

NEGATIVE THOUGHTS AND SELF-CONFIDENCE AMONG ATHLETES WITH DIFFERENT SPORTS EXPERIENCES: A META-ANALYSIS

PENSAMENTOS E AUTOCONFIANÇA ENTRE ATLETAS DE DIFERENTES EXPERIÊNCIAS DESPORTIVAS: UMA META-ANÁLISE

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ABSTRACT

An athlete's sporting experience is a factor associated with better-coping strategies and emotional regulation, especially concerning competitive anxiety and its symptoms. To verify whether more experienced athletes have lower rates of negativism and higher levels of self-confidence, we compared the means of these two variables between athletes with more and less experience. A meta-analysis was performed, following the PRISMA model. Seven articles were selected that measured, through the Competitive State Anxiety Inventory – 2 (CSAI-2 or its shortened version, CSAI-2R), the levels of self-confidence and negativism of high-performance athletes with different sports experiences. Significant statistical differences were found regarding the levels of negativism between athletes with more and less experience ($p < .001$). The same occurred with the levels of self-confidence between athletes with more and less sports experience ($< .001$). The results align with our initial hypothesis, formulated by Martens et al. (1990), that athletes with more experience would have higher self-confidence and lower negativism averages. One of the reasons may be using more effective coping strategies that are improved during the career years.

Keywords: anxiety, sports anxiety, competitive anxiety, pre-competitive anxiety, negativity

RESUMO

A alta experiência desportiva de um atleta é um fator que está associado a melhores estratégias de *coping* e regulação emocional, principalmente em relação a ansiedade competitiva e os seus sintomas. Com o intuito de verificar se atletas mais experientes possuem menores índices de negativismo e maiores índices de autoconfiança, comparamos as médias dessas duas variáveis entre atletas com maior e menor experiência. Foi realizada uma meta-análise, seguindo o modelo PRISMA. Foram selecionados 7 artigos que medissem, através do *Competitive State Anxiety Inventory – 2* (CSAI-2 ou sua versão reduzida, CSAI-2R), os níveis de autoconfiança e negativismo de atletas de alta performance com diferentes experiências desportivas. Em relação aos níveis de negativismo entre atletas com maior e menor experiência, foram encontradas diferenças estatisticamente significativas ($p < .001$). O mesmo ocorreu com os níveis de autoconfiança entre atletas com maior e menor experiência desportiva ($< .001$). Os resultados obtidos vão de encontro com nossa hipótese inicial, formulada por Martens et al. (1990), no sentido de que atletas com maior experiência teriam maiores médias de autoconfiança e menores de negativismo. Um dos motivos pode ser o uso de estratégias mais eficazes de *coping* que são aprimoradas durante os anos de carreira.

Palavras-chave: ansiedade no desporto, ansiedade competitiva, ansiedade pré-competição, negativismo

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Throughout history, the concept of anxiety has undergone significant evolution, shaped by cultural, philosophical, and medical perspectives. Its understanding has evolved from ancient times to modernity, reflecting changing beliefs and knowledge.

In ancient civilizations such as Egypt, Greece, and Rome, anxiety was often associated with spiritual or supernatural causes. It was viewed as a disturbance of the soul or an imbalance of the “humors”. During the Middle Ages, anxiety was often attributed to demonic possession or witchcraft, and treatments involved exorcisms and religious rituals aimed at purifying the soul.

With the emergence of the Enlightenment in the 17th and 18th centuries, anxiety began to be seen as a psychological phenomenon. Philosophers like Descartes and Locke explored the relationship between the mind and body, laying the groundwork for a more rational understanding of mental processes.

The field of psychology emerged in the late 19th and early 20th centuries, bringing new perspectives on anxiety. Freud’s psychoanalytic theory highlighted the role of unconscious conflicts and repressed desires in generating anxiety. This marked a shift towards exploring the inner workings of the mind and the influence of early experiences on psychological well-being.

With Skinner, behaviorism gained prominence in the early 20th century, emphasizing observable behaviors and learning processes. Anxiety was seen as a conditioned response to certain stimuli, and behavioral therapies focused on modifying these learned responses through techniques such as desensitization and exposure therapy.

With the work of Beck, the mid-20th century saw the rise of cognitive psychology, which focused on the role of thoughts and beliefs in shaping emotions and behaviors). Anxiety was viewed because of faulty or distorted thinking patterns. Cognitive-behavioral therapies, such

as cognitive restructuring and mindfulness-based techniques, emerged as effective treatments for anxiety disorders.

In recent times, the study of anxiety has expanded to include biological and neuroscientific perspectives. Advances in neuroscience have provided insights into the neural mechanisms underlying anxiety and the influence of genetics and brain chemistry (Craske & Stein, 2016; Craske et al., 2017). This has led to the development of psychopharmacological interventions that target specific neurotransmitters involved in anxiety regulation.

Today, the concept of anxiety encompasses a wide range of experiences, from transient feelings of worry to debilitating anxiety disorders (Kessler et al., 2005). It is recognized as a complex interplay of psychological, biological, and environmental factors. The field continues to evolve, with ongoing research and advancements in understanding and treating anxiety-related conditions.

