument: Revised Competitive State Anxiety Inventory-2 (CSAI-2R) Result: The results showed that the HIT group experienced a significant increase in both cognitive and somatic anxiety compared to the control group, while both groups showed improvements in swimming performance. Although the increased anxiety did not negatively impact performance over this short period
(Wang, 2023)	This study examined group differences in pre-competition anxiety, self-reflection, and resilience based on age, gender, sport level, and exercise duration. It also tested the relationships between pre-competition anxiety, self-reflection, and resilience, and investigated whether self-reflection and resilience can predict pre-competition anxiety	Chinese table tennis player (n = 187, Male: 82, Female: 105) Age:18.6 ± 1.8 y	Cross-sectional study	Instrument: Competitive State Anxiety Inventory-2 (CSAI-2) Result: The study found a significant relationship between pre-competition anxiety, self-reflection, and resilience. It showed that self-reflection and resilience are negatively related to pre-competition anxiety. Factors such as age, sport level, and exercise duration did not significantly affect cognitive and somatic anxiety. However, there were notable differences in the self-confidence of adolescent athletes during national competitions based on gender ($p = 0.006$), age ($p = 0.013$), and sport level ($p = 0.034$). Specifically, males showed greater insight than females, and self-confidence varied across different age groups and sport levels.
(Alkhawaldeh & Altarawneh, 2023)	Determine the effect of trait and state anxiety on the overhead defensive clear shot skill performance of beginner badminton players, focusing on certain kinematic variables.	Beginner badminton players (n = 61) Age: 14.3 ± 1.2 y	Quasi-experimental Study	Instrument: The State-Trait Anxiety Inventory Form Y (STAIF-Y) questionnaire Result: The results showed that both trait and state anxiety had negative effects on the players' performance, with trait anxiety having a more pronounced negative impact.

(Tassi et al., 2023)	This study will examine the effect of an intervention program using stressful constraints on the development of soccer-specific psychological skills (i.e., team resilience and pre-competitive anxiety)	The academy of an elite Argentinean Soccer team (n = 51, Male) Age: =16.54 ± 1.23 y	Quasi-experimental study	Instrument: The Sport Anxiety Scale (SAS-2) Result: The study found that a four-week soccer training program with added stressful challenges helped young elite players develop important psychological skills. The players who trained under these conditions showed less worry and better focus, and their ability to handle pressure (resilience) improved or stayed strong. Importantly, the program did not increase anxiety, and the positive effects lasted even four weeks after the training ended. This shows that using stress in training can mentally prepare players for high-pressure situations, making them more resilient and focused.
(Kemarat et al., 2022)	The purpose of this study was to investigate differences in personality and competitive anxiety based on the type of sport and gender, and to determine the influence of personality on competitive anxiety	Collegiate athletes in the Thailand University Games, 2020. (n = 237, Male: 134, Female: 103) Age: 18–25 years)	quantitative correlational method	Instrument: The Sport Anxiety Scale (SAS-2) Result:The study found that individual athletes had higher levels of competitive anxiety compared to team athletes, but there were no differences in personality traits between the two groups. Women experienced greater competitive anxiety than men, and the personality trait of agreeableness also varied between genders. Among the five personality traits studied, neuroticism showed a significant negative effect on competitive anxiety, serving as a key predictor. Overall, the findings suggest that competitive anxiety and personality traits play an essential role in athletes' performance, highlighting the need for tailored interventions to address mental challenges in sports.
(Tamminen et al., 2021)	The study examined whether athletes' emotional self-regulation and the receipt of interpersonal emotion regulation from their teammates were related to their anxiety and goal achievement during competition.	various interdependent sport teams (volleyball, soccer, ice hockey, basketball, netball, and lacrosse) (n = 509, Male: 229, Female: 280) Age: 19.0 ± 3.1 y	Cross-sectional retrospective survey	Instrument: Sport Emotion Questionnaire Result: The results indicated that competition anxiety was positively predicted by both affect-improving interpersonal emotion regulation (p = .010) and affect-worsening interpersonal emotion regulation (p = .017). The emotional regulation behaviors between teammates play a crucial role in anxiety and performance outcomes, although this effect is reduced when athletes engage in their own emotional self-regulation.
(Liang et al., 2020)	This study investigated the effectiveness of a progressive relaxation training (PRT) intervention in reducing precompetition anxiety and enhancing sports performance among collegiate student athletes.	Collegiate student athlete (n = 25, Male:14, Female: 11) Age: 20.85 ± 1.46 y	Randomized controlled trial study	Instrument: Competitive State Anxiety Inventory-2 (CSAI-2), State-Trait Anxiety Inventory (STAI) Result: The study showed significant between-group differences in the self-confidence dimension of the CSAI-2 at the second and third time points, indicating that rogressive relaxation training had a positive effect on precompetition self-confidence. Additionally, logistic regression analysis revealed that rogressive relaxation training had a positive effect on enhancing sports performance

