Relação entre frequência de uso das habilidades psicológicas e ansiedade competitiva em atletas de elite

Relationship between frequency of use of psychological skills and competitive anxiety in elite athletes

Relación entre frecuencia de uso de habilidades psicológicas y ansiedad competitiva en atletas de elite

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Resumo

O presente estudo teve como objetivo verificar o efeito da frequência de uso das habilidades psicológicas (relaxamento, controle emocional, automatização, definição de objetivos, imagética, diálogo interno, pensamentos negativos e ativação), nas ansiedades (somática e cognitiva), e na autoconfiança em atletas de elite competitiva. O estudo foi do tipo transversal, relacional e *ex pos facto*. A amostra foi do tipo não probabilística, intencional e participaram do estudo 64 atletas de elite competitiva com média de idade de 25,70 (DP = 4,53), de diferentes modalidades esportivas. As versões brasileiras do *Competitive State Anxiety Inventory-2* e do *Test of Performance Strategies-2* foram aplicadas na semana que antecedeu as competições. Foram encontrados efeitos significativos da frequência de uso em relaxamento, automatização e imagética na ansiedade cognitiva e na ansiedade somática. Por outro lado, frequência de uso em pensamentos negativos e controle emocional, apresentaram um efeito significativo nas ansiedades (cognitiva e somática) e na autoconfiança. Além disso, a frequência de uso em definição de objetivos e ativação apresentaram um efeito significativo somente para autoconfiança. Esses achados são de suma importância para a Psicologia do Esporte no Brasil, por sugerir que a frequência de uso em habilidades psicológicas pode interferir na ansiedade competitiva.

Palavras-chaves: : Habilidades psicológicas, Ansiedade competitiva, Atletas de elite.

Abstract

The present study aimed to investigate the effect of frequency of use of psychological skills (relaxation, emotional control, automatization, goal setting, imagery, self-talk, negative thoughts, and activation) on somatic and cognitive anxieties, as well as self-confidence in competitive elite athletes. The study employed a cross-sectional, relational, and ex post facto design. The non-probabilistic, intentional sample consisted of 64 competitive elite athletes with a mean age of 25.70 (SD = 4.53), participating in various sports disciplines. The Brazilian versions of the Competitive State Anxiety Inventory-2 and the Test of Performance Strategies-2 were administered in the week preceding the competitions. Significant effects of frequency of use were observed for relaxation, automatization, and imagery on cognitive anxiety and somatic anxiety. Conversely, frequency of use in negative thoughts and emotional control demonstrated significant effects on both cognitive and somatic anxieties, as well as self-confidence. Additionally, the frequency of use in goal setting and activation showed a significant effect solely on self-confidence. These findings are of utmost importance to Sports Psychology in Brazil, suggesting that the frequency of utilizing psychological skills may influence competitive anxiety.
Keywords: Psychological Skills, Competitive Anxiety, Elite Athletes.

Resumen

El presente estudio tuvo como objetivo verificar el efecto de la frecuencia de uso de habilidades psicológicas (relajación, control emocional, automatización, establecimiento de metas, imaginería, diálogo interno, pensamientos negativos y activación) sobre las ansiedades: somática y cognitiva, y la autoconfianza en deportistas. élite competitiva. El estudio fue transversal, relacional y ex post hecho. La muestra fue no probabilística, intencional y participaron en el estudio 64 deportistas de competición de élite con una edad media de 25.70 (DE = 4.53) de diferentes deportes. Las versiones brasileñas del Inventario de Ansiedad Estado Competitivo-2 y del Test de Estrategias de Desempeño-2 fueron aplicadas en la semana previa a las competencias. Se encontraron efectos significativos de la frecuencia de uso en relajación, automatización e imaginación sobre la ansiedad cognitiva y la ansiedad somática. Por otro lado, la frecuencia de uso en pensamientos negativos y control emocional, tuvo un efecto significativo

sobre la ansiedad (cognitiva y somática) y la autoconfianza. Además, la frecuencia de uso en el establecimiento de objetivos y la activación tuvo un efecto significativo solo para la confianza en uno mismo. Estos hallazgos son de suma importancia para la Psicología del Deporte en Brasil, ya que sugieren que la frecuencia de uso de las habilidades psicológicas puede interferir con la ansiedad competitiva.
Palabras clave*: Habilidades psicológicas, Ansiedad competitiva, Deportistas de élite.*

Introduction

Coaches and trainers emphasize that Sports Psychology holds significant importance within the realm of Sports Science (Bakker et al., 1990). Broadly, Sports Psychology undertakes studies that connect psychological aspects with athletic performance (Fernandes et al., 2021). The advancement of knowledge in this scientific field has heightened the credibility and relevance of psychological factors in sports and competition, specifically aiding athletes in enhancing their outcomes during competitions. Similarly, Lochbaum et al. (2022) have recently suggested that techniques involving Psychological Skills (PS) can contribute to improved athletic performance.

For over four decades, the investigation of emotional states and Psychological Skills (PS) in competitions linked to athletic performance has been a focal point within this scientific domain. Since the 1980s, the United States has witnessed a steady surge in interest towards Psychological Skills Training (PST) (Vealey, 1988). In a comprehensive review study published in The Sport Psychologist, Vealey (1994) observed a significant proportion (48%) of studies focused on mental skills training and athletes' mental strategies, encompassing 84 studies out of the 173 studies analyzed.

According to Neil et al. (2006), amateur athletes predominantly employ relaxation strategies to decrease anxiety intensity. In contrast, elite athletes seem to maintain higher levels of intensity and adopt a combination of skills to interpret anxiety symptoms as performance facilitators. Potential mechanisms for this process involve the utilization of imagery and techniques to enhance the efficacy of verbal persuasion in guarding against interpretations of debilitating symptoms. In addition, Munroe-Chandler et al. (2023) suggests that imagery techniques aid in managing competitive anxiety, as well as highlight the significance of these techniques for achieving high-level performance.

