SPORT TK-EuroAmerican Journal of Sport Sciences

https://revistas.um.es/sportk Online ISSN: 2340-8812

Received: **08/10/2022.** Accepted: **24/07/2023.** Published: **30/07/2024**

Self-efficacy of high-performance volleyball athletes

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ABSTRACT

Self-efficacy determines the regulation of athletes' thinking patterns and how they will behave to achieve their goals in the face of adversity. The aim of this study was to analyze the relationship between volleyball self-efficacy and the performance efficacy of athletes from high-performance teams at distinct moments of the season. This descriptive correlational study included sixty-five athletes of both sexes (26.20±5.51 years old) from four teams competing in the 2017/2018 Men's and Women's Superliga. The Volleyball Self-Efficacy Scale (VSES) measured athletes' self-efficacy, and notational analysis evaluated the efficacy of volleyball performance. The results showed strong or very strong self-efficacy in the game, defensive self-efficacy, offensive self-efficacy, and global self-efficacy, as well as relationships between defensive self-efficacy and defensive efficacy, and between offensive self-efficacy and offensive efficacy. The high-performance athletes across both variables investigated were partially susceptible to circumstantial issues inherent to the sport context, such as matches inside or outside home, with public for or against, with teams of different technical levels, with teams that have a history of confrontations with more wins or more defeats against their team.

KEYWORDS

Athletes; Sport; Evaluation; Performance

1. INTRODUCTION

Volleyball is a sport that is constantly being updated, especially in terms of rules, game structure and versatility of athletes to compete effectively in high performance. With the evolution of

the sport, the search for resources that promote competitive excellence has also grown, encompassing covers several spheres within the sporting environment (Matias & Greco, 2011; Morillo-Baro et al., 2018).

The need to understand how psychological factors interfere with sports performance and success comes, therefore, to meet an important demand of high performance, since the evolution of the techniques of physical preparation, technique and tactics has not been enough to guarantee the success expected (Becker Junior & Samulski, 2002).

What stands out in high-performance sport is the need for athletes to maintain mental control during matches in the face of the diversity of emotional reactions involved in the playing environment (Feltz & Lirgg, 2001; 2012; Moritz et al., 2000). The arguments in this respect are based on the fact that variations in athletes' performance that occur during games, and therefore over a short period of time, may be linked to cognitive fluctuations during practice and – in particular – to mental control of the athlete, influencing the balance and stability of his/her performance (Stefanello, 2007).

In this context, the self-efficacy, understood as the athlete's belief in his/her ability to take courses of action necessary to achieve certain goals (Bandura, 1997), has been considered one of the psychological factors relevant to maintain mental control and a good performance athletic.

The evaluation of self-efficacy favors interventions to promote, restore, and/or maintain this psychological competence in the course of a competition (Bandura, 1990). It allows you to identify the regulation of athletes' thinking patterns and how they will behave in order to achieve their goals in the face of adversity. Significant positive relationships between self-efficacy and sports performance were evidenced in athletes of golf (Irazusta & Arruza, 2006; Rodríguez et al., 2015), football (García Naveira, 2018; Leo Marcos et al., 2008, 2011), and basketball (Ortega et al., 2009; Ortega et al., 2007).

On the other hand, in three meta-analyzes (Guttman, 1944; Stajkovic & Lee, 2001; Bandura, 2012), negative effects of self-efficacy and positive effect sizes were found, moderate to high, regardless of whether self-efficacy was altered by experience, modeling, or verbal persuasion.

In volleyball, the self-efficacy in the serve and performance of this fundament improved at the end of a program of mental abilities (Shoenfelt & Griffith, 2008). Self-efficacy, self-regulation, and efficacy of the execution of the serve varied in in relation to places of the court and in all levels of the athletes' performance (Kitsantas & Zimmerman, 2002). However, the instruments used in these

studies were not elaborated and/or validated for this sport and no references found about the psychometric properties of these instruments, which is an important limitation.

Bandura (2012) pointed out that many sources of disagreement between efficacy beliefs and action focus on the evaluation of self-efficacy, highlighting failures of self-efficacy, deconstruction of self-efficacy as a comprehensive trait unconditionally manifested, mismatch between assessed self-efficacy and mastery of activity, temporal disparities between self-efficacy beliefs evaluated and performance under certain conditions, and failure to distinguish between self-efficacy during acquisition phases and performance of acquired skills.

