COMPETITIVE ANXIETY AND SELF-EFFICACY IN YOUNG VOLLEYBALL PLAYERS: A SEASON TREND STUDY OF THEIR RECIPROCAL EFFECT ON MATCH OUTCOMES

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Abstract:

The aim of this study was to evaluate: i) the changes and interrelationships of competitive anxiety (CA) and self-efficacy responses; and ii) the predictive power of these variables and the competitive context in predicting match-by-match performance of a volleyball team in an entire season. The sample consisted of 15 Brazilian high-performance male volleyball players (U-18). The outcomes were somatic CA, cognitive CA, and self-confidence measured with the Competitive Anxiety Questionnaire in Sports (CSAI-2R), and self-efficacy, assessed with the Individual Self-Efficacy Scale for Volleyball. The athletes answered the questionnaires before each match during the season (N=24 matches). The athletes presented higher somatic and cognitive CA and lower self-confidence at the beginning of the competitive phase. Trend-repeated measures analysis showed seasonal variations with a decrease in somatic (~57%) and cognitive (~62%) CA and increase in self-confidence (~40%) and self-efficacy (~16%). Self-efficacy presented a high and positive correlation with self-confidence (rho=0.56, p<.05), but did not correlate with CA. Binary logistic regression revealed that previous matches with an "easy" degree of intensity (i.e., 3-set duration) estimated a 230% increase in the chance of winning the next match compared to previous matches with "moderate intensity" (i.e., 4-set duration). The likelihood of wins in the morning matches was 152% more likely as compared to afternoon matches. Winning odds increased about 3% for every 1-unit increase in precompetitive self-efficacy and decreased 12% for each somatic CA 1-unit increase. It is concluded that the degree of intensity of previous contests (regardless of the match outcome) and match day period seem to interact with self-efficacy. Understanding seasonal variations and the transient competitive context enables better management of athletes' psychological skills.

Key words**:** *performance, team sports, CSAI-2R, repeated measures analysis*

Introduction

Volleyball is a team sport with intermittent characteristics, in which the main actions of the game are performed at high intensity involving successive jumps, multidirectional movements, and lower limb power associated with explosive strength. Alongside this high physical demand, volleyball features a high degree of complexity and cognitive requirement due to the unpredictability of opponent actions and reactive decision-making process (Andrade, Fernandes, Miranda, Coimbra, & Bara Filho, 2021; Costa, et al., 2017; Fortes, Fiorese, Nascimento-Júnior, Almeida, & Ferreira, 2019; Marcelino, Mesquita, & Sampaio, 2011). In addition to the inherent physical and mental fatigue associated with volleyball, the competitive nature of the sport (including travel, disruption of routines, rival fans, and the pressure of results) and the rapid rate of information transfer with coaches and team-mates require players to manage a range of skills. As a result, coping with the physical, perceptual-cognitive, and logistical demands of competitive

sport can lead to increased anxiety during training sessions and especially during the major competitions of the season (Andrade, Bevilacqua, Coimbra, Pereira, & Brandt, 2016; Aoki, et al., 2017; Brazo-Sayavera, et al., 2017; Fortes, et al., 2021).

Competitive anxiety (CA) can be defined as a perception of competitive situations as threatening, in which athletes generally respond by feeling apprehension and physiologically aroused (Martens, Vealey, & Burton, 1990). The current consensus is that CA comprises three distinct dimensions: cognitive CA, characterized by elements such as worrisome thoughts, negative self-evaluations, and uncertainties regarding performance; somatic CA, manifested through physical activation, tension, and an elevated heart rate; and self-confidence, denoting the athlete's belief and assurance in their own capacity to perform (Brandão & Amaro 2023; Fernandes, Nunes, Raposo, Fernandes, & Brustad, 2013; Martens, et al., 1990). In a systematic review of 27 studies, Rocha and Osório (2018) found that individual differences in athletes' CA levels could be explained by sociodemographic (i.e., gender and age), sporting profile (i.e., experience, previous performance), and sport context (i.e., type of sport and match intensity).