Dominikus et al. (2009) investigated the relationship between Psychological Skills (PS) and the interpretation of anxiety direction and self-confidence among 108 high school hockey athletes, comprising 54 males and 54 females. The utilization of PS, such

as goal setting, demonstrated a positive relationship with the direction of cognitive anxiety, somatic anxiety, and self-confidence. The authors suggest that athletes perceive goal setting as crucial for interpreting their cognitive abilities, somatic anxiety, and self-confidence, as these factors can aid in enhancing their performance. Additionally, the study indicates that activation, relaxation, and imagery are PS that have a positive relationship with self-confidence direction, even though they exhibit a negative relationship with the direction of cognitive and somatic anxieties. Thus, the authors conclude that athletes require these PS to interpret self-confidence as a performance-facilitating factor. In a similar vein, Saemi et al. (2011) conducted a study aiming to relate PS and competitive anxiety among 120 college-level female volleyball players. The findings underscore the coaches' role in utilizing athletes' PS to help them interpret anxiety as a facilitator.

In Brazil, this research domain is also in progress, primarily limited to studies involving samples of amateur athletes, such as those conducted by Faro et al. (2020), Fernandes et al. (2019), and Fernandes et al. (2021). Consequently, given the empirical findings concerning the psychological aspects of competitive athletes and recognizing the scarcity of studies of this nature focusing on elite athletes in the country, studies that prioritize the assessment of emotional states, such as psychological skills (PS), and their relationships with competitive anxiety (CA) among this athlete category are essential. Such studies are crucial for enhancing the understanding of sports performance in the Brazilian context.

Building upon the earlier mentioned scientific evidence, the overarching goal of the current study is to investigate the relationships between Psychological Skills (in a competitive context) and Competitive Anxiety (cognitive anxiety, somatic anxiety, and self-confidence) among elite athletes. Competitive anxiety is a multidimensional construct, being constituted by cognitive anxiety, somatic anxiety and self-confidence. Cognitive anxiety refers to negative expectations, on the part of the athlete, not that it concerns their performance and somatic anxiety exposed to the negative physiological aspects of the frequency of use of feeling anxious, such as increased blood pressure, dry mouth, muscle tension, increased heart rate, sweat in my hands and "cold" in my belly. The term self-confidence originates from the Theory of Self-efficacy which refers to the judgment that individuals have about their ability to plan and carry out a specific course of action to achieve a specific performance.

The study hypotheses are as follows: H1: There will be a significant positive correlation between sports experience and self-confidence, and a significant negative correlation between sports experience and cognitive and somatic anxiety; H2: Relaxation will have a significant effect on competitive anxiety; H3: Emotional control will have a significant effect on competitive anxiety; H4: Automatization will have a significant effect on competitive anxiety; H5: Goal setting will have a significant effect on competitive anxiety; H6: Imagery will have a significant effect on competitive anxiety; H7: Negative thoughts will have a significant effect on competitive anxiety; and finally, H8: Activation will have a significant effect on competitive anxiety.

Objective

The specific objectives are as follows: i) To characterize the sample in terms of gender, age, and duration of sports experience; ii) To describe the levels of competitive anxiety and psychological skills among participants; iii) To explore whether there are relationships between sports experience duration and competitive anxiety, as well as gender differences in this variable; and iv) To examine the effect of the frequency of utilization of psychological skills (relaxation, emotional control, automatization, goal setting, imagery, self-talk, negative thoughts, and activation) on somatic and cognitive anxieties, as well as self-confidence, in competitive elite athletes.

Method

The study adopted a cross-sectional, relational, and *ex post facto* design. The sample was non-probabilistic and intentional.

Participants

The population consisted of elite Brazilian athletes. A priori sample calculation was performed using the G Power 3.1.9.7 software, adopting an effect size of .20, alpha value for probalistic error of .05, power (1 – beta err prob) .95 (Fortes, Nascimento Junior, Freire, & Ferreira, 2020). A minimum number of 56 athletes was identified so that the findings could be inferred for the population.

The study included 64 competitive elite athletes (Swann et al., 2015) with an average age of 25.70 (SD = 4.53), comprising 60 male individuals and 4 female

individuals, from various sports disciplines. The distribution across sports disciplines was as follows: n = 16 (handball), n = 2 (swimming), n = 3 (jiu-jitsu), n = 1 (judo wrestler), n = 1 (boxing/mma), n = 1 (trail running), n = 1 (mountain biking), n = 1 (mma/jiu-jitsu), n = 1 (muay thai), n = 1 (combat sports athlete), n = 1 (muay thai/mma), n = 1 (karate), n = 1 (mma), and n = 33 (football). The average duration of practice in the sports discipline was 9.53 years (SD = 4.29), the average duration of competing in the sports discipline was 7.78 years (SD = 4.69), and the average duration of being competitive elite athletes was 6.63 years (SD = 3.61).

All athletes and coaches agreed to participate in the research and provided their signatures on the consent form. The research project was fully approved by the Ethics Research Committee of the Santa Cruz State University (Brazil) with protocol number CAAE: 88692218.3.0000.5526 according to the Declaration of Helsinki.

The inclusion criteria were: (1) being over 18 years of age, and (2) being a professional elite athlete compensated by the institution or sponsorship. Athletes who were not actively participating in competitions for any reason were excluded from the study.

Instruments

The sequence of instrument completion was as follows: 1) Sociodemographic data; 2) Competitive State Anxiety Inventory-2R (CSAI-2R); 3) Test of Performance Strategies-2 (TOPS-2).

The sociodemographic questionnaire consisted of the following inquiries: 1) age; 2) gender; 3) sports discipline; 4) duration of engagement in the sports discipline; 5) duration of competitive experience; 6) duration of being a professional and/or elite athlete.

To measure Competitive Anxiety, the athletes completed the Brazilian version (Fernandes et al., 2012) of the shortened Competitive State Anxiety Inventory-2 (Martens et al., 1990), which included the addition of a response direction dimension alongside the usual intensity dimension. This instrument comprises 16 items measuring three dimensions: cognitive anxiety (items 1, 4, 6, 8, and 12), somatic anxiety (items 2, 5, 9, 11, 13, and 15), and self-confidence (items 3, 7, 10, 14, and 16). The intensity response dimension was assessed on a 4-point Likert scale, ranging from 1 (not at all) to 4 (very much).