The moments of evaluation become, therefore, of great relevance for understanding the relation between self-efficacy and performance. Bandura (1997) suggested that the evaluation of self-efficacy was not only in moments that precede certain activities, but also in the post-activity period (Bandura, 2012), which was not observed in the studies contemplated in systematic reviews (Machado et al., 2014, 2019).

In addition, no studies were found with athletes from the Brazilian Volleyball *Superliga*, one of the most important national championships in the world scenario, with the participation of Olympic champions, world champions, foreign athletes and high level coaches (Confederação Brasileira de Voleibol, 2018). Participants with such characteristics can make important contributions of remaining gaps about the predictive effect of self-efficacy on the performance of high-level athletes.

Thus, the aim of the current study is to analyze the relationship between volleyball self-efficacy and the efficacy of athletes of high-performance volleyball teams, at different times of the 2017/2018 Brazilian Superliga Men's and Women's Volleyball season and also examine the differences between self-efficacy in three moments on the competition.

2. METHODS

2.1. Study Design

The present study aimed to measure the self-efficacy in high-performance volleyball athletes, of both genders, being characterized as a field study, of the correlational descriptive type, with the intention of presenting information about individuals in an organized way (Nelson & Thomas, 2012)**.** In addition, it is characterized as a notational analysis of sports performance in order to identify

critical situations that point to performance indicators (Nevill et al., 2002) through movement analysis, technical and tactical evaluation and statistical compilation (Hughes & James, 2008)**.**

2.2. Participants

Sixty-five athletes from four teams competing in the 2017/2018 Men's and Women's *Superliga* participated in the study, according to the following criteria: (1) club agreement; (2) Club confrontation at the beginning of the competition (shift) and mid-competition (return). The 2017/2018 season included 12 Men's teams and 12 Women's *Superliga* teams. The study excluded: (1) athletes who were injured; (2) athletes unrelated to the match or who have not traveled with the team for the matches assessed. Due to the fact that in matches away from home the teams do not travel with their full squad (only 14 athletes are listed for the match, two more athletes than was allowed in previous seasons), in the game collections which the gym command was from the opponent, collections were not made with the athletes who did not travel, convenient with the circumstances of these athletes not being related to the matches and the particularity of the competition system.

To this end, the teams' track record in terms of financial investment was taken into account (two clubs with the highest investment - one male and one female - and two other clubs with the lowest investment - one male and one female for the 2017/2018 season) and the final classification in the previous season (two clubs with final classification in the competition between the top four - one male and one female and two other clubs with final classification in the competition between the last four placed - a male and a female). It is worth mentioning that among the 4 teams selected for the investigation, there were some athletes with passages in Brazilian National Teams, both from base and adult categories. The athletes participating in the research competed for teams from the Brazilian states of Rio de Janeiro, São Paulo and Paraná, belonging to the South and Southeastern regions of Brazil.

The athletes' schooling time was calculated by ranking in years of study, for the 65 athletes that correspond to the total number of athletes from the four teams investigated (Elementary School 8 years old), High School 11 years, Incomplete Higher Education 13 years, Complete Higher Education 15 years and Specialization 16 years of study). In addition, the percentage of schooling of all athletes was calculated in percentage terms: with Elementary School (1.53%), with High School (52.30%), with Incomplete Higher Education (29.23%), with Complete Higher Education (15.34 %) and with specialization (1.53%). Table 1 shows the characteristics of the teams investigated.

Table 1. Characteristics of the teams and players participating in the study

Teams / Classification in Competition	n	Age (years)	Practice time (years)	Time on staff (months)	Scholarship (years)	Games (Total / Winners)
Men's Team A (10th Place)	18	25.00 ± 3.86	9.63 ± 4.22	17.00 ± 14.17	11.71 ± 0.99	22/ 05
Men's Team B (7th Place)	15	27.80 ± 7.89	14.58 ± 7.75	18.67 ± 20.90	13.08 ± 1.62	24/ 10
Women's Team C (2nd Place)	15	28.00 ± 5.14	15.85 ± 4.06	33.42 ± 47.29	12.00 ± 1.81	30/ 27
Women's Team D (12th Place)	17	24.00 ± 4.28	10.13 ± 4.49	11.64 ± 10.90	12.06 ± 1.60	22/ 01
Total	65	26.20 ± 1.73	12.54 ± 2.71	20.18 ± 8.07	12.21 ± 0.51	

2.3. Procedures

The study was approved by the Research Ethics Committee of the Health Sciences Sector/SCS, Federal University of Paraná (CAAE: 51694315.0.0000.0102, opinion: 1,574,185), authorized by the Brazilian Volleyball Confederation (CBV) and sports clubs. The informed consent form was signed by all athletes who agreed to participate in the research.