In this sense, CA and its relation with performance have been widely studied by researchers in the field of sport psychology (Chuang, Huang, & Hung, 2015; Englert & Bertrams, 2012; Fernandes, et al., 2013; Fortes, Lira, de Lima, Almeida, & Ferreira, 2016; Fortes, et al., 2017; Franklin, Smith, & Holmes, 2015). For example, cognitive CA in elite athletes has a weak and inverse correlation with performance, while for the European club level, somatic CA has a stronger and positive correlation with performance (Craft, Magyar, Becker, & Feltz, 2003). One possible explanation is that cognitive CA can predispose athletes toward aversive self-appraisals and disruptions in attention processing, while somatic CA may have a curvilinear relationship with performance. In other words, it can affect performance in the moments before the competition, but dissipate after the beginning of the game (Barrett, Kannis-Dymand, Love, Ramos-Cejudo, & Lovell, 2023).

Given that CA can exhibit a direct correlation with sports performance (Costa, Fernandes, Silva, & Batista, 2019; Craft, et al., 2003; Fortes, et al., 2019) or be associated with other psychological variables (Chun, Lee, Kim, Cho, & Lee, 2022), it becomes imperative to explore additional variables that could be interconnected with or mediating the relationship between CA and performance. For example, Brandão and Amaro (2023) found that cognitive reappraisal, a component of emotion regulation, was significantly associated with self-confidence, whereas extroversion (personality) was significantly associated with somatic CA.

In the context of sport, self-efficacy emerges as an important component linked with athletes' performance (Đurović, Popov, Sokić, Grujić, & Aleksić Veljković, 2021; Moritz, Feltz, Fahrbach, & Mack, 2000; Reverdito, et al., 2023; Sivrikaya, 2019). Self-efficacy can be conceptualized as the individual's belief in his/her ability to perform a specific task successfully that will lead to desired outcomes (Bandura, 1997). Self-efficacy has been described as one of the most influential psychological variable for sport performance (Moritz, et al., 2000; Mouloud & El-Kadder, 2016), with moderate to large correlations and reciprocal effects (Moritz, et al., 2000). This means self-efficacy can arise from a previous positive outcome, and simultaneously this self-efficacy appears to promote better subsequent performance (Lochbaum, et al., 2022). Additionally, as proposed by Bandura in the Social Cognitive Theory (Bandura, 1997), self-efficacy stems from four sources: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states.

One of the ways in which athletes' self-efficacy can influence their performance is through the potential role to regulate positive emotional states, such as pleasure and satisfaction, and negative emotional states, such as boredom and CA (Feltz, Short, & Sullivan, 2008). CA can adversely affect self-efficacy, and the possibility of diminished self-efficacy may in turn exert a negative impact on sports achievement. Conversely, how this relationship occurs is still poorly investigated. Chun et al. (2022) showed that cognitive and somatic CA had a negative correlation with perceived performance, while self-confidence showed a positive correlation with perceived performance. On the other hand, self-confidence can positively influence the relationship between CA and performance. Additionally, higher levels of self-efficacy can help athletes become less susceptible to the negative effects of CA during matches, thus improving performance (Besharat & Pourbohlool, 2011).

Valiante and Morris (2013) investigated the importance of previous performances in the sources of self-efficacy in golfers. The golfers were able to maintain high levels of self-efficacy for a long time by recalling successful events. According to Sivrikaya (2019), the maintenance of these self-efficacy levels suggests that previous experiences can benefit athletes' performance, and this benefit can remain for a long time. Sivrikaya (2019) found that self-efficacy is necessary for the success of athletes, because the belief that a person has about his/her power to affect the situation influences the way that person faces challenges competently, making better choices. In this regard, these connections should be strengthened when working with young athletes. Furthermore, young athletes, who have less deliberate practice time compared

to professionals, may be vulnerable during match days, which potentially impacts their psychological well-being, tactical comprehension of the game, and perceptual-cognitive skills, thus adversely affecting performance (Rice, et al., 2016; Rocha & Osório, 2018). Interestingly, competitive anxiety (CA) and self-confidence have not yet been evaluated as potential sources of self-efficacy that can influence athletes' performance. Understanding how these psychological demands and contextual variables from previous matches influence performance could assist youth volleyball players in managing their emotions, developing cognitive routines, and filtering out irrelevant stimuli to maximize their chances of winning.

In addition, the seasonal variation effect of athletes' CA may coexist with peak training loads, poor recovery, and proximity to major competition. Thus, understanding transient and psychological performance-dependent behavior throughout the season emerges as another skill demanded by coaches.