The CSAI-2R was translated and validated for Brazilian Portuguese, exhibiting good internal consistency for cognitive anxiety cronbach's alpha (.84), somatic anxiety cronbach's alpha (.78), and self-confidence cronbach's alpha (0.80) (Fernandes et al., 2012). It also demonstrated favorable fit indices (CFI = 0.95, NNFI = 0.94, and RMSEA = .054).

To measure Psychological Skills, the Brazilian version (Fernandes et al., 2013) of the Test of Performance Strategies-2 (Hardy et al., 2010) was utilized, comprising a total of 39 items distributed across two scales assessing psychological skills in training or competition contexts. For this study, only the subscale of psychological skills in competition was employed, consisting of seven factors: goal setting (items: 8, 9, and 14), emotional control (21, 22, and 29), automatization (24, 34, and 38), relaxation (25, 32, and 35), imagery (11, 18, and 20), negative thoughts (4, 6, and 19), and activation (28, 31, and 36). Responses to the statements were provided on a five-point Likert-type scale aiming to measure the intensity of these constructs (1 = never to 5 = always). Scores for each factor were summed and divided by three (number of items per factor), resulting in a factor score ranging from 1 to 5.

According to Fernandes et al. (2013), who employed Confirmatory Factor Analysis procedures to examine the psychometric properties of the Brazilian version of the TOPS-2, the results revealed favorable reliability indices cronbach's alpha ($\alpha > .70$) as well as satisfactory fit indices for training (GFI = .953; CFI = .944; RMSEA = .046) and competition contexts (GFI = .941; CFI = .945; RMSEA = .045).

Procedure

Researchers contacted the coaches to obtain permission and access to the athletes, as well as to schedule data collection dates, times, and locations. Once the permission was obtained, coaches were contacted by the researchers and authorization and access to the athletes were obtained as well. At this moment, times and places of data collection were arranged. After this contact, the athletes were informed of the objectives of the investigation and filled out the Informed Consent Form (ICF), in which anonymity and confidentiality were guaranteed throughout the data collection procedure.

On the days established by the coaches and researchers, the participants completed a sociodemographic questionnaire, as well as the TOPS-2 and CSAI-2R instruments, in the week before a competition. Completing the three questionnaires took an average of

20 minutes and were completed by the athletes themselves before the competition. The risks involved were related to the time of completion, as the athletes, while facing the competition, could have had altered their pre-competitive concentration, which could interfere with their performance. However, the athletes were already aware and with the endorsement of the coach about the times and places for filling it out. In addition, athletes were free to refuse participation at any time and for any reason, without any type of penalty or reprisal. This information was given in the first contact, both verbally and in writing in the ICF. It is important to emphasize that the participation in the study, in addition to the objectives of the present research, also generates a direct benefit to the athlete, since the coach can use the results of the psychological attributes for diagnosis/prognosis in the training and competition environment.

Statistical Analysis

Initially, descriptive statistics were employed to characterize the sample in terms of gender and age, duration of sports experience, levels of competitive anxiety, and levels of psychological skills. Frequency and percentage (for gender) were used to characterize the sample sociodemographically and in terms of sports experience (duration of practice, duration of competition, and duration as an elite athlete). Measures of central tendency, such as Mean, and dispersion (standard deviation) were used for other variables. To describe the sample in terms of anxiety levels, self-confidence, and psychological skills, the procedure that compares the Confidence Interval (CI) of the Mean with the midpoint of the scale was applied. The CI could be situated below, at, or above the midpoint of the scale, enabling the interpretation of whether the levels of these constructs are low, moderate, or high in the sample.

The data analysis was conducted in four stages. Firstly, assumptions of normality [Preliminary descriptive analysis of the data indicated that all univariate normality coefficients of the items were within the range of -1.96 to +1.96. These absolute values of skewness and kurtosis were considered normally distributed (Fernandes et al., 2012; Kline, 2010).], linearity, multicollinearity, and homogeneity of the variance-covariance matrix were assessed using frequency distributions (The p values of the Box's test for goal setting comp was $p = .226$, for emotional control comp was $p = 0$, for automation comp was $p = .048$, for relaxation comp was $p = .006$, for imagery comp was $p = .088$, for negative thoughts comp was $p = 0$, for activation comp was $p = .322$) ou (Box's test values

were: for the psychological skills goal setting comp, automation comp, relaxation comp, imagery comp and activation comp presented p > .001 and for the psychological skills emotional control comp and negative thoughts comp presented p ≤ . 001), scatter plots, and Box's M test. Secondly, the reliability of the dimensions of the Brazilian versions of TOPS-2 and CSAI-2 was verified. Thirdly, Pearson correlation between psychological skills (PS) and competitive anxiety (CA) was examined. In the fourth stage, the split-median post hoc method was applied to dichotomize groups into "low" (below the median) and "high" (above the median) PS experience based on their scores (Fletcher & Hanton, 2001; Fernandes et al., 2014; 2019; 2021). Finally, univariate and multivariate analysis of variance (MANOVA) procedures were employed to ascertain the effect of PS experiences on CA. Additionally, effect sizes will be evaluated with cutoff points of .01, .06, and .14, representing small, medium, and large effect sizes, respectively (Cohen, 1988). These analyses were conducted using SPSS 21.0, maintaining a significance level of 5% (p < .05).

Results

Levels of Competitive Anxiety and Psychological Skills among the participants.

Regarding competitive anxiety, the employed measure yields three scores, as competitive anxiety perception is a three-dimensional construct composed of cognitive anxiety, somatic anxiety, and self-confidence. Each subscale measuring competitive anxiety has four points, with a minimum score of 1 and a maximum score of 4. The midpoint of the scale is therefore 2.5. The mean score for cognitive anxiety in the total sample (n = 64) was 2.42 (± .13). The Confidence Interval ranged from 2.17 to 2.68. Therefore, considering that the midpoint of the scale for each question is 2.5, it is concluded that on average, individuals tended to report moderate levels of cognitive anxiety as the confidence interval includes the midpoint of the scale. The mean score for somatic anxiety was 2.07 (± .14). The Confidence Interval ranged from 1.80 to 2.33. Thus, considering that the midpoint of the scale for each question is 2.5, it is concluded that on average, individuals tended to report low levels of somatic anxiety as the confidence interval was strictly below the midpoint of the scale. Finally, the mean score for self-confidence was 3.65 (± .06). The Confidence Interval ranged from 3.54 to 3.76. Therefore, considering that the midpoint of the scale for each question is 2.5, it is

concluded that on average, individuals tended to report very high levels of self-confidence as the confidence interval was strictly above the midpoint of the scale.