Data collection was carried out by the first author of the study the day before the matches, before or after the training, in the gyms and/or hotels where the athletes were staying, in three intervals: (a) before the start of the competition; (b) before the start of the second stage of competition and (c) after the last game of team in competition.

Both in men and women, as the *Superliga* format includes round-trip games (turn and return) after the return, the play-offs, quarterfinals begin. The top 8 teams ranked in the table move to this stage. The crossings of 1 x 8, 2 x 7, 3 x 6, 4 x 5 between the placed ones begin. This stage is played in a series of best of three matches. The semifinal stage is held in best of five games. This season, the format of the final was modified, being played in best of two games, with each finalist having the command of one game. The second, decisive match, was commanded by the best placed finalist in the qualifying phase. In case each finalist wins a duel, the tiebreaker was made in the golden set, in

which the winner got the champion trophy, regardless of the scores of the two games (Confederação Brasileira de Voleibol, 2018).

For a better understanding of the results and discussion, the evaluation moments of each team (game at home and game away from home) were: Team A: first game at home, second game away from home, third and last game at home; Team B: first game away from home, second game at home and third game at home; Team C: first game away from home, second game at home and third and last game away from home; Team D: first game at home, second game away from home and third and last game at home.

2.4. Measurements

Volleyball Self-Efficacy Scale (VSES). Developed and validated for high-performance Brazilian athletes (Machado, 2018) evaluates the strength of self-efficacy (efficacy expectations) on a scale of 0 to 100 points, with unit intervals of 10, where 0 (zero) corresponds to '*None*' (does not believe in his/her ability); 50% '*Moderately*' (moderate degree of belief in their ability); and 100% '*Completely*' (completely convinced in his or her capacity for fulfillment). The VSES has 19 items, distributed in three dimensions: (1) Self-Efficacy in the Game (SEG); (2) Defensive Self-Efficacy in Volleyball (DSEV); and (3) Offensive Self-Efficacy in Volleyball (OSEV). Twelve items refer to *SEG* (e.g. "Have patience to deal with different moments of the game"). Four items refer to *DSEV* (e.g. "Be able to guide your team and command the court fund") and three items refer to *OSEV* (e.g. "Define a difficult point"). The VSES allows deriving an average score for each dimension (*SEG*, *DSEV* and *OSEV*) and a total score (Global Self-Efficacy in Volleyball - GSEV). The dimension *OSEV* was excluded from the instrument, when applied to the libero player, using in this case the average of the dimensions *SEG* and *DSEV* to calculate the *GSEV*. The VSES factorial structure showed good psychometric properties ($\chi2 = 447.78$, gl = 148, S-B$\chi2 = 354.20$, $p < .05$, RMSEA = .07, NNFI = .91, CFI = .92. The coefficients of α, Ωt and CR for each dimension ranged from .87 to .94. The indicators of the average extracted variance (AVE) ranged from .57 to .71 and the chi-square differences ($\chi2 = 23.55$, df = 16; p = .10) indicated the factorial invariance for the sexes ($p < .001$).

Efficacy of team performance. We used the notational analysis (Technical Report of Game) provided by the performance analysts of the clubs investigated. The data from the volleyball data were used because the investigated clubs used this performance analysis instrument in their daily lives, which makes the athletes already familiarized with the results of their performance from the

analysis derived from this instrument, as (Oliveira et al., 2018) points out the importance of using performance indicators for high performance sport. The valuation criteria were harmonized because three teams used the software 'Data Volley' 2007 and a team used software developed by the technical team itself. In the analysis of the effectiveness, through Data Volley software, the values obtained in the Match Report were used, which presented the values of the efficacy about the actions of the athletes in the grounds of withdrawal, reception, attack, and blocking. The Match Report presents the effectiveness of the fundamentals through formulas pre-established in the programme that generate the effectiveness values of the respective fundamentals (Figure 1).

$$\text{Formula} = \left(\frac{\begin{array}{l} Actions = * Value =) + (Actions\ / * Value\ /) \\ Actions - * Value -) + (Actions\ ! * Value !) + \\ Actions + * Value +) + (Actions\ \# * Value\ \#) \end{array}}{\text{Total of Actions}} \right) * \text{Factor}$$

Figure 1. Formula for calculating efficacy (Source: SPSS Manual ('Data Volley', 2007).