Therefore, the present study aimed to evaluate the seasonal change and the interrelationship between CA, self-efficacy, and the predictive explanatory power of these psychological variables and the competitive context in predicting the next game performance throughout the season in a young volleyball team. Considering the contextual variables, we hypothesized that: i) self-confidence response will correlate with self-efficacy; ii) competitive anxiety (somatic and cognitive), self-confidence, and self-efficacy are predictors of winning matches.

Methods

Participants

A total of 15 male athletes from the Under-18 category of a professional elite volleyball team in Brazil participated in this study (mean age: 16.29±1.72 years; range 15 to 17 years; weight: 71.8±5.4 kg; height: 182.3±3.7 cm; %body fat: 11.8±5.6%). The volleyball team was selected by convenience. The team participated in state- and national-level competitions (i.e., the Superliga, the most important volleyball championship in Brazil); and one athlete of this sample represented the Brazilian team in international championships. At the time it was surveyed, the sampled team was among the top three in the state-level competitions. The inclusion criteria for this study were the following: being an athlete on the team; training routinely; and participating in at least 10 matches during the competitive season. The exclusion criterion was injury during the season and missing more than 15% of the training sessions. All athletes and their legal guardians signed an informed consent term attesting to their voluntary participation. The study was approved by the Ethics Committee on Research in Human Beings, protocol number (663 188/2014), in accordance with the Declaration of Helsinki.

The young athletes trained five days a week, from Monday to Friday, 2-3 hours a day, in the afternoon (Table 1). In training sessions, they performed physical, technical, and tactical exercises with and without the ball. In addition, the athletes had strength training three times a week for one hour, and functional, core, and mobility training twice a week. The complete season schedule is shown in Figure 1.

Experimental approach

We followed an observational study design with the study's deductive logic launched *a posteriori*. Thus, the technical staff and participants received no feedback from the research team. On the day of the presentation of the team for the season, after consent from the technical committee, the researchers explained the study objectives, promoted familiarization with the instruments, and any doubts were clarified.

The athletes completed the Individual Self-Efficacy Scale for Volleyball (Carmo, 2006) and the Competitive State Anxiety Inventory – 2, short version (CSAI-2R) developed by Martens et al. (1990) and translated, adapted, and validated for Brazilian athletes by Fernandes, Vasconcelos-Raposo, and Fernandes (2012) before all matches

Table 1. Overview of the scheduled activities (e.g., strength training, technical and tactical training, and competitions) during a typical training week for the team

Days/hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
2 to 3 p.m.	ST	FCM	ST	FCM	ST	OFF	OFF
3 to 5 p.m.	Setting and receiving the serve/ attacking, digging and blocking/ serving; TT	Setting and receiving the serve/ attacking, digging and blocking/ serving; Tactical	Setting and receiving the serve/ attacking, digging and blocking/ serving TT	Setting and receiving the serve/ attacking, digging and blocking/ serving; Tactical	Setting and receiving the serve/ attacking, digging and blocking/ serving; TT		

Note: ST: strength training; FCM: functional, core, and mobility training; TT: technical and tactical training.

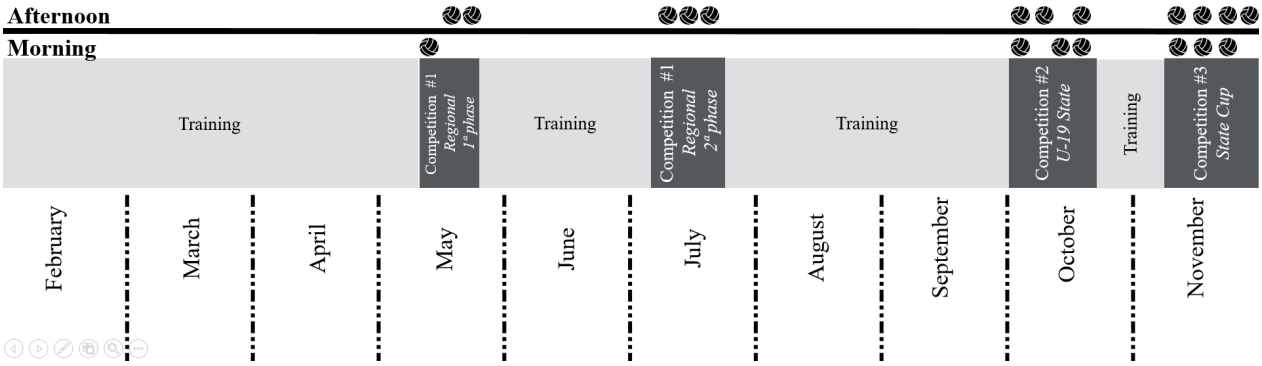


Figure 1. Season schedule.

played by the team throughout the season. The athletes familiarized themselves with the questionnaire before commencing data collection. Athletes were approached individually about an hour before the start of each match. It took an average of 10 minutes to complete the questionnaires. The researchers remained at the data collection site throughout the procedure. All athletes were familiarized with the instruments.