Concerning the use of psychological skills, seven subscales were employed to measure this construct considering the competition situation only. The scales had five points, ranging from 1 (never) to 5 (always). The midpoint of the scale is 3.0. Regarding the competition situation, it was observed that participants use goal setting (CI = 4.09 – 4.42), activation (CI = 3.97 – 4.30), automatization (CI = 3.05 – 3.48), and imagery (CI = 3.73 – 4.12) with high frequency; relaxation (CI = 2.65 – 3.21) with moderate frequency, and negative thoughts (CI = 1.99 – 2.56) and emotional control (CI = 2.18 – 2.76) with low frequency.

Inferential Analyses

Table 1 displays the correlations among the investigated psychological skills in the study.

Table 1

Correlation between psychological skills and competitive anxiety

	Cognitive Anxiety Intensity	Somatic Anxiety Intensity	Self-Confidence Intensity
Competition			
Goal Setting	-.122	-.016	.451**
Emotional Control	.791**	.751**	-.306*
Automation	.433**	.410**	.012
Relaxation	.530**	.581**	-.164
Imagery	.317*	.297*	.091
Negative Thoughts	.790**	.761**	-.285*
Activation	-.226	-.077	.459**

** p < .01
* p < .05

As evident from Table 1, self-confidence positively correlated with goal setting and activation, and negatively correlated with emotional control and negative thoughts. This indicates that athletes who clearly define their goals during competition and feel activated have higher levels of self-confidence. Conversely, more self-confident athletes paradoxically exhibit lower levels of emotional control and as expected, lower levels of negative thoughts. Furthermore, athletes with higher levels of cognitive and somatic

anxiety report higher levels of emotional control, automatization, relaxation, greater use of imagery, and more negative thoughts.

Table 2 presents the correlations between cognitive and somatic anxiety, self-confidence, and variables related to age and competitive experience.

Table 2

Correlations between age, time practicing the sport, time competing in the sport, time as an elite athlete, and competitive anxiety.

	Cognitive Anxiety Intensity	Somatic Anxiety Intensity	Self-Confidence Intensity
Age	-.094	-.074	.038
Time practicing	-.393**	-.411**	.028
Time competing	-.663**	-.647**	.163
Time as an elite athlete	-.217	-.221	.217

** p < .01
 * p < .05

As evident from Table 2, the duration of sports practice showed a moderate negative correlation with cognitive and somatic anxiety, but it did not correlate with self-confidence. Similarly, the duration of time spent competing in the sport exhibited a moderate negative correlation with anxieties and did not correlate with self-confidence. Lastly, the reported duration of being an elite athlete did not correlate with any of the variables. Additionally, no significant correlations were found between age and dimensions of Competitive Anxiety.