Legend: Actions #: actions that were successfully performed; Actions +: actions of good quality and that give greater opportunity of point to the analyzed team; Actions: actions in serve-pass ratio;! Actions -: negative / inefficient actions. Actions /: actions that favor the point definition for the opponent (except serve) or give direct point; Actions =: wrong action that generates point for the opponent.

In order to calculate the efficacy, the fundamentals were divided into offensive (serve + attack) and defensive (pass + block). The *DSEV* dimensions were correlated with the defensive fundamentals, *OSEV* with offensive fundamentals and *VSES* with total Efficacy in the game (serve + attack + pass + block).

However, the analyzes carried out by the performance analysts of teams themselves are based on the argument that the athlete's perception of performance has an influence on the way in which the performance evaluation is performed by his team and how this evaluation is passed to the athlete by the training team.

2.5. Statistical Analysis

The data were analyzed using the SPSS software (Statistical Package for the Social Sciences, Version 22). Data normality was tested using the Shapiro-Wilk test (Shapiro & Wilk, 1965) was used. Nonparametric statistics were used for data that did not demonstrate normal distribution. The ANOVA one way (Vieira, 2006) of repeated measures was performed to evidence possible differences in the three moments of self-efficacy evaluation in athletes' volleyball. The Friendman test was used for nonparametric data only to team B.

Student's t-test was used to verify differences between the moments of application of the scale (first moment, second moment or third moment) in the case of athletes who had only two evaluate Spearman's correlation between ESRB and performance effectiveness was performed to identify possible relationships when the athlete had only two assessment moments (Bussab & Morettin, 2013). For analyzes that contemplated the performance, only the athletes that participated in the matches were contemplated. The significance level adopted for all analysis were $p < .05$

3. RESULTS

The average values of Volleyball Self-Efficacy Scale (VSES) in the three moments of evaluation (Table 2), revealed that the athletes of the four teams investigated presented strong or very strong Self-Efficacy in the Game (*SEG)*, Defensive Self-Efficacy in Volleyball (*DSEV)*, Offensive Self-Efficacy in Volleyball (*OSEV)* and Global Self-Efficacy in Volleyball (*GSEV)*.

Table 2. Mean values of VSES of the teams in the three intervals of the competition

Self-efficacy	**Team A (n=18)**			**Team B (n=15)**			**Team C (n=15)**			**Team D (n=17)**		
	1	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
SEG	90.89	85.32	85.16	82.85	80.00	74.29	81.86	84.17	85.00	80.61	82.98	81.83
DSEV	83.28	75.58	80.56	77.71	77.83	74.64	75.58	80.00	79.67	74.50	81.96	82.17
OSEV	90.95	87.88	87.38	90.61	87.18	81.43	85.76	83.33	84.87	79.74	77.78	74.10
GSEV	89.36	83.75	84.38	82.97	80.78	75.49	80.94	83.28	83.73	79.36	82.33	81.14

Significant differences p <.05. Legend: 1 = before the first game of the turn; 2 = before the first game of return; 3 = after the last game of the competition. SEG = Self-Efficacy in the Game; DSEV = Defensive Self-Efficacy in Volleyball; OSEV = Offensive Self-Efficacy in Volleyball; GSEV = Global Self-Efficacy in Volleyball.

There were no significant differences between the three assessment moments for *GSEV, SEG*, *DSEV* and *OSEV*. However, there was an upward trend in athletes' *GSEV* in debut matches (start of season for men's teams and start of return for women's teams), with the same opponents. In the dimensions of self-efficacy, there was greater stability between the intervals evaluated for male team, repeating the pattern observed for global self-efficacy (in debut games in the shift). In women's teams, the highest averages were found were sometimes found on the turn, return and after the last game. A detailed analysis of volleyball self-efficacy for athletes who participated in only two assessment intervals revealed differences associated with the time of the athletes' debut in the competition, regardless of whether the games are played at home or away from home.

The performance values (*Defensive, Offensive, and General Efficacy*) did not present statistically significant differences in the three intervals investigated (Table 3). The one-way ANOVA (teams A, C e D) test also did not identify statistically significant differences in efficacy comparisons between the teams. However, for team B the Friedman test showed significant differences.