The team was monitored in all championships during the training season. The team participated in three championships, with 24 matches during the entire competitive season. The total duration of the sampled season was 10 months (February to November). The first games of each championship were excluded for the trend-repeated measures analysis of the effect of previous match context outcome. Thus, 19 matches were considered for this analytical approach. Our purpose was to explore the change throughout the season in the psychological skills variables, their intercorrelation and predictive power in the competitive context for performance in the next match by data modelling.

Procedures

Monitoring self-efficacy

The Individual Self-Efficacy Scale for Volleyball (Carmo, 2006) is composed of eight items that question the athlete about the degree of confidence they have in their ability to perform important skills in the game. Each answer contains a Likert scale of 11 points, ranging from 0 = "I cannot do it at all" to 10 = "of course I can do it". Carmo (2006) did the process of adaptation and validation for Portuguese language and the scale presented an internal consistency of α= 0.80 for pass hitters, middle blockers, outside hitters, and setters, demonstrating applicability for a Brazilian sample.

Monitoring competitive anxiety

We used the CSAI-2R translated and validated into Portuguese by Fernandes et al. (2012) to measure the somatic and cognitive CA and self-confidence levels. This instrument consists of 17 Likert-type questions, in which the subject chooses: 1 = *nothing*, 2 = *something*, 3 = *moderate*, and 4 = *very*, according to the question. A score of three subscales (cognitive CA, questions 2, 5, 8, 11, and 14; somatic CA, questions 1, 4, 6, 9, 12, 15, and 17, and self-confidence, questions 3, 7, 10, 13, and 16) is obtained from the sum of responses, with scores ranging from 5 to 20 for the cognitive CA and self-confidence levels, and 7 to 28 for the somatic CA level.

Competitive context variables

Three competitive situational exploratory variables relating to the previous match (degree of intensity and its outcome) and match day period (morning and afternoon) were considered. The assignment of degree of intensity of the previous match followed the classification: "easy", matches with three sets (3x0); "moderate", matches with four sets (3x1); and "difficult", matches with five sets (3x2). The attribution of the match intensity was considered in previous studies (Arruda, Aoki, Freitas, Coutts, & Moreira, 2013; Debien, et al., 2018; Kelly & Coutts, 2007; Lima, Silva, Afonso, Castro, & Clemente, 2020). This variable was categorized independently of the match result. Thus, the previous match outcomes were categorized as lost or won. The same binary response was assigned to the next match that was used as the dependent variable. The final analysis included 296 individual data items.

Statistical analysis

Data are presented as mean ± standard deviation, median, interquartile range, counts, and percentage (%). The smallest worthwhile change (SWC) was characterized as 0.5 x within-player SD of magnitude of deviation from trend line responses during the season. Effect magnitudes (± 90% CI) were classified according to standard criteria: trivial = 0.0–0.2; small = 0.2–0.6; moderate = 0.6–1.2; large = 1.2–2.0; very large = 2.0–4.0; and extremely large > 4.0 (Hopkins, Marshall,