Finally, a statistically significant difference was observed between genders only for self-confidence (t = .34, p ≤ .001), where women reported lower levels of self-confidence (M = 2.80, SD = .40) compared to men (3.71; SD = .39). However, it is important to note that only four women participated in these studies, therefore, the consideration and interpretation of this result should be approached with caution. Hence, future studies should include larger samples of women to ensure a more accurate comparison to reality.
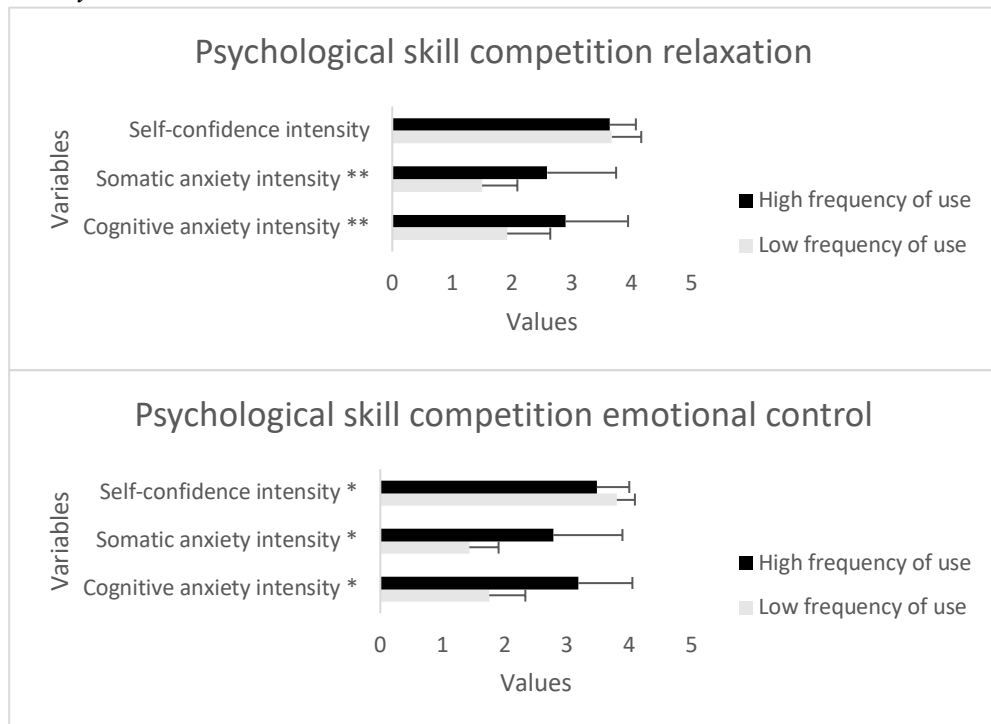
The results of descriptive analyses and MANOVA by frequency of use [low (31) vs high (33)] in competition relaxation on competitive anxiety are presented in Graphic
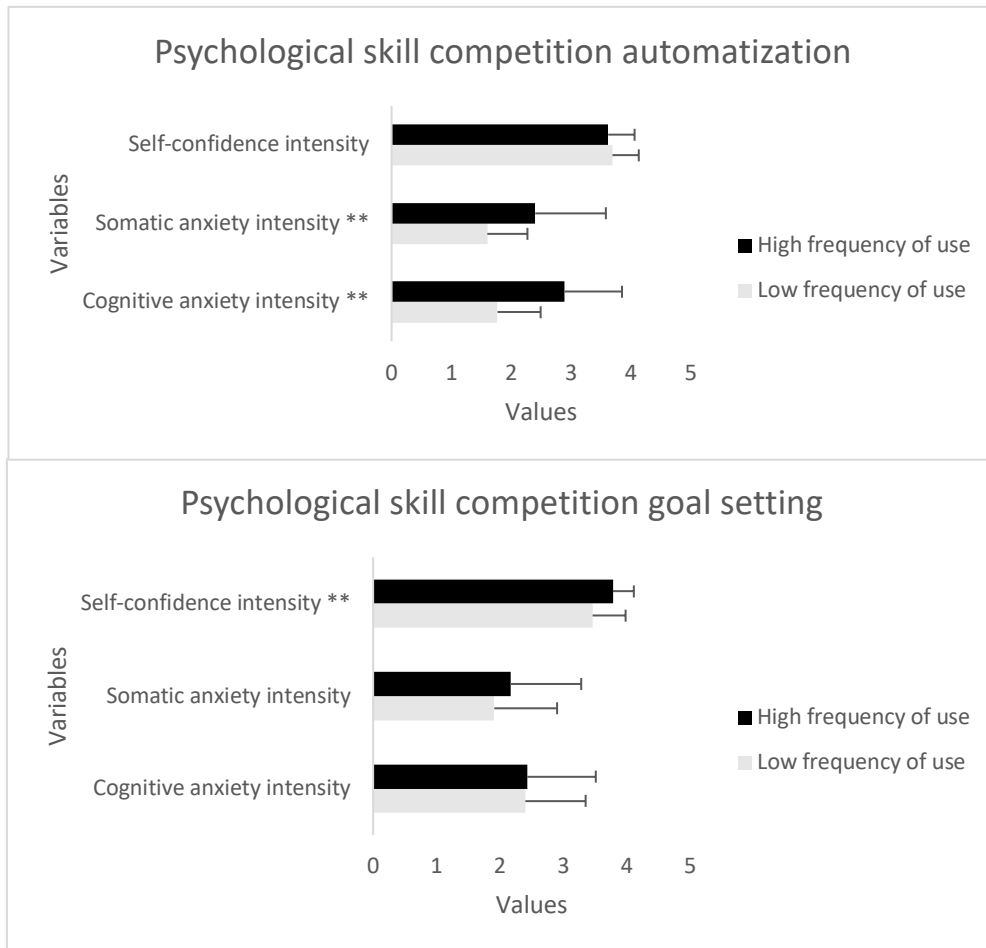
1. In the multivariate analysis, it was found that this variable had a significant effect [F $(3.60) = 7.380$, $p < .01$; Wilks' Lambda = .730, $\eta p^2 = .270$]. Subsequent univariate analysis revealed that frequency of use in competition relaxation had a significant effect on cognitive anxiety intensity [F $(1.62) = 18.326$; $p < .01$; $\eta p^2 = .228$] and somatic anxiety intensity [F $(1.62) = 18.326$; $p < .01$; $\eta p^2 = .263$], but it did not show a significant effect on self-confidence intensity [F $(1.62) = .094$; $p > .05$; $\eta p^2 = .002$].

The results of the descriptive analyses and MANOVA by frequency of use [low (34) vs high (30)] in emotional control during competition on competitive anxiety are presented in Graphic 1. In the multivariate analysis, a significant effect was observed for this variable [F $(3.60) = 25.195$, $p < .01$; Wilks' Lambda = .443, $\eta p^2 = .557$]. The subsequent univariate analysis revealed that the frequency of competitive use of the psychological skill emotional control during competition had a significant effect on cognitive anxiety intensity [F $(1.62) = 60.166$; $p < .01$; $\eta p^2 = .492$], somatic anxiety intensity [F $(1.62) = 41.369$; $p < .01$; $\eta p^2 = .492$], and self-confidence intensity [F $(1.62) = 9.639$; $p < .01$; $\eta p^2 = .135$].

Graphic 1
Effect of frequency of use (low vs high) in competition relaxation, in emotional control during competition, in automatization during competition and in goal setting during competition on competitive anxiety

