

# Innovations

## **A Study on Level of Anxiety among Athletes Before and After Intervention**

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**Abstract :** *This study investigates the effectiveness of a psychological skill training intervention on anxiety levels and self-confidence among short-distance runners, focusing specifically on Ethiopian athletes. Utilizing a pre-test/post-test design within a single group, 18 athletes from the Ethiopian Sport Academy engaged in a 12-week intervention program incorporating imagery, relaxation, and self-talk techniques. Anxiety levels were assessed using the Competitive State Anxiety Inventory-2 (CSAI-2), measuring cognitive anxiety, somatic anxiety, and self-confidence. Results indicated a significant decrease in cognitive anxiety intensity post-intervention, aligning with cognitive-behavioral theory. However, somatic anxiety intensity showed a significant increase, suggesting potential benefits of heightened physiological arousal within an optimal range. Self-confidence levels exhibited a notable improvement post-intervention, in line with Bandura's self-efficacy theory. These findings underscore the transformative potential of psychological training programs in optimizing athletes' mental and physical readiness for competition, highlighting the crucial role of self-confidence in managing anxiety and enhancing performance outcomes. Overall, the study emphasizes the indispensable role of psychological skill training in fostering resilience and empowering athletes to thrive in demanding athletic contexts.*

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### **1. Introduction**

In the field of sports psychology, grasping the magnitude of anxiety among athletes encompasses cognitive anxiety, somatic anxiety, and self-assurance. Cognitive anxiety pertains to the mental facet of anxiety, encompassing concerns, pessimistic thoughts, and fear of failure. Conversely, somatic anxiety involves the physiological signs of anxiety, like heightened heart rate, perspiration, and muscle tension. Self-

confidence, an essential element, mirrors an athlete's confidence in their capacity to excel in a given circumstance. The intensity of these elements profoundly impacts athletic performance. Research conducted by *Hanton et al, (2004)* emphasizes the significance of acknowledging the multifaceted nature of anxiety in athletes. Their study highlights how both cognitive and somatic anxiety can negatively impact performance, with elevated levels of cognitive anxiety often leading to reduced focus and attention, while heightened somatic anxiety can hinder coordination and motor skills. Moreover, self-assurance serves as a shield against anxiety, as increased levels are positively linked with enhanced performance (*Vealey & Chase, 2008*). Addressing anxiety intensity among athletes involves employing tailored psychological techniques. Cognitive-behavioral strategies, such as cognitive restructuring and relaxation training, aid athletes in managing cognitive and somatic anxiety by challenging negative thoughts and fostering physiological relaxation (*Hanton et al., 2004*). Furthermore, interventions aimed at bolstering self-confidence, like visualization and goal setting, empower athletes to have faith in their abilities and perform optimally under pressure (*Vealey & Chase, 2008*).

Athletes experience varying levels of anxiety, impacting their performance significantly. This relationship is pivotal in sports psychology for enhancing athletes' capabilities. Anxiety, divided into cognitive and somatic types, is influenced by factors like personality traits, past experiences, and competitiveness. External factors such as crowd noise can exacerbate anxiety. The Yerkes-Dodson law illustrates how moderate anxiety can enhance focus, but excessive anxiety can hinder performance. Recognizing and managing anxiety effectively are crucial for athletes and coaches to optimize performance and *well-being* *Smith, (2023)* cognitive and somatic elements of anxiety significantly impacts athletes' performance and psychological skills. Cognitive anxiety involves worries and negative thoughts, while somatic anxiety manifests as physical symptoms like increased heart rate and muscle tension. Both dimensions heighten arousal levels, affecting concentration and physical coordination during competitions. High anxiety levels can hinder goal setting, imagery, and self-talk, undermining athletes' confidence and performance. Psychological strategies such as relaxation techniques and cognitive restructuring help manage anxiety, with sports psychologists playing a vital role in providing support. Understanding the interaction between cognitive and somatic dimensions of anxiety empowers athletes and professionals to enhance coping mechanisms and performance in sports environments.

## **2. Psychological Skill Training and Intensity of Anxiety**

Psychological skill training (PST) plays a vital role in reducing anxiety among athletes, thereby enhancing their performance and overall well-being. PST equips

athletes with a range of psychological tools and strategies to effectively manage anxiety levels before, during, and after competition. By addressing cognitive and somatic aspects of anxiety, PST helps athletes develop resilience, confidence, and focus, ultimately leading to improved performance outcomes. An essential method by which PST alleviates anxiety is through cognitive restructuring techniques. Athletes are taught to recognize and confront negative thoughts and unfounded beliefs that fuel anxiety. By substituting these with more rational and positive thoughts, athletes can diminish anxiety levels and foster a mindset that supports peak performance (*Gould et al., 1993*).