In conclusion, the concept of anxiety has evolved from spiritual and supernatural explanations to psychological, cognitive, and neuroscientific understandings. This journey reflects the progress of human knowledge and the multidimensional nature of anxiety as a psychological phenomenon (Barlow, 2000). The integration of various theoretical perspectives and empirical research has contributed to our current understanding of anxiety and its treatment.

APPLYING THE CONCEPT TO SPORTS

Some authors consider competitive anxiety to be one of the most studied emotional states in sports psychology in recent decades (Keisha et al., 2015). According to Balyan et al. (2016), the study of anxiety is one of sports psychology’s most productive research lines concerning athletes’ emotional responses and their consequent influence on sports performance.

Weinberg and Gould (2019) describe anxiety as a negative emotional state associated with feelings of nervousness and worry related to

the activation or arousal of the body. Martens et al. (1990) suggest that competitive anxiety is perceived through feelings of body activation, tension, and apprehension, often familiar and reported by athletes in pre-competition moments. These emotions are commonly considered unpleasant by athletes and are associated with anxiety states that influence athletes' sports performance, irrespective of the sport or gender.

According to Paludo et al. (2017), performance anxiety in sports is a relational process between a system of interdependent psychological variables and processes of a cognitive and motivational nature. Thus, anxiety can have different effects on performance, either enhancing, impairing, or not interfering, depending on the psychological characteristics everyone brings to the situation (Silva et al., 2015). Studies suggest that athletes frequently experience unpleasant (negative) emotional experiences before, during, and after competition.

The concept of anxiety has undergone reformulation, as stated by Vasconcelos-Raposo (2000), as its use often lacks the criteria defined for diagnosing anxiety. In this author's opinion, the increased rigor introduced into sports psychology should not allow adherence to the multitude of applications of the same concept, and at this moment, it may reference the criteria established in the DSM-5 (APA, 2013). For example, applying the criteria of the DSM-5 would place competitive anxiety close to the definition of social phobia. However, for it to be considered an anxiety disorder, symptoms must persist for at least six months. Moreover, the anxiety concept neglects the entire athlete's preparation journey for competition, influencing the organism's responses when the individual faces competition. Merely recalling Pavlov's experiments with dogs helps us understand what the author is taking into consideration. Therefore, in the absence of these criteria, sports anxiety needs reformulation, as Vasconcelos-Raposo (2000) suggests,

since studies in the sports field present the concept in a generalized manner, disregarding previously established criteria.

In this sense, the particularities and emotions experienced by athletes, whether before, during, or after competition, must be considered, thus reflecting on how the concept is used in sports. Therefore, the author suggests replacing the term "cognitive anxiety" with another, but for the present study, it will be used as anxiety/negativity and the term "somatic anxiety" with activation (or arousal). The change in terminology has no implications for the dynamics of the Multidimensional theory advanced by Martens et al. (1990). Faced with this issue, we will adopt Vasconcelos-Raposo's (2000) proposal regarding the appropriateness of the anxiety concept, aiming to facilitate the explanation of how anxiety can impact athletic performance.

SPORTS EXPERIENCE AND LEVELS OF SELF-CONFIDENCE AND ANXIETY

The concept of sports experience is linked to the familiarity that athletes gain in competitive environments, constructed and shaped throughout their sporting careers (Weinberg & Gould, 2019). In a study conducted with world-class athletes, it was found that the acquisition of mental skills and the formulation of strategies and interpretations of the competitive scenario are continuous and gradual processes that are part of the sporting career and are related to the learning of new experiences and educational methods (Cerin et al., 2000). The competitive experience of an elite athlete can be a more influential variable than the athlete's competence itself. Indeed, investigations into the relationships between sports experience and competitive anxiety demonstrate that athletes with more sports experience exhibit lower levels of anxiety and higher levels of self-confidence compared to less experienced athletes (Santos et al., 2020).

Research on the relationships between

sports experience and competitive anxiety yields controversial results because it is often presumed that more competent athletes have greater competitive experience. However, athletes can be highly competent with little competition experience. Additionally, analyzing the absolute age of participants rather than years of sports experience may introduce some bias (Santos et al., 2019), as the athlete's absolute age does not always reflect more sports experience. Although some studies examining the relationship between anxiety/negativity and performance may be inconclusive, there is a prevailing trend of increased self-confidence and lower levels of anxiety/negativity, which are sometimes associated with satisfactory sports performance (Paludo et al., 2016).

According to Martens et al. (1990), the greater the athlete's experience, the lower the levels of anxiety/negativity should be and the higher the levels of self-confidence. Elite and non-elite athletes do not differ significantly in response intensity to a competitive situation. However, elite athletes exhibit more effective interpretations of symptoms and thoughts and a higher perception of self-confidence. According to Ribeiro et al. (2014), athletes who interpreted competitive events as highly complex scenarios showed higher levels of anxiety/negativity.

Studies by Martens et al. (1990) indicated that the intensity of negative thoughts decreased from high school athletes to college athletes but increased in those competing at the highest performance level. Confidence levels were higher in elite athletes than in those competing at the high school level. Drawing on years of sports experience as a criterion for elite athletes, researchers observed that in different sports (i.e. golf and rugby), more experienced athletes generally reported significantly higher levels of confidence than less experienced athletes. One possible explanation for this is that more experienced athletes

exhibit less intense symptoms of competitive anxiety, as well as interpretations of symptoms and competitive contexts as facilitators, which may reflect in the absence of negative thoughts (lower anxiety/negativity and higher self-confidence). Mellalieu et al. (2004) also suggest that athletes with more sports experience have more efficient coping strategies than those with less experience.