Psychological skill competition automatization

Psychological skill competition goal setting
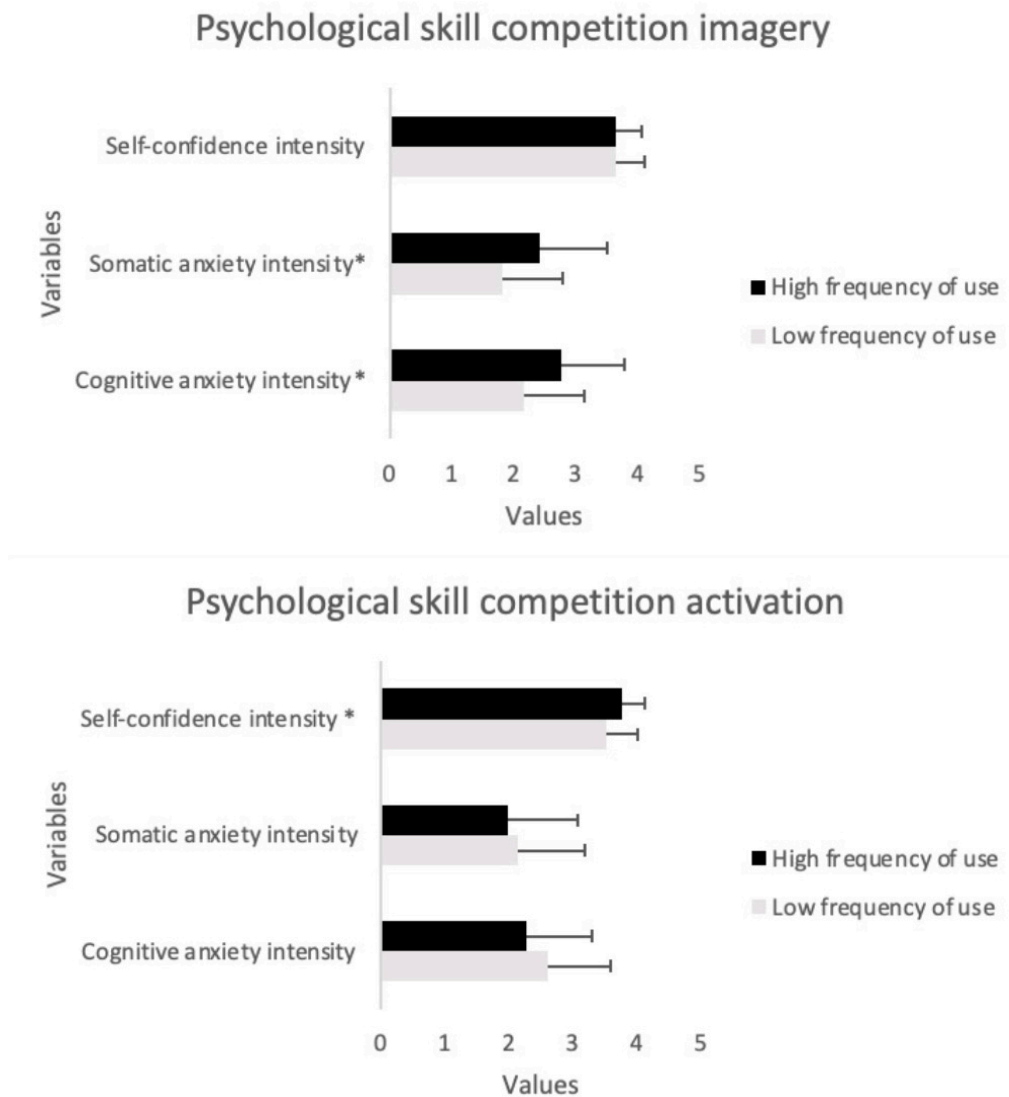
** p < .01
 *p < .05

The results of the descriptive analyses and MANOVA by frequency of use [low (27) vs high (37)] in automatization during competition on competitive anxiety are presented in Graphic 1. In the multivariate analysis, it was found that this variable had a significant effect [$F_{(3.60)} = 9.736$, $p < .01$; Wilks' Lambda = .673, $\eta p^2 = .327$]. The subsequent univariate analysis revealed that the frequency of use in the psychological skill of automatization during competition had a significant effect on cognitive anxiety intensity [$F_{(1.62)} = 25.831$; $p < .01$; $\eta p^2 = .294$] and somatic anxiety intensity [$F_{(1.62)} = 9.960$; $p < .01$; $\eta p^2 = .138$], however, it did not show a significant effect on self-confidence intensity [$F_{(1.62)} = .432$; $p > .05$; $\eta p^2 = .007$].

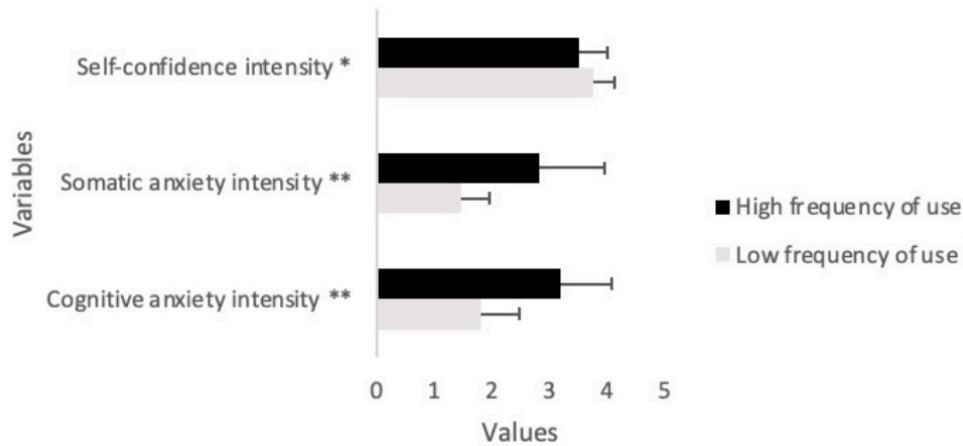The results of the descriptive analyses and MANOVA by frequency of use [low

(26) vs high (38)] in goal setting during competition on competitive anxiety are presented in Graphic 1. In the multivariate analysis, it was found that this variable had a significant effect [F (3.60) = 3.719, p < .05; Wilks' Lambda = .843, ηp² = .157]. The subsequent univariate analysis revealed that the frequency of use in the psychological skill of goal setting during competition did not have a significant effect on cognitive anxiety intensity [F (1.62) = .012; p > .05; ηp² = 0] and somatic anxiety intensity [F (1.62) = .946 p > .05; ηp² = .015], but it had a significant effect on self-confidence intensity [F (1.62) = 9.082; p < .01; ηp² = .128].

Graphic 2
Effect of frequency of use (low vs high) in imagery during competition, in negative thoughts in competition and in activation during competition on competitive anxiety on competitive anxiety on competitive anxiety

Psychological skill competition negative thoughts

** p < .01
*p < .05

The results of the descriptive analyses and MANOVA by frequency of use [low (37) vs high (27)] in imagery during competition are displayed in Graphic 2. In the multivariate analysis, it was observed that this variable did not exert a significant effect [F (3.60) = 2.056; p > .05; Wilks' Lambda = .907, ηp^2 = .093]. The subsequent univariate analysis revealed that the frequency of imagery use during competition had a significant effect on cognitive anxiety intensity [F (1.62) = 5.667; p < .05; ηp^2 = .084] and somatic anxiety intensity [F (1.62) = 5.195; p < .05; ηp^2 = .077]; however, it did not show a significant effect on self-confidence intensity [F (1.62) = .042; p > .05; ηp^2 = .001].