Batterham, & Hanin, 2009). Chances of change over time from deviation from season trend line were assessed qualitatively as follows: <0.5%, most unlikely; 0.5-5%, very unlikely; 5-25%, unlikely; 25-75%, possibly; 75-95%, likely; 95-99.5%, very likely; >99.5%, most likely (Hopkins, et al., 2009). Changes of less than the SWC were considered trivial, and where the 90% CI overlapped positive and the negative thresholds simultaneously, the effect was deemed unclear. Spearman's test (rho) using p-value adjustment by the Holm (1979) method was used to verify the correlation between the variables. The rho's confidence intervals were calculated by bootstrap (1000 within-individuals resamples; 95% CI_{boot}) using the normal approximation criterion. The rho coefficient was evaluated as proposed by Hopkins et al. (2009): <0.10 (trivial), 0.10 to 0.30 (low), 0.31 to 0.50 (moderate), 0.51 to 0.70 (high), 0.71 to 0.90 (very high), 0.91 to 0.99 (almost perfect), and 1 (perfect). A binary logistic regression was fitted with match outcome win ("yes"/"no") as the dependent variable to quantify the effects of exploratory precompetitive and competitive context variables, with self-efficacy, CA (cognitive, somatic, and self-confidence), previous match outcome, match day period and intensity level as covariates in our regressions. The model simplification method adopted was the stepwise-selected lowest Akaike information criterion (AIC) (Venables & Ripley, 2002). Each individual predictions effect size (ES) was obtained by Cohen's odds ratio and interpretation was according to the values |OR| <1.44, very small; |OR| = 1.44 < 2.48, small; |OR| = 2.48 ≤ 4.27, medium; and |OR| > 4.27, large (Cohen, 1988). Statistical significance was set as p<.05. All data analyses were conducted using the R statistical programming language (version 4.1.0; R Foundation for Statistical Computing, Vienna, Austria).

Results

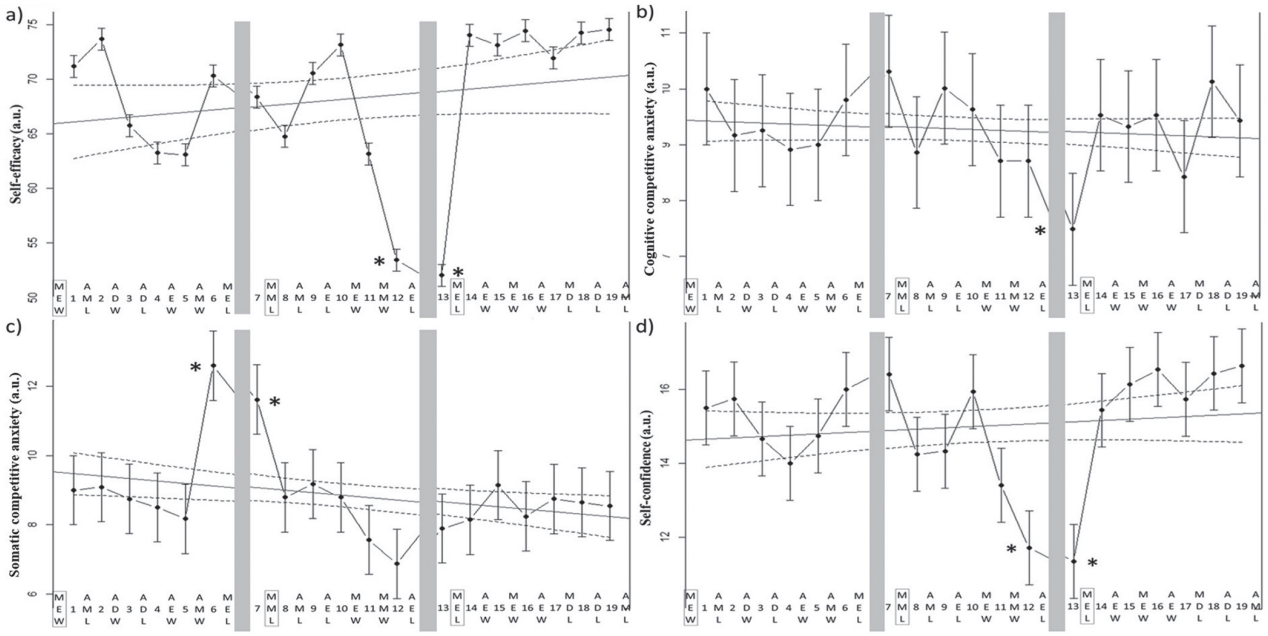
Table 1 reports the descriptive characterization of the sample and competitive context variables under the season period analysis.