Concerning the athlete's experience, those with a higher level of performance tend to interpret symptoms of anxiety/negativity as performance facilitators (Vasconcelos-Raposo et al., 2007). As evident in the literature, the greater the athlete's experience, the better the interpretation of anxiety signals and self-confidence, as well as the environment, serving as facilitators for their performance, while less experienced athletes interpret these signals as debilitating to their performance (Fernandes, et al., 2014).

In a recent study by Freire et al. (2020), comparisons were made regarding levels of negative thinking in Jiu-Jitsu athletes, focusing on athletes' age and competitive outcomes. It was observed that younger athletes exhibited higher levels of anxiety/negativity than older athletes, aligning with the hypotheses suggested by Martens et al. (1990). Studies have shown that negative thinking occurrences are influenced by gender, sport type, level of competence, and competitive experience (Fernandes, et al., 2014).

Regarding the athlete's competitive level, studies have also demonstrated that athletes with better results had lower levels of competitive anxiety. This supports the findings of Paludo et al. (2017), which showed that lower levels of anxiety/negativity tend to be associated with more satisfactory outcomes in sports.

The premise is that athletes with highly competitive experience will exhibit lower anxiety/negativity and higher levels of self-confidence than athletes with less experience. The level of this competitive experience seemingly influences the interpretation of

symptoms experienced by athletes in competitive situations, turning competitive experience into a variable of fundamental relevance in studying multidimensional anxiety.

MULTIDIMENSIONAL THEORY OF COMPETITIVE ANXIETY

The multidimensional theory of anxiety is a widely applied framework in sports psychology (Martens et al., 1990). This theory posits that anxiety is a complex phenomenon with various dimensions. These dimensions encompass cognitive anxiety, somatic anxiety, and self-confidence.

Cognitive anxiety pertains to the mental aspect of anxiety, involving worry, negative thoughts, and fear of failure (Cox, 2012). It revolves around an individual's perception of the situation and coping ability. Somatic anxiety, in contrast, relates to the physiological or bodily responses to anxiety, such as increased heart rate, muscle tension, and sweating.

Self-confidence is critical in how individuals respond to anxiety. It encompasses their belief in their abilities and the conviction that they can successfully perform a task. High levels of self-confidence can aid athletes in managing anxiety and performing at their best.

In the realm of sports, the multidimensional theory of anxiety is commonly employed to comprehend and address performance-related anxiety. By identifying and addressing the various dimensions of anxiety, coaches and sports psychologists can assist athletes in developing coping strategies and enhancing performance.

For example, cognitive restructuring techniques can be utilized to help athletes challenge and replace negative thoughts with positive and adaptive ones (Gould et al., 2002). Relaxation techniques, such as deep breathing and progressive muscle relaxation, can alleviate somatic anxiety symptoms (1999). Lastly, fostering self-confidence through goal setting, positive self-talk, and visualization can aid

athletes in managing anxiety and optimizing performance (Weinberg & Gould, 2019).

Overall, the multidimensional theory of anxiety offers a comprehensive framework for understanding and addressing anxiety in sports. By considering the different dimensions of anxiety, athletes, and coaches can develop effective strategies to optimize performance and enhance well-being.

To measure these emotional states, Martens et al. (1990) developed the Multidimensional Theory of Competitive Anxiety (MTCA), which consists of three sub-dimensions: cognitive anxiety, somatic anxiety, and self-confidence. This theory aims to understand the impact of anxiety on sports performance. However, for scientific and theoretical coherence, the authors, in adopting the Multidimensional Theory of Anxiety (MTA) developed by Martens et al. (1990), prefer to designate the three sub-dimensions as follows: anxiety (occurrence of negative thoughts), physiological arousal (autonomic excitability), and self-confidence.

The MTA assumes that the three sub-dimensions have different relationships with performance in sports. Anxiety has a negative and linear relationship, meaning that the higher it is, the worse the performance will be. Arousal has an inverted U-shaped relationship with performance, benefiting performance up to a specific limit, beyond which it hinders performance. Lastly, self-confidence has a positive and linear relationship with performance. In other words, the higher this variable is, the better the sports performance.

Anxiety is related to the occurrence of negative thoughts and expectations about one's skills and abilities. It is also understood as the emotional impact or the cognitive dimension of arousal (Vasconcelos-Raposo, 2000). One characteristic of athletes who exhibit high levels of anxiety/negativity in a competition is the prevalence of negative thoughts and impressions such as "I will not perform well

in this tournament,” “I am not good enough to win,” “My opponents are much better than me,” among other examples.

Arousal is understood as the physiological component of anxiety, capable of affecting the autonomic nervous system in competitive situations. It can be visualized along a spectrum ranging from deep sleep to extreme excitement (Weinberg & Gould, 2019). Arousal can cause the famous “butterflies in the stomach,” increased heart rate, muscle tension, and sweating in athletes, and can be quantified through electro-physiological, respiratory, cardiovascular, and biochemical measures (Vasconcelos-Raposo, 2000).