The results of the descriptive analyses and MANOVA by frequency of use [low (36) vs high (28)] in negative thoughts are presented in Graphic 2. In the multivariate analysis, it was found that this variable had a significant effect [F (3.60) = 18.759, p < .01; Wilks' Lambda = .516, ηp^2 = .484]. The subsequent univariate analysis revealed that the frequency of use in negative thoughts had a significant effect on cognitive anxiety intensity [F (1.62) = 50.616; p < .01; ηp^2 = .449], somatic anxiety intensity [F (1.62) = 41.990; p < .01; ηp^2 = .404], and self-confidence intensity [F (1.62) = 4.055; p < .05; ηp^2 = .061].

The results of the descriptive analyses and MANOVA by frequency of use [low (30) vs high (34)] in activation during competition are presented in Graphic 2. In the multivariate analysis, it was found that this variable did not have a significant effect [F (3.60) = 2.147, p > .05; Wilks' Lambda = .903, ηp^2 = .097]. The subsequent univariate analysis allowed us to observe that the frequency of use in activation during competition

did not have a significant effect on cognitive anxiety intensity [$F_{(1.62)} = 1.655$; $p > .05$; $\eta p^2 = .026$], nor on somatic anxiety intensity [$F_{(1.62)} = .330$; $p > .05$; $\eta p^2 = .005$]. However, it did have a significant effect on self-confidence intensity [$F_{(1.62)} = 5.359$; $p < .05$; $\eta p^2 = .080$].

Discussion

The present study aimed to describe the levels of competitive anxiety and psychological skills among participants, investigate the relationship between years of sports experience and competitive anxiety, and examine the effect of frequency of use of all psychological skills (in competition settings) on cognitive anxiety, somatic anxiety, and self-confidence in competitive elite athletes. This is one of the first studies in Brazil utilizing the Brazilian versions of the instruments: CSAI-2R and TOPS-2, providing a better understanding of the impact of frequency of use of psychological skills on somatic and cognitive anxieties and self-confidence.

Regarding the levels of competitive anxiety, athletes exhibited moderate levels of cognitive anxiety and low levels of somatic anxiety. Additionally, they reported high levels of self-confidence. This outcome aligns logically, given that these are professional elite athletes, from whom increased self-confidence and decreased anxiety levels, particularly somatic anxiety, would be expected due to their competitive experience and high performance. In fact, several studies have suggested that experienced athletes tend to have lower anxiety levels compared to inexperienced athletes (Junge & Prinz, 2018). Similarly, there have been indications that self-confidence is a key skill developed by successful elite athletes (Brewer, 2009). Moreover, a meta-analysis study (Craft et al., 2003) and the systematic review by Paludo et al. (2016) concluded that self-confidence can be a positive predictor of athletic performance. In the competitive context, studies by Fernandes, Nunes et al. (2013) and Fernandes et al. (2012), which are consistent with the findings of this research, reported that self-confidence aids athletes in managing and even reducing their levels of cognitive and somatic anxiety.

Concerning the utilization of psychological skills, it was observed that participants employ goal setting, activation, automatization, and imagery with high frequency, while relaxation is used moderately, and negative thoughts and emotional control are utilized with low frequency. Once again, these results are quite logical

considering the participation of elite athletes in the study. A similar outcome was found by Mohammadzadeh and Sami (2014) in their study involving both elite and non-elite volleyball players, where various mental skills were compared. The authors concluded that levels of psychological skills in elite volleyball players surpass those of non-elite players. They attributed this difference to the presence of experienced coaches in professional teams, who are familiar with sports psychology topics and the training of psychological skills within their teams. It can be hypothesized that the increased experience of athletes in participating in various championships contributes to the clarity of goal setting and activation of the central nervous system, as well as enhancing the automation levels of actions, relaxation, and reducing the frequency of negative thoughts.

Based on the correlation analysis, the duration of engagement in the sport exhibited a moderate negative correlation with cognitive and somatic anxiety, but it did not correlate with self-confidence. Similarly, the duration of competitive engagement displayed a moderate negative correlation with anxieties and showed no correlation with self-confidence. Thus, this outcome partially confirms the study's first hypothesis, as it was anticipated that the years of practice would decrease athletes' levels of competitive anxiety (Alejo et al., 2020; Jordet, 2017). In fact, according to Jordet (2017), an athlete's experience is the best predictor of cognitive anxiety, meaning that more experienced competitors tend to exhibit lower anxiety levels. However, the hypothesis that experience duration would correlate with increased self-confidence was not validated. It is worth noting that the investigated athletes possess relatively substantial experience in their respective sports, with an average of approximately 10 years of experience, and they also display high levels of self-confidence. Therefore, it appears that the limited variability in these two variables prevented the identification of positive or negative correlations.

Based on the main findings from the MANOVA analysis, a significant effect of usage frequency in relaxation (competition), automatization (competition), and imagery (competition) on cognitive anxiety and somatic anxiety was identified. Conversely, control of emotions and negative thoughts exhibited a significant effect, not only on anxieties but also on self-confidence. To conclude, a significant effect of usage frequency in goal setting (competition) and activation (competition) on self-confidence was also observed.

In reference to the second hypothesis of the study, our findings revealed that the frequency of utilizing relaxation techniques during competition exerted a significant

effect on both types of anxiety. The partial eta squared (ηp²) results of .228 for cognitive anxiety and .263 for somatic anxiety associated with the frequency of relaxation use during competition indicate an impact of approximately 20% to 26% on anxiety levels within the competitive environment. These outcomes find support in previous research by Hagan et al. (2017), which demonstrated that the application of relaxation techniques can inhibit inhibitory thoughts, consequently positively influencing athletes' performance (Battaglini et al., 2022; Chang et al., 2020; Fletcher & Hanton, 2001; Neil et al., 2006; Thelwell & Greenlees, 2003). Results from Liang et al. (2021) indicated that progressive relaxation training predicted a decrease in somatic and cognitive anxiety among university athletes. Similarly, Thelwell and Greenlees (2003) concluded that psychological skills training, including relaxation, was beneficial in reducing cognitive and somatic anxieties. It seems that athletes who make greater use of relaxation techniques tend to exhibit lower scores of cognitive and somatic anxieties (Hagan et al., 2017). However, in the present study, the frequency of relaxation use did not have a significant effect on self-confidence. This result could be explained by the fact that the investigated athletes were professionals and, according to Reigal et al. (2019), such athletes tend to have more stable self-confidence, which is not as sensitive to momentary situations characteristic of competitions.