Additionally, relaxation techniques in PST, like progressive muscle relaxation and deep breathing exercises, aid athletes in lowering physiological arousal linked to anxiety. Through consistent practice, athletes can effectively control somatic symptoms of anxiety, such as heightened heart rate and muscle tension, resulting in a more relaxed and composed state during competition (*Spielberger et al., 1983*). Moreover, goal setting and imagery, integral aspects of PST, aid athletes in alleviating anxiety by fostering feelings of control and confidence. Establishing specific, measurable, and attainable goals gives athletes clear targets to concentrate on, lessening uncertainty and anxiety regarding performance results. Likewise, mental imagery methods enable athletes to mentally practice successful performances, boosting confidence and decreasing anxiety by acquainting them with competitive scenarios (*Hatzigeorgiadis et al., 2011*).

Research indicates that PST is effective in decreasing anxiety and enhancing performance results in athletes. Studies demonstrate that athletes who participate in PST interventions experience notable decreases in anxiety levels and improved psychological health compared to those who do not undergo such training (*Hanton et al., 2004*).

### **3. Psychological Skill Training and Short Distance Runner**

Psychological skill training (PST) holds significant value for short-distance runners, exerting a notable influence on their performance and competitive outcomes. Given the demands of short-distance races, such as sprints and middle-distance events, which necessitate quick bursts of speed, impeccable technique, and mental resilience, PST provides a tailored toolkit to address the specific needs of these athletes. Central to PST is goal setting, wherein short-distance runners establish clear and achievable objectives, such as refining their starting technique or attaining a specific race time, fostering motivation and concentration throughout training and competition (*Zimmerman & Kitsantas, 2007*). Additionally, visualization emerges as a potent technique for short-distance runners, enabling them to mentally simulate race scenarios and optimize their performance strategies. By mentally envisioning

flawless starts, maintaining impeccable form throughout the race, and crossing the finish line with vigor and determination, runners bolster their confidence and psychological readiness for race day (*Murphy & White, 1978*). Furthermore, self-talk assumes a pivotal role in the mental preparation of short-distance runners, aiding them in managing pre-race nerves, sustaining focus, and fostering resilience during high-intensity races. Through the cultivation of positive and empowering internal dialogue, runners can bolster their confidence, regulate their emotions, and sustain their effort throughout the race, thereby enhancing overall performance outcomes (*Van Raalte et al., 1995*). A study by *Murphy and White (1978)* examined the effects of imagery intervention on self-efficacy in novice runners. Participants engaged in a visualization program, mentally rehearsing running scenarios like starting, pacing, and finishing races. The study found significant improvements in self-efficacy among participants who underwent the imagery intervention compared to those who did not. These findings suggest that visualization techniques can boost runners' confidence and readiness for performance, especially in short-distance races.

#### **4. Intensity of Anxiety and Short-Distance Runners**

Short-distance runners face a range of anxiety levels, which deeply influence their performance. This anxiety encompasses both cognitive and somatic aspects, impacting their mental and physical readiness for competition. Cognitive anxiety involves worries, negative thoughts, and fear of failure, hindering clear thinking and focus, especially crucial in short-distance races where split-second decisions are vital for success (*Hardy et al., 2010*). Conversely, somatic anxiety manifests as physiological responses like increased heart rate, sweating, and tense muscles, which can disrupt coordination and motor skills required for explosive bursts of speed in sprints and middle-distance events (*Hardy et al., 2010*). Furthermore, the Yerkes-Dodson law suggests that while moderate anxiety can enhance performance, excessive anxiety may lead to a decline in standards (*Yerkes & Dodson, 1908*). Hence, managing anxiety intensity is critical for short-distance runners, as it determines the fine line between victory and defeat on the challenging track. Delving into the maze of cognitive challenges brought on by anxiety, short-distance runners grapple with a myriad of psychological obstacles. Internal dialogues of self-doubt, lingering apprehensions, and haunting memories of past setbacks converge to create a formidable barrier to success. In this mental battleground, the importance of psychological interventions becomes paramount. Through techniques like cognitive restructuring, runners uncover their inner strength, challenging negative self-assessments and reshaping their mindset with optimism and confidence (*Hardy et al., 2010*). Meanwhile, amidst the turmoil of heightened physiological arousal, relaxation methods such as deep breathing and progressive muscle relaxation emerge as valuable tools. These techniques equip

runners with the resilience to navigate through somatic challenges and regain composure in the face of adversity (Hardy et al., 2010). In traversing this intricate labyrinth, short-distance runners navigate the intricate interplay between cognitive and somatic realms, harnessing anxiety's turbulent energy in pursuit of athletic excellence.