Table 3. Values of efficacy in the volleyball of the teams in the three intervals of evaluation of the competition

Efficacy	**Team A (n=18)**			**Team B (n=15)**			**Team C (n=15)**			**Team D (n=17)**		
	1	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
DE	49	38	42	32	41	47	35	28	62	27	48	27
OE	45	33	35	47	46	55	41	44	40	25	51	25
GE	94	71	77	79	87	102	76	72	102	52	99	52

** Significant differences p <.05. Legend: DE = Defensive Efficacy; OE = Offensive Efficacy; GE = General Efficacy; 1 = before the first game of the turn; 2 = before the first game of return; 3 = after the last game of the competition.*

Table 4 presents the Spearman Correlation values between dimensions the *Self-efficacy in Volleyball* (*DSEV, OSEV*) and *GSEV* values and the *efficacy of the game's* actions (*defensive, offensive and* general) in the three intervals of evaluation.

Table 4. Spearman Correlation between Dimensions VSES and Efficacy in Volleyball

Self-Efficacy of Teams	Interval 1						Interval 2						Interval 3					
	DE		OE		GE		DE		OE		GE		DE		OE		GE	
	rs	p	rs	p	rs	p	rs	P	rs	p	rs	p	rs	p	rs	p	rs	p
Team A																		
DSEV	.12	.63					.40	.16					.48	.05*				
OSEV			.31	.26					.36	.26					.20	.48		
GSEV					-.13	.61					.22	.46					-.00	.97
Team B																		
DSEV	.15	.58					-.13	.62					-.10	.70				
OSEV			.07	.82					-.16	.59					-.25	.58		
GSEV					.02	.93					-.02	.92					-.33	.46
Team C																		
DSEV	.51	.05*					-.06	.83					.14	.60				
OSEV			.36	.27					-.01	.96					.09	.76		
GSEV					.60	.02*					-.18	.05*					.25	.35
Team D																		
DSEV	.36	.16					.37	.15					.25	.33				
OSEV			.50	.09					.49	.09					.58	.03*		
GSEV					.27	.35					.29	.31					.41	.13

** Significant differences p <.05 Legend: SEG = Self-Efficacy in the Game; DSEV = Defensive Self-Efficacy in Volleyball; OSEV = Offensive Self-Efficacy in Volleyball; GSEV = Global Self-Efficacy in Volleyball.*

There was moderate correlation between *DSEV and DE* in the first (Team C) and in the third (Team A) interval of evaluation and between *GSEV* and *GE* in the first interval of evaluation. Moderate correlation was observed between *OSEV* and *OE* third interval of evaluation (Team D).

Table 5 presents the values of the Spearman Correlation between *DSEV, OSEV and GSEV* and the *efficacy of offensive actions*, defensive actions and general actions of all season for the four teams. There was moderate correlation between *DSEV* and the *efficacy of the defensive actions* of the entire season for Team D.

Table 5. Spearman Correlation between the General Values During the Season of the Dimensions of VSES with the Efficacy of the Actions in Volleyball.

Self-Efficacy of Teams	General Defensive Efficacy in Season		General Offensive Efficacy in Season		General Efficacy in Season	
	rs	P	rs	p	rs	P
Team A						
DSEV	.35	.19				
OSEV			.11	.72		
GSEV					-.03	.88
Team B						
DSEV	-.57	.18				
OSEV			-.11	.81		
GSEV					-.12	.78
Team C						
DSEV	.21	.43				
OSEV			.09	.75		
GSEV					.34	.21
Team D						
DSEV	.47	.05*				
OSEV			.50	.07		

GSEV	.37	.17

** Significant differences p < .05 SEG = Self-Efficacy in the Game; DSEV = Defensive Self-Efficacy in Volleyball; OSEV = Offensive Self-Efficacy in Volleyball; GSEV = Global Self-Efficacy in Volleyball.*

4. DISCUSSION

In the relationship between self-efficacy and performance (efficacy), there was moderate correlation for three teams. In Team A, there was correlation between Defensive Self-Efficacy in Volleyball (*DSEV) and Defensive Efficacy (DE)* after the last game of the competition. For Team C, there was a correlation between *DSEV and DE*, between Global Self-Efficacy in Volleyball (*GSEV) and GE* at the competition debut. For Team D, there was correlation between Offensive Self-Efficacy in Volleyball (*OSEV) and OE*.