Finally, self-confidence is represented as a cognitive component, marked by positive feelings and expectations regarding performance and the absence of negative thoughts, precisely the opposite of anxiety/negativity. For this reason, these two variables can be interpreted as opposed to a continuum, with a negative linear relationship (Weinberg & Gould, 2017). It is associated with athletes’ ability to control negative emotions more effectively, a significant variable in competitive performance (Fernandes et al., 2014). It is also identified as the athlete’s expectation of their skills and abilities to achieve positive sports results (Vasconcelos-Raposo et al., 2007). Self-confidence promotes positive emotions, contributes to concentration, and consequently helps athletes strategize during a competition, characterized by a high expectation of success (Weinberg & Gould, 2019).

The hypothesis elaborated by Martens et al. (1990) infers that anxiety/negativity and self-confidence are related to environmental factors, athletes’ expectations regarding the competition level, and adequate preparation. Based on previous experiences, athletes about to compete can evaluate their skills and those of their opponents and subsequently use this information to interpret future events. If athletes’ beliefs about their abilities are irra-

tional, it is common for them to experience higher levels of anxiety/negativity and lower levels of self-confidence.

Due to being considered essential factors in an athlete’s performance, anxiety/negativity and self-confidence have received considerable attention from the scientific field in recent decades (Weinberg & Gould, 2017), making it possible to quantify and interpret variables such as anxiety/negativity and self-confidence in athletes. This has been achieved primarily through developing a questionnaire based on the Multidimensional Theory of Competitive Anxiety (CSAI-2), aiming to assess and understand the influence of these states on sports performance (Martens et al., 1990).

THE COMPETITIVE STATE ANXIETY INVENTORY (CSAI-2)

The Competitive State Anxiety Inventory - 2 (CSAI-2) has been widely used in sports research. However, its validation has raised some concerns. Coelho et al. (2007) conducted a confirmatory factor analysis of the Portuguese version of CSAI-2 and found that the instrument’s original structure was unsuitable. They suggested removing the activation subscale to create a more appropriate model.

Similarly, Paludo et al. (2017) argue that the reduced version of CSAI-2 (CSAI-2R), which excludes the activation subscale and its nine items (consisting of 18 items, nine on anxiety/negativity and nine on self-confidence), provides more conclusive results. When examining the validation studies of the questionnaire, there is an 80% preference for using CSAI-2R compared to the original version (Paludo et al., 2017). This model is considered more suitable for measuring competitive anxiety as it can be applied moments before competition and is easier to administer given the available time (Fernandes et al., 2014). Accordingly, this study will only analyze the anxiety/negativity and self-confidence scales, excluding the activation scale.

To quantify levels of anxiety/negativity, we should sum the following items: “I am worried about this competition,” “I have doubts about myself,” “I am concerned that I may not perform as well as I could in this game,” “I am worried about the possibility of losing,” “I am worried about the possibility of failing under competitive pressure,” “I am worried about the possibility of performing poorly,” “I am worried about not achieving my goal,” “I am worried about disappointing others with my performance,” and “I am worried about not being able to concentrate.” To quantify levels of self-confidence, we should sum the following items: “I feel comfortable,” “I feel at ease,” “I feel self-confident,” “I feel secure,” “I am confident that I can meet the challenge,” “I am confident that I will perform well,” “I feel mentally relaxed,” “I am confident because I can mentally imagine achieving my goal,” and “I am confident that I can overcome obstacles under competitive pressure.” These statements should be answered by circling the number that best reflects the individual’s imagined feelings in a previous competition, providing a quick response without overthinking, as there are no right or wrong answers. The scale ranges from 1 to 4, where one corresponds to “not at all” and four corresponds to “very much.”

The objective of this meta-analysis was to analyze levels of anxiety/negativity and self-confidence in high-performance athletes and compare them according to their sports experiences. After this brief literature review and the conceptualization of anxiety in sports, we can investigate in the selected articles whether the results align with the hypothesis that athletes with higher levels of competitive experience report lower levels of anxiety/negativity and higher levels of self-confidence (Martens et al., 1990).

METHODS

This meta-analysis was conducted following

the recommendations of the PRISMA model (Galvão et al., 2015), formulating the research question using the PICO model. The literature search was performed using the EndNote software, selecting the Web of Science Core Collection database.

The initial study selection involved a two-step process. First, titles were checked for convergence, and articles that measured three aspects were identified: 1) competitive anxiety in sports, 2) anxiety/negativity, and 3) levels of self-confidence. After this initial title review, the selected articles’ abstracts were read to determine if they met the predefined inclusion criteria. Specifically, the study objectives mentioned in the abstracts were examined to see if they addressed the research questions of interest.

Following the abstract review, the full text of each study passing the initial title and abstract screening were read in full by all research team members. This allowed for a thorough evaluation of the entire manuscript against the inclusion criteria before finalizing the group of studies to include in the review. Predefined inclusion criteria were established based on the PICO model:

Population: n = athletes of both sexes (although it was challenging to find articles including female athletes), athletes ranging from the sub-12 age group to seniors (age was not specified in all articles, with one not mentioning age and others only providing average ages for the respective age groups, such as juniors with an average age of 17 and seniors with an average age of 22. Among the five articles that provided specific ages, they ranged from 11 to 39 years), athletes from various sports (Futsal, Boxing, Jiu-Jitsu, Basketball, Handball, Table Tennis, Swimming, and Soccer), elite, semi-elite, and non-elite athletes, athletes who have won medals and those who haven’t, and athletes participating in different championships.