In reference to the third hypothesis, it was supported in the present study as a significant effect of the frequency of emotional control use during competition on competitive anxiety was observed. The (ηp²) was .547, indicating an effect of over 50% on the variable. Similarly, concerning somatic anxiety, the (ηp²) was .438, signifying an effect of over 40% of emotional control on the variable. Lastly, the partial eta squared (ηp²) associated with the effect of emotional control on self-confidence was .135, representing a 13% effect on this variable. These data are both significant and substantial due to the partial eta squared (ηp²) values of these variables and are consistent with the findings of Khakpoor et al. (2019), who also reported that emotional regulation has an impact on competitive anxiety.

According to the fourth hypothesis, the obtained results are supported by the literature, as we observed a significant effect of the frequency of use of automatization on cognitive and somatic anxieties. However, no significant effect was observed on self-confidence. Analyzing the values of the partial eta squared (ηp²) for the frequency of use of automatization in the competitive environment, we observed a partial eta squared (ηp²)

of .294 for cognitive anxiety and .138 for somatic anxiety, indicating effects of 29% and 13% respectively on the variables. It's worth noting that under the pressure of competition, particularly in terms of cognitive and somatic anxiety, athletes often experience greater difficulty in automating their motor actions (Costa et al., 2019). However, it appears that elite athletes are trained and capable of automatizing their actions within the competition despite the significant pressure associated with high-performance sports.

Relating to the fifth hypothesis, a significant effect of goal setting was observed only on self-confidence. The hypothesis is partially supported by the literature (Kahrović et al., 2014; O'Brien et al., 2009; Pop et al., 2021; Thelwell & Greenlees, 2003), which suggests that goal setting affects anxieties (cognitive and somatic). In this study, an effect of approximately 13% [partial eta squared (ηp^2) value of .128] on self-confidence was observed. As self-confidence is the best predictor of performance, this result indicates that goal setting can enhance individual and collective task performance, potentially leading to improved overall performance.

Concerning the sixth hypothesis, a significant effect of imagery frequency of use on cognitive and somatic anxieties was observed. When analyzing the partial eta squared (ηp^2) values in the competitive environment, an effect of 8% (.084) for cognitive anxiety and 7.7% (.077) for somatic anxiety was observed. Thus, the hypothesis is partially supported in this study and is consistent with the findings of several studies (Hagan et al., 2017; Kuan et al., 2018; Mohammadzadeh & Sami, 2014; Saemi et al., 2011; Thelwell & Greenlees, 2003) indicating that elite athletes used imagery activities intensively to cope with anxiety, enhance self-confidence in sports, aiming to improve performance and achieve success.

The seventh hypothesis was also supported in this study, as a significant effect of negative thought frequency of use (in competitions) on cognitive and somatic anxieties, as well as on self-confidence, was observed. When analyzing the partial eta squared (ηp^2) results, it is evident that the variable had an effect of nearly 45% (.449) on cognitive anxiety, 40% (.404) on somatic anxiety, and 6% (.061) on self-confidence. These findings are corroborated by the research of Vesković et al., (2019), which examined the effect of psychological skills development programs on anxiety control and increased levels of self-confidence in elite karate athletes. They emphasize the importance of emotional self-regulation as a crucial factor in the preparation of elite athletes. There are suggestions that

negative thoughts are integrated within emotional self-regulation (Batista & Noronha, 2018), as this process can be understood as a dynamic one intrinsically linked to conscious efforts to control behaviors, feelings, and emotions to achieve a certain goal, with negative thoughts acting against emotional self-regulation.

Finally, the eighth hypothesis was partially supported in this study, as a significant effect of activation frequency of use (in competitions) on self-confidence was observed. This indicates that athletes who more frequently utilize their state of activation also report higher levels of self-confidence. When examining the partial eta squared (ηp^2) scores for the competition environment, the effect was 8% (.080) on self-confidence. These findings are in line with the results presented by the study of Saemi et al. (2011), which found a positive and significant correlation between self-confidence intensity and activation, suggesting that good levels of activation lead to increased self-confidence in competitions (Calmels et al., 2003).

The current study has several limitations, including: 1) the study sample consisted mostly of male athletes; 2) the study employed a cross-sectional design; 3) the sample included athletes from various sports disciplines; 4) the sample included both individual and team sports athletes; 5) the majority of the sample consisted of football athletes. Therefore, it is suggested that future studies use a larger and more balanced sample in terms of gender and sports disciplines. In terms of practical implications, this study contributes to clarifying the relationship between the frequency of use of psychological skills and competitive anxiety among elite athletes. The findings from this study suggest that sports psychologists should develop skill enhancement programs targeting psychological skills to manage anxiety and enhance self-confidence, aiming to optimize the performance of elite athletes.

Final Considerations

Based on the findings of the current study, we identified a significant effect of the frequency of use in relaxation, automatization, and imagery on cognitive and somatic anxiety. On the other hand, negative thoughts and emotional control exhibited a significant effect, not only on anxieties but also on self-confidence. Furthermore, goal setting and activation demonstrated a significant effect solely on self-confidence.

These findings hold significant implications for Sports Psychology in Brazil, as

they suggest that psychological skills can influence competitive anxiety. According to the theoretical model proposed in this study, competitive anxiety consists of cognitive and somatic anxieties, as well as self-confidence. Moreover, there exists theoretical consensus (Lochbaum et al., 2022; Ong & Chua, 2021; Paludo et al., 2016; Rice et al., 2019) that self-confidence is the best predictor of performance. Consequently, this study offers a pathway for Sports Psychology, specifically in the form of a psychological skills development program aimed at assisting athletes in achieving adequate levels of self-confidence to maximize their performance.

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