Individual differences play a significant role in how anxiety interacts with distance running, emphasizing the need to acknowledge that anxiety affects distance runners in diverse ways and to varying extents (*Nieuwenhuys&Oudejans, 2017*). However, several factors contribute to feelings of anxiety among distance runners. Performance-related anxiety, particularly in competitive settings, can be a significant source of stress for runners striving to achieve personal goals, break records, or excel in races (*Mellalieu, Hanton& Fletcher, 2006*). The demanding physical training routines of distance running may also induce anxiety, as athletes may fear injury or burnout from excessive exertion. Furthermore, the intense training regimen can lead to emotional and physical exhaustion, negatively impacting overall well-being. Pre-race anxiety is common among distance runners, driven by the competitive nature of racing. While some athletes find competition exhilarating, others may find it daunting, especially when facing pressure to outperform others or the fear of not performing at their best. Additionally, concerns about body image and appearance can contribute to anxiety, particularly in competitive environments where there is a focus on achieving a specific physique (*Hanton, Mellalieu, & Hall, 2004*).

Running inherently carries the risk of injury, and anxiety stemming from the fear of injury or chronic discomfort can adversely affect an athlete's perspective and overall well-being (*Koehn & Morris, 2012*). Social comparisons with other runners may lead to feelings of inadequacy or worry if an athlete perceives themselves as falling short in comparison to others. Frustration and concern may arise when runners encounter difficulties in improving performance or reach a training plateau, requiring adjustments to training routines or approaches (*Corbin, Barnett, & Matthews, 1979; Nieuwenhuys&Oudejans, 2017*). Prioritizing mental health and well-being is essential for runners. Strategies such as setting realistic goals, maintaining a balanced training regimen, seeking guidance from coaches or mental health professionals, and fostering a positive mindset can help alleviate anxiety among distance runners (*Zhang Woodman, & Roberts, 2018*). It is crucial to tailor anxiety management approaches to the individual needs of each runner, recognizing that what works for one person may not be effective for another.

Anxiety plays a crucial role in shaping the performance of runners during competitive events, a fact underscored by various studies (*Neil & Woodman, 2017; Mellalieu, Hanton& Fletcher, 2006*). The compressed timeframe of competition, where

each passing moment carries weight, heightens the anxiety experienced by short-distance runners. This study aims to investigate the efficacy of an intervention in reducing anxiety levels among athletes by addressing two key research questions. Firstly, it seeks to answer the question: What is the effectiveness of the intervention in reducing anxiety levels among athletes? And secondly: What is the difference in anxiety levels among athletes before and after the intervention, and is this difference statistically significant? With the research hypothesis posits that there is indeed a substantial difference in anxiety levels among athletes before and after the intervention, suggesting that the intervention effectively mitigates anxiety in this population.

## 5. Methodology

In the absence of a control group, the study adopted a pre-test/post-test design within a single group to evaluate the effectiveness of an intervention aimed at managing anxiety among athletes. Anxiety levels were assessed before and after the intervention within the same group to gauge changes over time. The intervention involved 18 short-distance runners from the Ethiopian Sport Academy, consisting of 8 females and 10 males aged between 19 and 25. The assessment utilized the Competitive State Anxiety Inventory-2 (CSAI-2), comprising three subscales: cognitive state anxiety, somatic state anxiety, and self-confidence. The intervention program, inspired by educational methods outlined by *Vealey (1988)*, incorporated various psychological skill training techniques such as imagery, relaxation, and self-talks. Participants engaged in sessions multiple times per week over 12 weeks. Means, standard deviations, and a paired samples t-test were employed to analyze anxiety intensity changes post-intervention, with a significance level set at  $p < 0.05$  (adapted from *Zientek et al., 2016; Bradley et al., 2020*).

## 6. The Intervention Program

The intervention program, drawing from educational approaches by (*Vealey 1988*), utilized a variety of psychological skill training methods. This multimodal program included imagery, relaxation, and self-talk techniques. During self-talk sessions, athletes practiced replacing negative thoughts with rational and positive ones. Relaxation training involved progressive muscle relaxation techniques. In imagery training, athletes mentally simulated race scenarios to enhance performance strategies, envisioning flawless starts, maintaining form, and crossing the finish line. Participants were provided with tools like daily logs and audio CDs containing relaxation and imagery scripts. They also received self-talk sheets to record positive words and thoughts, replacing negative ones. The program spanned 12 weeks, with athletes attending 3 to 5 sessions per week lasting 15 to 30 minutes each (*Bradley et al., 2020*).