The following three aspects were consi-

dered when selecting manuscripts: Intervention: 1- Analyzing levels of anxiety/negativity and self-confidence in more experienced and less experienced athletes.; 2- Comparison: Comparing levels of anxiety/negativity and self-confidence between more experienced and less experienced athletes; 3 - Outcome: It is expected that more experienced athletes will have higher levels of self-confidence and lower levels of anxiety/negativity, while less experienced athletes are expected to have lower levels of self-confidence and higher levels of anxiety/negativity.

The keywords used for the literature search were anxiety, sport, CSAI-2, and competitive anxiety. As shown in Figure 1, 294 results were found initially. After removing duplicates and selecting articles for further analysis, 49 articles remained. From these, only seven were selected for the meta-analysis. The inclusion criteria for this selection were articles published between 2016 and 2020, articles written in Portuguese, English, or Spanish, original articles, and articles evaluating data related to the CSAI-2 or CSAI-2R questionnaire (anxiety/negativity and self-confidence). Master's theses, books, book chapters, dissertations, articles with limited access, inconclusive articles, clinical interventions, articles focusing on other variables (e.g., perfectionism), articles not addressing self-confidence and anxiety/negativity in a sports context, articles not using the CSAI-2 or CSAI-2R, meta-analyses, systematic reviews, and/or literature reviews were excluded from the study. The final analysis included seven original studies: two from 2017, two from 2019, and three from 2020, with 707 athletes (392 considered less experienced and the remaining 325 considered more experienced). The criteria used to categorize athletes as more experienced or less experienced were elite versus non-elite athletes, champions vs. non-champions, athletes with more competitions vs. those with fewer competitions, and older

athletes vs. younger athletes. Most selected articles had already made this distinction, facilitating our work.

Two separate Excel databases were created to analyze the data on anxiety/negativity and self-confidence. The same seven articles were included in both databases. For each study, the following information was recorded: the article, authors, total sample size, and sample sizes of the control and experimental groups. For each study, the mean and standard deviation of anxiety/negativity and self-confidence scores were calculated separately for the control and experimental groups.

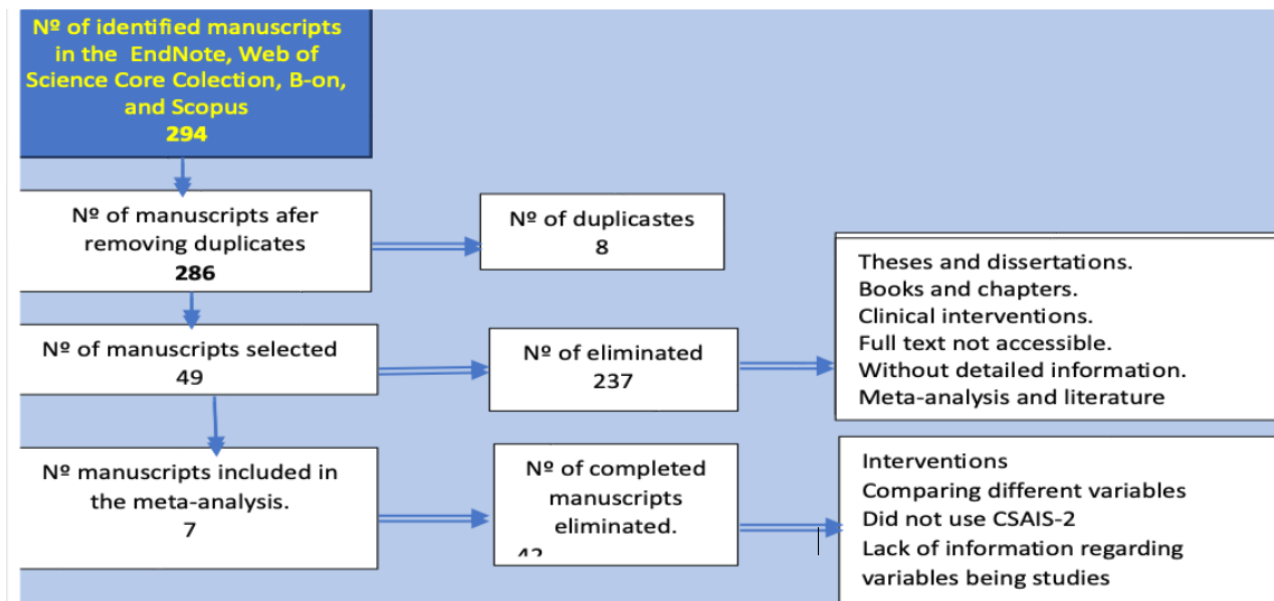
The online effect size calculator on the Psychometrica website (http://psychometrica.de/effect_size.html) was then used to determine the effect size for comparisons between groups with varying sample sizes. Cohen's *d* method was selected through the website interface to calculate the effect size for anxiety/negativity and self-confidence outcomes for each study. This allowed for the evaluation of the impact of the intervention across studies by facilitating the comparison of effect sizes between groups of differing sample sizes. to be compared between studies.

Concerning statistical procedures, *t*-tests were conducted based on the means of anxiety/negativity and self-confidence for each group (less experienced vs. more experienced athletes). The standard error of the difference for each study and the standard error for each group analyzed in the articles were calculated.