Figure 2 presents the repeated measures analysis of psychometric responses and changes from the trend line during the competitive season. As expected, magnitude-based inferences about somatic CA showed a "very likely higher" response at the beginning of the competitive season with an estimated difference of 3.5 a.u. to the decreasing trend line (p<.001). A transient season effect was noted with a significant decrease for self-efficacy (-15.1 a.u.) and self-confidence (-3.4 a.u.) responses between matches 12 and 13 (state-level champ-

Table 2. Descriptive characterization of the psychometric responses and competitive context

Characteristic	mean ± SD [Median (IQR)]
Psychometrics	
self-efficacy (a.u)	68 ± 16 [72 (66, 77)]
competitive anxiety	
cognitive (a.u)	9.2 ± 3.6 [9.0 (7.0, 11.0)]
somatic (a.u)	8.8 ± 3.1 [8.0 (7.0, 10.0)]
self-confidence (a.u)	14.9 ± 4.1 [15.0 (14.0, 17.0)]
Competitive context	
score, studied team (unit)	66 ± 14 [64 (55, 75)]
score, opponent (unit)	68 ± 17 [65 (62, 83)]
match length (minutes)	84 ± 17 [81 (72, 88)]
rally (/min)	0.57 ± 0.04 [0.58 (0.54, 0.60)]
period of the day	**n (%)**
afternoon	12 (63%)
morning	7 (37%)
team results	
loss	11 (58%)
win	8 (42%)
intensity degree of previous matches*	
easy	11 (58%)
moderate	5 (26%)
difficult	3 (16%)

Note: SD: standard deviation. IQR, interquartile range. * Includes the first four matches of each championship in the season, which was only used for the purpose of exploratory predictive variables. All other reports consider the 19 analyzed matches.



Note. In the panel: a) self-efficacy; b) cognitive competitive anxiety; c) somatic competitive anxiety; d) self-confidence. a.u. = arbitrary unit. On the x-axis, the numeric value represents the season sequence of the matches considered in analysis (n=19); the top, middle and bottom categorical value represents the match period (M= morning; A= afternoon), degree of intensity of previous matches (E= easy; M= moderate; D = difficult) and match outcome (L = lost game; W = won game), respectively. Categorical values within rectangular frames represent those matches that start a new competition and were used only for predictive analyses. Gray columns represent the time between competitions. * Represents data points for analyzed matches with qualitative inference (all cases with very likely higher/very likely lower; p<.001) for increased/decreased response from magnitude of deviation from trend line over the competitive season. Qualitative inference represents the likelihood that the true value will have the observed magnitude according to Hopkins (2009).

Figure 2. Trend line and magnitude-based inferences for psychometric responses over the competitive volleyball season.

Table 3. Regression coefficients with the result of the match as reference

	Wins (=yes)			
Predictors	*Odds ratios*	*CI*	*p*	*Effect size*
(Intercept)	0.12	0.02 – 0.50	<0.001	
previous match: *difficult*	2.44	0.92 – 6.52	0.071	*small*
previous match: *easy*	3.30	1.54 – 7.43	0.003	*medium*
match period: *morning*	2.52	1.27 – 5.06	0.009	*medium*
self-efficacy	1.03	1.07 – 2.19	0.024	*very small*
competitive anxiety: somatic	0.88	0.47 – 0.97	0.038	*very small*
AIC		273.603		
log-Likelihood		-130.802		

Note: The reference level of the previous match's difficulty degree and match period. Related factors are "moderate" and "afternoon", respectively. Effect size (ES) was obtained by Cohen's odds ratio rules and interpretation was according to the values |OR| <1.44, very small; |OR| = 1.44 < 2.48, small; |OR| = 2.48 ≤ 4.27, medium; and |OR| > 4.27, large (Cohen, 1988).

ionship matches) with a "very likely lower" magnitude (p<.001). At the same time there were cognitive CA responses outside the trend line with "very likely higher" magnitudes (-1.7 a.u.; p<.001). Prior to this transient behavior of the aforementioned divergent psychological responses, confrontations with magnitudes rated as "difficult" and an irregularity in performance (i.e., wins and losses) can be observed.

When performing the Spearman test, it was found that self-efficacy presented a high and positive correlation with self-confidence (rho= 0.56; p<.001, 95% CI_{boot} [0.45, 0.66]) and non-significant correlation with cognitive CA (rho= 0.01; p>.05, 95% CI_{boot} [-0.14, 0.15]) and somatic CA (rho= 0.05; p>.05, 95% CI_{boot} [-0.08, 0.19]). Cognitive CA was moderately correlated to somatic CA, rho= 0.36; p<.001, 95% CI_{boot} [0.24, 0.48] and low and negatively correlated

with self-confidence (rho= -0.24; p<.01, 95% CI_{boot} [-0.39, -0.09]). Somatic CA and self-confidence were non-significant (rho= 0.06; p>.05, 95% CI_{boot} [-0.09, 0.21]). Age presented a low and negative correlation with cognitive CA (rho= -0.29; p<.001, 95% CI_{boot} [-0.41, -0.18]) and non-significant correlation with the two other CA constructs (somatic CA, rho= -0.13; p>.05, 95% CI_{boot} [-0.26, 0.01]; self-confidence (rho= 0.01; p>.05, 95% CI_{boot} [-0.14, 0.13]). Age presented a non-significant correlation with self-efficacy (rho= -0.08; p>.05, 95% CI_{boot} [-0.21, 0.04]).