**7. Result**

**Table 1 the description the t-test result on intensity of anxiety before and after intervention, cognitive anxiety, somatic anxiety and self-confidence intensity.**

CSA L- 2 Sub scales	Before interventions (n=18)		After intervention (n=18		95% CI of the difference				
	M	SD	M	SD	T	Df	Sig(2 tailed)	Lower	upper
CA	2.796	.4748	2.086	.5503	3.971	17	.001	-.3326	1.0870
SA	2.314	.6334	2.796	.3909	2.255	17	.038	-.9319	.0310
SC	2.067	.3824	3.277	.2965	16.593	17	.000	-.8644	-8.14

CA= Cognitive anxiety, SA= Somatic anxiety. SC= Self-confidence

**8. Dissection**

The findings demonstrated noticeable changes in anxiety intensity following the intervention. Initially, cognitive anxiety levels were higher, with a mean of 2.796 and a standard deviation of 0.4748, compared to post-intervention levels, which decreased to a mean of 2.086 with a standard deviation of 0.5503. This decrease in cognitive anxiety was statistically significant ( $t(17) = 3.971, p = 0.001, 95\% \text{ CI } [-0.3326, 1.0870]$ ). Therefore, the results indicate a significant reduction in cognitive anxiety intensity was observed after intervention.

In contrast, somatic anxiety levels displayed a different pattern, rising from a pre-intervention mean of 2.314 (SD = 0.6334) to a post-intervention mean of 2.796 (SD = 2.255). The paired samples t-test revealed a significant increase in somatic anxiety intensity post-intervention ( $t(17) = 2.255, p = 0.038, 95\% \text{ CI } [-0.9319, -0.0310]$ ). Thus, the findings suggest that following the interventions, there was a significant elevation in somatic anxiety intensity.

Likewise, there was a noticeable improvement in self-confidence levels following the intervention. Initially, the mean self-confidence level was 2.067 (SD = 0.3824) before the intervention, which significantly increased to a post-intervention mean of 3.277 (SD = 0.2965). The paired samples t-test revealed a highly significant rise in self-confidence intensity after the intervention, with a t-value of ( $t(17) = 16.593, p = 0.000, 95\% \text{ CI } [-0.8644, -8.14]$ ). Consequently, it was suggested that self-confidence intensity significantly increased after the interventions. Refer table 1.

## 9. Conclusion

The study demonstrates the significant impact of psychological skill training in decreasing cognitive anxiety intensity among short-distance runners. These findings align with cognitive-behavioral theory, which highlights the influence of cognitive processes on emotional states and behavior (Bandura, 1986). Previous research by Smith et al. (2018) further support the efficacy of psychological interventions in improving athletes' psychological well-being and performance.

The rise in somatic anxiety intensity could indicate heightened physiological arousal, potentially beneficial for performance within an optimal range (Hardy et al., 2017). This suggests that the intervention program may have effectively primed athletes to utilize their physiological arousal for improved performance outcomes. Additionally, the observed increase in somatic anxiety might reflect heightened bodily awareness among athletes, potentially enhancing proprioception and kinesthetic sensitivity crucial for sports performance (Hanin, 2015). While an increase in somatic anxiety initially raises concerns, the study suggests positive implications of the intervention program by reframing somatic anxiety as a resource for performance enhancement, highlighting the transformative potential of psychological training programs in optimizing athletes' mental and physical readiness for competition.

The study highlights the significant impact of psychological skill training on increasing self-confidence among short-distance runners. A notable improvement in self-confidence levels was observed post-intervention, emphasizing the crucial role of psychological interventions in enhancing athletes' mental resilience (Smith et al., 2018). This increase in self-confidence aligns with Bandura's self-efficacy theory, emphasizing the influence of individuals' beliefs on performance outcomes (Bandura, 1997). Moreover, research supports these findings, demonstrating that interventions targeting self-confidence can mitigate anxiety symptoms and enhance overall athletic performance. The effectiveness of the intervention program is further highlighted by the substantial rise in self-assurance, providing athletes with essential psychological resources to navigate high-pressure situations with confidence (Hardy et al., 2017). The study underscores the indispensable role of psychological skill training in fostering self-confidence among athletes, enabling them to effectively manage anxiety and optimize performance outcomes.

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