With all the collected information, databases for the meta-analysis of anxiety/negativity and self-confidence levels were opened in JASP to run the necessary statistical analyses. The method used was Classical Meta-Analysis. It was possible to conduct the analyses through the program Using information in the databases, such as the effect size of the studies and standard errors.

Through the statistical methods employed, meta-analyses for the differences between

Figure 1: Flowchart Regarding the Inclusion/Exclusion of Articles in The Meta-Analysis.



levels of anxiety/negativity and self-confidence in less experienced and more experienced athletes presented the following.

The analyses for each case are the “Omnibus test of Model Coefficients,” the “Test of Residual Heterogeneity,” the “Wald Test” (for coefficient analysis), and the “Forest-Plot.” Results are presented and analyzed in the third stage of this work (Results). A table with the means of self-confidence and anxiety/negativity for the control and experimental groups of all analyzed articles was provided.

RESULTS

Table 1 presents the seven selected articles analyzed in this meta-analysis. The athlete samples who responded to the competitive anxiety questionnaires were provided, along with the means and standard deviations of anxiety/negativity indices.

Table 2, corresponding to the same seven articles, presented the samples, means, and standard deviations of self-confidence indices. It is observed that out of the seven selected articles, 5 utilized the CSAI-2, and 2 used the reduced version, CSAI-2R, which does not include the activation scale, thus not influen-

cing the results of this study.

Anxiety/Negativity

Table 3 shows the Omnibus test of Model Coefficients numbers, which show the chi-square test results. This hypothesis test examines whether athletes’ sports experience has a significant impact on anxiety/negativity levels. Since the p -value is $< .001$, it is assumed that there are statistically significant differences in the influence of sports experience on athletes’ anxiety/negativity levels. The Test of Residual Heterogeneity, designed to check the model’s heterogeneity, gives us a p -value of .839. It can be concluded that heterogeneity is insignificant, and the model used was suitable for analyzing results.

Regarding the coefficients (estimated standard errors), the 4.720 and $p < .001$ Z-values indicate statistically significant differences. Through this value, we can hypothesize that athletes with more sports experience have lower levels of anxiety/negativity than athletes with less sports experience. Thus, the results align with the initial hypothesis of Martens et al. (1990), assuming that higher-level athletes’ experience corresponds to lower anxiety/

Table 1: Means, Standard Deviation, and Levels of Anxiety/Negativity.

Authors, year	Quest	Sports	Anxiety / Negativity					
			More Experienced			Less Experienced		
			n	M	dp	n	M	dp
Habibi et al., 2017	CSAI-2	Futsal	70	14.74	2.86	130	18.30	3.63
Alejo et al., 2020	CSAI-2	Box	11	12	4.11	38	15.92	5.2
Faro et al., 2020	CSAI-2R	Jiu-Jitsu	24	1.7	.71	32	1.88	.79
Hernandez et al., 2020	CSAI-2R	Handball and Basketball	82	2.93	.64	78	2.61	.73
Hagan Jr et al., 2017	CSAI-2	Table Tennis	26	29.12	4.31	29	26.38	4.22
Branco et al., 2019	CSAI-2	Swimming	52	20.62	6.29	50	19.87	5.17
Serrano et al., 2019	CSAI-2	Football	50	19.42	4.75	35	20.15	5.17

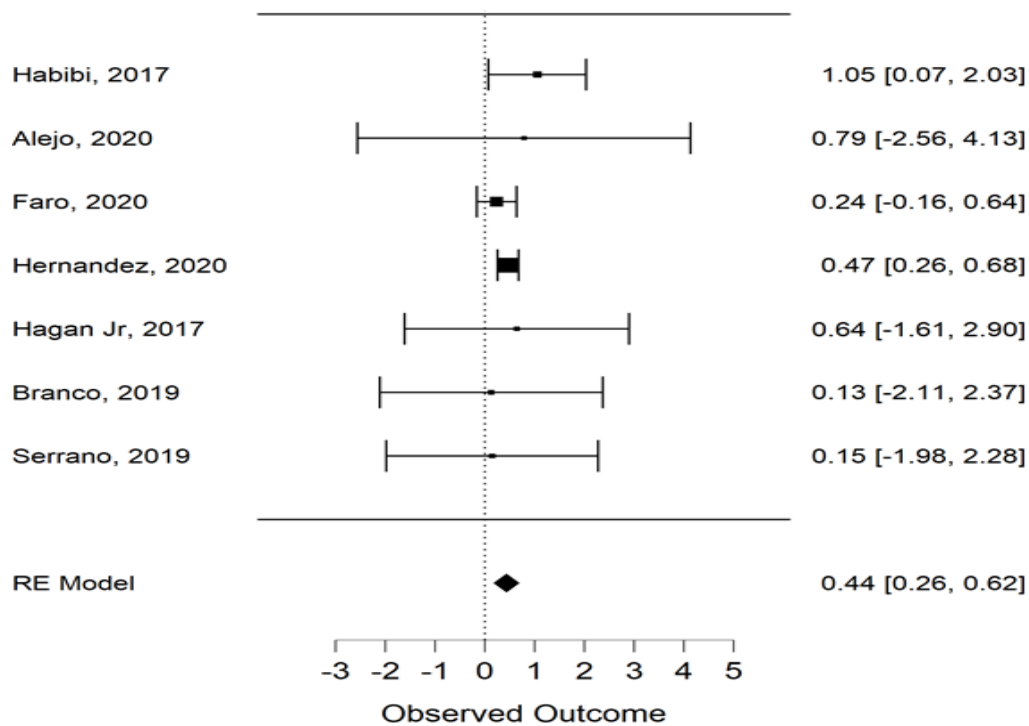
Table 2: Means, and Standard Deviation and Levels of Self-Confidence.