blocks, despite temporarily increasing anxiety levels, did not impair short-term performance, suggesting that increased anxiety during high-intensity training may play a role in improving psychological and physical preparedness (Aouani et al., 2024). Personality traits play a pivotal role in competitive anxiety. Neuroticism was negatively associated with anxiety, while extroversion, agreeableness, and conscientiousness were positively correlated, demonstrating how individual differences shape anxiety responses (Kemarat et al., 2022). Distinct roles of trait and state anxiety were identified, with trait anxiety exerting a stronger negative influence on skill execution, highlighting the persistent challenges posed by inherent psychological traits (Alkhawaldeh & Altarawneh, 2023). There is a significant relationship between cognitive anxiety and self-confidence, where higher self-confidence is associated with lower levels of cognitive anxiety (Muñoz et al.,

2017). Increased self-confidence and reduced cognitive anxiety have also been shown to positively impact athletic performance outcomes. Conversely, high levels of anxiety can negatively affect sports performance and increase the risk of injury (Adi et al., 2023; Parnabas & Mahamood, 2011).

Various interventions have shown promising results in reducing competitive anxiety (Chang et al., 2020). Moderate levels of anxiety, when managed effectively, have been shown to enhance performance by increasing focus and resilience, as demonstrated in soccer and table tennis players. Intervention strategies, such as stress-induced soccer training, have reduced pre-competition anxiety while fostering psychological resilience, highlighting the effectiveness of targeted programs for addressing anxiety-related performance issues (Tassi et al., 2023). Cognitive-behavioral techniques, such as progressive relaxation, cognitive restructuring, self-talk, guided imagery, yoga, and mindfulness, have proven effective (Chang et al., 2020; Hasanah & Refanthira, 2020). Protective factors like self-reflection and resilience were negatively correlated with anxiety, underscoring their importance in mitigating pre-competition stress (Wang, 2023). Additionally, self- and interpersonal emotion regulation emerged as critical mechanisms for managing competition anxiety and achieving performance goals, emphasizing the importance of emotional intelligence within team dynamics (Tamminen et al., 2021). Progressive relaxation training was particularly effective in reducing anxiety, boosting self-confidence, and enhancing overall sports performance, reinforcing the value of structured psychological interventions (Liang et al., 2020). These findings collectively underscore the multifaceted nature of pre-competition anxiety and emphasize the critical need for comprehensive, targeted approaches to enhance psychological preparedness and optimize athletic performance across various sports and competition levels. Managing pre-competition anxiety is essential for achieving peak performance in athletes.

Implication For Future Research

The findings from these studies highlight the complex relationship between personality, anxiety, and athletic performance. There is a clear need for further exploration of how individual differences, such as personality traits, shape athletes' experiences of and responses to anxiety. Additionally, more research is needed to evaluate the effectiveness of various intervention strategies—such as relaxation training, emotional regulation techniques, and resilience-building exercises—in addressing anxiety across different sports and competitive levels.

Future studies could focus on longitudinal research to better understand the development of anxiety and personality traits over time, particularly in athletes at various stages of their careers. Investigating the long-term effects of anxiety-reducing interventions on performance and psychological well-being would also provide valuable insights. Finally, examining the interplay between individual and team-based factors in sports could shed light on how social dynamics and group cohesion influence anxiety and performance, especially in team sports where interpersonal emotions significantly impact the overall team environment.

CONCLUSION

Pre-competition anxiety plays a key role in performance, with high levels often harming motor skills, confidence, and focus. However, when managed effectively, moderate anxiety can improve resilience and focus, boosting performance. Psychological traits, such as neuroticism, extroversion, and self-confidence, significantly influence how athletes respond to anxiety. While neuroticism increases anxiety and reduces performance, traits like resilience and self-confidence help lower anxiety and improve outcomes. Effective strategies, including relaxation techniques, mindfulness, and stress-based training programs, have been shown to reduce anxiety and enhance psychological readiness. Emotional regulation, both individually and within teams, also plays a crucial role in managing anxiety and improving performance. In summary, managing pre-competition anxiety is essential for optimal athletic performance. Tailored approaches and psychological interventions can help athletes better handle anxiety and achieve success in various sports.

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