In the binary logistic regression, the covariables "previous match outcome", cognitive CA and self-confidence were removed in the final model fitted for the next match outcome prediction. The final model correctly classified 70% of the cases. After adjusting for all predictors, the odds ratio for match period indicated that the likelihood of wins in the morning was 152% more likely as compared to the afternoon. The "easy" degree of intensity in previous matches showed that the odds of winning in the upcoming game was 230% more likely as compared to moderate intensity. The odds of winning increase by about 3% for every 1-unit increase of self-efficacy. Moreover, the odds of winning decreased 12% for every 1-unit increase of precompetitive somatic CA. Regression coefficients are presented in Table 2. The qualitative interpretation of these odds ratios indicated an effect size of "very small" to "medium" magnitude.

Discussion and conclusion

The present study aimed to evaluate the seasonal change and the interrelationship between competitive anxiety, self-efficacy, and the competitive context to predict the next game performance throughout an entire competitive season in a young volleyball team.

The first hypothesis was confirmed, as self-efficacy presented a high and positive correlation with self-confidence. The repeated measures data analysis, with evidence-based magnitude, shows that the athletes presented higher somatic and cognitive CA values at the beginning of the season and lower self-confidence values in the same period. According to the season trend lines, there was a decrease in somatic and cognitive CA levels and an increase in self-confidence and self-efficacy levels with transient response related to the match outcome. The second hypothesis was partially confirmed. An increase in self-efficacy and decrease in somatic CA were very small predictors of winning matches. Furthermore, the morning period of the matches increased the team's probability of winning (152%) and the other variables were constant.

It was possible to observe that the lowest mean of self-efficacy was in the first half matches of the season, until match number 13. However, throughout the season, "easy matches" (with three sets) increased the team's chances of winning by 230%, and there was a 3% increase in winning chances for every 1 point scored on the self-efficacy scale. Aligned with this, self-efficacy levels started to rise after the 13th game of the season (as shown in Figure 1), and even after losing some matches, these levels did not decrease. Moritz et al. (2000) summarized the reciprocal relationship between self-efficacy and performance. Changes in perceptions of self-efficacy result from cognitive information processing about past successes, which leads to increased self-efficacy through the acquisition of skills and the comparison of results (Azzi, Bandura, & Polydoro, 2008). In other words, success breeds success (Zhao & Zhang, 2023). Sivrikaya (2019) found that maintenance of these self-efficacy levels suggests that previous experiences can benefit athletes' performance, and this benefit can remain for a long time. The results indicate that athletes can potentially raise and sustain their self-efficacy levels throughout the season. Data analysis shows that the results of the matches and how the victory occurred (e.g., easy, moderate, or difficult) were determinants for the increase in these self-efficacy levels.

Athletes with high self-confidence tend to report low cognitive and somatic CA levels (Fernandes, Vasconcelos-Raposo, & Fernandes, 2014; Marín-González, Portela-Pino, Fuentes-García, & Martínez-Patiño, 2022). A low and negative correlation between cognitive CA and self-confidence was confirmed in the current study. In addition, we found a high and positive correlation between self-confidence and self-efficacy. The high self-confidence and self-efficacy and the low CA levels presented reinforce an athlete's perceived ability to deal with stress and CA before the game, helping the athlete to perform their sporting tasks with more success and perform better during the game (Besharat & Pourbohlool, 2011). Craft et al. (2003) showed that self-confidence before the match was associated with low CA and correlated with better performance during the match. Competition results in increased CA levels in athletes; however, they provide positive effects on performance when associated with high self-confidence and self-efficacy levels (Souza, Rech, Sarabia, Añez, & Reis, 2013).