Authors, year	Quest	Sports	Self-confidence					
			More Experienced			Less Experienced		
			n	M	dp	n	M	dp
Habibi et al., 2017	CSAI-2	Futsal	70	17.9	2.4	130	15.33	2.49
Alejo et al., 2020	CSAI-2	Box	11	26.14	4.94	38	29.42	4.82
Faro et al., 2020	CSAI-2R	Jiu-Jitsu	24	2.67	1.05	32	2.85	.81
Hernandez et al., 2020	CSAI-2R	Handball and Basketball	82	3.63	.53	78	3.1	.62
Hagan Jr et al., 2017	CSAI-2	Table Tennis	26	34.58	2.82	29	32.27	5.26
Branco et al., 2019	CSAI-2	Swimming	52	24.33	5.53	50	24.21	4.86
Serrano et al., 2019	CSAI-2	Football	50	30.67	4.24	35	28.96	3.96

negativity levels.

The Forest-plot in Table 3 provides a more comprehensive view of the selected and analyzed articles. In a Forest-Plot, horizontal lines represent individual studies with the result represented in a box (square), and the horizontal line represents the 95% confidence interval of the result. Any study line crossing

the null effect line (vertical line) does not reflect a statistically significant result, implying that the study's results are the null value. This is the case for articles 2, 3, 5, 6, and 7. In articles 1 and 4, as the horizontal line does not cross the null effect line, we can say that these studies presented statistically significant results. The diamond at the bottom of the

Table 3: Forest Plot da Anxiety/Negativity.

Forest-Plot shows the combined results of the individual studies. When analyzed together, we can say that statistically significant differences were found between anxiety/negativity levels in less and more experienced athletes, as the diamond does not cross the vertical line.

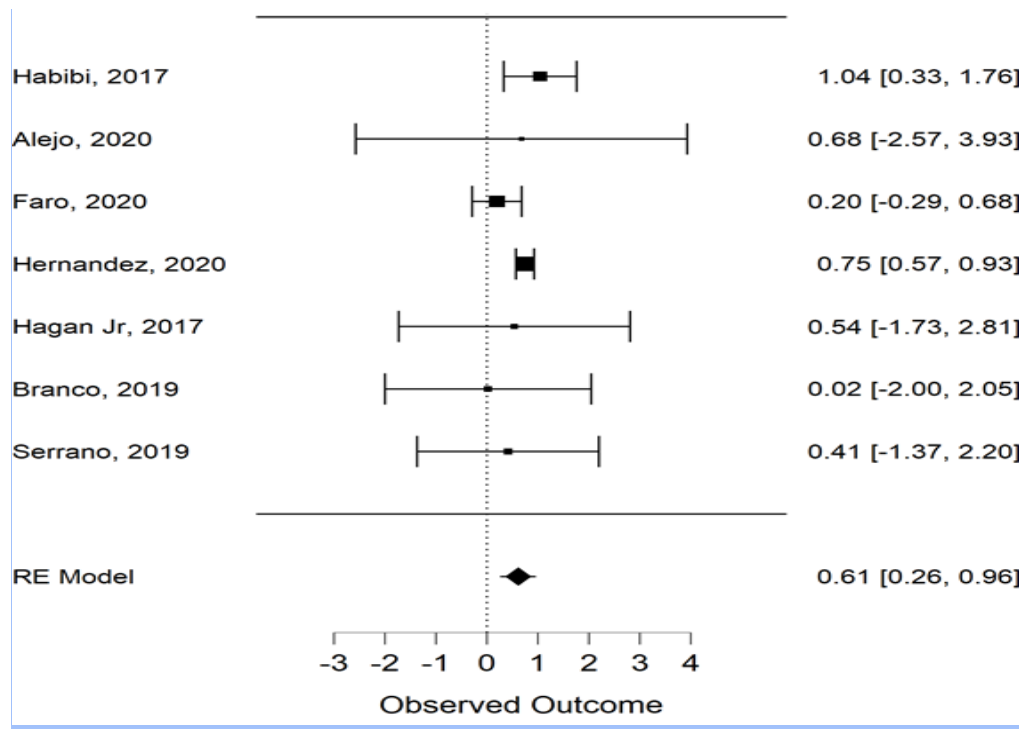
Self-Confidence

The values of the Omnibus test of Model Coefficients ($Q = 11.796$, $df = 1$, $p < .001$) and the Residual Heterogeneity test ($Q = 5.832$, $df = 6$, $p = .0442$) examined whether the athletes' sporting experience had a significant impact on self-confidence levels. As the p -value is $< .001$, it is assumed that there are statistically significant differences in the influence of sporting experience on athletes' self-confidence levels. In turn, the Residual Heterogeneity test, which aims to verify the heterogeneity of the model, presents a p -value = .442. It can be concluded that the heterogeneity is insignificant and that the model used was suitable for analyzing the results. The coefficients obtained through the Wald Test and with a p -value $< .001$ allow

accepting the assumption that athletes with more sporting experience have higher levels of self-confidence than athletes with less sporting experience. In this way, the results also confirm the initial hypothesis of Martens et al. (1990), which indicates that the greater the athletes' experience, the higher the self-confidence indices.