The main result of the present study was the high and positive correlation between self-efficacy and self-confidence. Additionally, the increase in self-efficacy level and decrease in somatic CA levels are predictors of winning matches for these athletes. This makes sense, since CA can reflect the athlete's perception of the importance of competition for themselves or for the team and the degree of concern about the game (Souza, et al., 2013). Somatic CA dissipates during the match due to positive performance responses, favoring self-confidence and influencing self-efficacy.

In a similar approach, Besharat and Pourbohlool (2011) performed a regression analysis for the moderating effect of sport self-efficacy between CA and sport performance. The authors found that only cognitive CA in the equation (step 1) determined a significant negative prediction for sport performance (β=–0.328; R^2= 10%). However, when self-efficacy was entered into the equation (step 2), the authors found a significant moderating effect (R^2= 0.56) on sport performance, as self-efficacy completely changed the significant relations between cognitive CA and sport performance. These results indicate that increasing sport self-efficacy levels decreases the negative association of cognitive CA with sport performance. The authors argue that one reason for these results is that sport self-efficacy can help athletes to be less affected by CA during the match, and therefore perform better (Besharat & Pourbohlool, 2011).

Previous studies have suggested that sociodemographic variables (gender, age, and nationality), athletes' profile (experience, competition level, previous performance, ability to deal with feelings of apprehension), and sport context (type of sport, modality, opponent's level) can influence CA (Guillén & Sánchez, 2009; Parry, Chinnasamy, Papadopoulou, Noakes, & Micklewright, 2011; Ramis, Torregrosa, & Cruz, 2013). Higher levels of CA were observed in athletes who presented worse previous performance, competition in away matches and versus higher opponent's level, influencing performance. However, evidence has not been found to date about diurnal variations in CA and their influence on outcomes achieved (win or lose). Thus, the variables were compared in relation to the turns in which the match took place to verify whether the match period could also influence the match result of young athletes.

For these athletes, the morning period increased the team's probability of winning (152%). The effects of time of day on aerobic performances are conflicting, while it seems that peak values of anaerobic performance are presented in the afternoon-evening (Chtourou & Souissi, 2012). However, regular training at a particular time of day influences diurnal variations.

Practical application

First, in terms of practical application, it is recommended to align the training time with the competition time, aiming to adapt performance to that specific period of the day. Moreover, implementing a pre-performance routine before the match can help regulate the activation level. Second, Reverdito et al. (2023) discovered a positive relationship between increased self-efficacy and higher levels of perceived sport satisfaction. This sense of satisfaction can in turn directly affect decisions regarding continued engagement in sport activities, which is a primary objective among young athletes.

This study has some limitations. The main limitation involves analyzing the team as a unit. Individualized specialization is possible at this level of performance, and the analysis could relate to specific player positions. However, the small sample size made this analysis difficult. Despite this, using bootstrap methods enhanced the reliability of the findings. Second, self-efficacy was assessed using a validated volleyball-specific scale, and performance was evaluated based on match outcomes (win or loss). Future studies should investigate the agreement between the self-efficacy scale and specific tasks performed in volleyball games. Finally, competitive anxiety (CA) in this age group may arise from life context, including school and family, rather than solely from one's own skills or task-related perceptions. Investigating the origins and respective contributions to CA is recommended.

Based on the data analysis, we can conclude that self-efficacy highly correlates with self-confidence (r=0.56) during the entire season, and the context of previous matches has a great influence on the result (win or lose) of the following match. The "easy" intensity level in the previous match shows that the chances of winning greatly increased (230%) in the next matches compared to the previous match with moderate intensity. Likewise, the chance of winning a match in the morning was 152% higher than in the afternoon. Furthermore, the increase in self-efficacy level and decrease in somatic CA levels are predictors of winning matches. These results are very important, as they allow technical staff to know how to enhance the psychological well-being of young volleyball athletes when they work in this context. When carrying out a repeated measures analysis, understanding which situations increase the chances of winning, such as games in the morning, and the level of influence of a previous game on the team's emotional states, is extremely important to continue optimizing the team's performance.

In an applied approach, the results of the present study reinforce the importance of regular participation of young volleyball athletes in championships to develop self-efficacy and self-confidence. An important result is the ecological validity of this research. Data were assessed with repeated measures analysis in a real context of competitions of an Under-19 category of a professional elite volleyball team in all matches of the season. In this sense, coaches, sport psychologists, and athletes should view an adequate level of self-efficacy and somatic CA as a possible facilitating factor, and this could consequently increase athletes' performance.

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