Through the forest plot (Table 4), we can observe that through an individual analysis of the articles, studies 2, 3, 5, 6, and 7 do not present statistically significant results for the self-confidence levels between less and more experienced athletes. Similarly to the analysis of negativity levels, articles 1 and 4 presented statistically significant results. When analyzed together, the diamond at the bottom of the Forest-Plot indicates that statistically significant differences were found in the self-confidence levels between less and more experienced athletes. This is verified because the diamond does not cross the vertical line, the null effect line.

Table 4: Forest Plot for Self-confidence.



DISCUSSION

Once the results of this study were presented, the levels of negativity and self-confidence of high-performance athletes were identified through the Competitive State Anxiety Inventory - 2 (CSAI-2) or its reduced version (CSAI-2R) to verify whether the factor of sporting experience exerts a significant influence on these variables. Thus, the main objective of this meta-analysis was to identify possible differences in the indices of negativity and self-confidence between athletes of different sporting experiences, assuming that those with more experience would supposedly have higher indices of self-confidence and lower negativity than less experienced athletes (Martens et al., 1990). The authors Detanico and Santos (2005), point out in their studies that the levels of competitive anxiety in high-performance athletes are inversely related to the time of practice and competitive experience, stating that the more an individual competes, the less anxiety they have. After interpreting the results, we identified statistically signifi-

cant differences in the levels of self-confidence and negativity between athletes with more and less sporting experience, which reinforces the hypothesis initially placed in this study.

The state of competitive anxiety is possibly influenced by the level of competition of the athletes. According to Hofseth et al. (2017), the athlete’s experience would be the greatest predictor of the prevalence of negativity in athletes, and the greater this experience, the lower the levels of negativity are likely to be. One of the reasons for these differences may be in the cognitive evaluation process or perception of the various demands that sports competitions require from athletes.

The way the athlete will interpret that specific situation is as important as having the physical, technical and tactical ability to perform a certain task. Still on the importance of evaluating the situations presented in a competitive context, high-experience athletes tend to have more facilitating interpretations of the symptoms of anxiety they experience in pre, during and post-competition moments.

Zarauz-Sancho and Ruiz-Juan (2015) identified higher levels of negativity and lower self-confidence in athletes with less sporting experience. About possible explanations, Arbinaga and Caracuel (2005) indicate that more experienced and older competitors tend to cope better with competitive situations, which results in lower levels of negativity and higher self-confidence.

Once the results of this study were presented, the levels of negativity and self-confidence of high-performance athletes were identified through the Competitive State Anxiety Inventory - 2 (CSAI-2) or its reduced version (CSAI-2R), to verify whether the factor of sporting experience exerts a significant influence on these variables. Thus, the main objective of this meta-analysis was to identify possible differences in the indices of negativity and self-confidence between athletes of different sporting experiences, assuming that those with more experience would supposedly have higher indices of self-confidence and lower negativity than less experienced athletes (Martens et al., 1990).

The concept of “anxiety” in sports is certainly a nuanced issue. On one hand, it is natural for athletes to feel some level of nerves or anticipation before competing, as that adrenaline can serve an adaptive purpose in motivating top performance. However, continually labeling those feelings as “anxiety” without considering other diagnostic criteria could promote an unhelpful mindset.

Perhaps a better approach would be to distinguish between short-term pre-game “jitters” and a true anxiety disorder requiring clinical intervention. Theological perspectives could also offer useful framing here - many religious traditions teach that a moderate degree of apprehension can be refocused into positive energy, while excessive worrying is spiritually unhealthy.

Overall, it might not be necessary to eliminate the concept of anxiety in sports.

However, rethinking and eventually changing the terminology may help athletes maintain a gold psychological state. A bit of nervous energy is not inherently bad, as long as it does not cross over into real impairment or prevent game enjoyment.

Given that the CSAI-2 does not serve as a diagnostic tool and to align with a more accessible and straightforward language, referring to the cognitive scale solely as “negative thoughts” or “negativity” is both accurate and advisable. This adjustment in terminology not only simplifies the description but also maintains clarity in conveying the essence of what the cognitive scale of the CSAI-2 aims to capture.

Therefore, when discussing the cognitive anxiety component of the CSAI-2, one may indeed refer to it as an evaluation of an individual’s “negative thoughts” related to the competitive event. This more straightforward terminology encapsulates the essence of the cognitive aspect of anxiety, encompassing self-critical thinking, fear of failure, and other pessimistic thought patterns without delving into the formal terminology associated with clinical diagnoses.

In scientific writing, ensuring clarity and accessibility of language is essential, especially when communicating complex concepts to a diverse audience of students, researchers, and professionals. This terminological adjustment (from anxiety to negativity) maintains accuracy while enhancing the comprehensibility of the content, aligning with the goal of effective scientific communication, as well as the fundamental purposes of the instrument.

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