Although the results found in the present study do not allow to affirm that a greater self-efficacy reflects in a better performance of the athletes, the significant correlations found at different moments of the competition for three of four studied teams (Teams A, C and D), reinforces the statement of Bandura (2012) on the need to assess self-efficacy in different facets within a domain of activity. However, this assumption, contemplated in the present study with the inclusion of assessment of self-efficacy in the post-activity period in addition to the moments that precede activities, has been little observed in studies with athletes, which limits the discussion of findings of this study with other research. In addition, most studies found in systematic reviews by Machado et al. (2014, 2019) presented instruments that do not have validation (Blecharz et al., 2014; Gilson et al., 2012; Gomes et al., 2012; Lox, 1992; Zetou et al., 2012) or whose validation process has important limitations (Guicciardi et al., 2016), that make it difficult to compare with the results found in the present study.

Another relevant factor that makes it difficult to discuss the results with other findings is related to the Likert-type response scale used in the previously mentioned studies. Bandura (2012) emphasizes that Likert-type scales are appropriate to assess phenomena that have positive and negative valences, such as attitudes, opinions, likes / dislikes, but not for self-efficacy, because the judgment of total disability (0) has no minor gradation negative. One cannot be less than completely ineffective. Even so, in studies conducted on self-efficacy, instruments with Likert-type response scales (Argudo-Iturriaga et al., 2020) continue to be found, which compromises the proper analysis of this construct and limits the comparison of results with the findings of the present study. Self-efficacy scales are unipolar, ranging from zero to a maximum belief force. Therefore, bipolar self-

efficacy scales with negative gradations below zero point do not make sense. In the discontinuous bipolar scale score, the authors convert positive and negative segments partially ordered breakers with intermediate neutrals (neither agree nor disagree) as if they were a completely ordered unipolar graduation. It makes no sense to say that you have a neutral level of self-efficacy. When ratings on a bipolar scale are converted to a unipolar ordinal scale, the meaning of the neutral midpoint is reconstructed as a moderate level of self-efficacy. Unfortunately, Likert-type bipolar scales are beginning to appear as measures of self-efficacy, with distorted meaning (Bandura, 2012).

In addition, there is little presence of publications by South American authors in English-speaking journals of sport psychology, as highlighted by Papaioannou et al. (2013). Which demonstrates the need for contributions from these researchers to better understand the specific characteristics of the context of sport psychology practices in specific locations in the country as well as the expansion of well-developed theories and methods (Papaioannou et al., 2019). Thus, comparing the data obtained in the present study with other research should be done with caution.

The correlation found for *DSEV* and *DE* (Time A) and *OSEV* and *OE* (Team D) after the last game of the season seems to reflect the impact of the team's retrospective over the season on the perceived efficacy of athletes. Both teams played 22 matches in the competition. The Team A winning five games and Team D won one match. Historically, this was the second season of Team A in the Superliga (which has existed for 24 years), having had a modest financial investment and having happened to change the host city (last season was in last place) (Confederação Brasileira de Voleibol, 2018). Thus, the retrospective analysis of the team regarding their self-efficacy may correspond to the perception of a positive result on the part of the athletes in relation to the previous season. Team D was never champion in a season of Superliga, having been its main result the vice-championship in season 2011/2012 (Confederação Brasileira de Voleibol, 2018). These results suggest a resilient self-efficacy (Bandura, 2012), in both teams, in that it requires experience in overcoming obstacles through a persevering effort, being constructed from learning to manage failures, so that be informative and not demoralizing. Such findings seem to reinforce, even partially, the assumption that self-efficacy can predict performance when people are familiar with the task (Bandura, 1986).

Sklett et al. (2018) also found a moderate correlation between self-efficacy and performance in the post-activity period of ski jumping. Both in the overall ranking of the World Cup and in the results of the first of three individual ski competitions, self-efficacy explained approximately 14% of the variation in the World Cup in general. According to the authors, this psychological factor could

have a significant importance in relation to the performance of elite ski jumps over the entire season. What was explained based on one of Bandura's four sources of self-efficacy Bandura (1997). More precisely, that ski athletes' self-efficacy throughout the season can converge with past performance achievements. This means that any performances prior to data collection were creating future self-efficacy for the next competition and it appears to have lasted more or less for the rest of the season. Thus, as the results found in the present study with high-performance volleyball athletes suggest, it can be assumed that past performance achievements (or lack of) affect future self-efficacy and future athletic achievements, and vice versa.

Moderate correlations between *DSEV and DE* and between *GSEV and GE)*, in the first interval of evaluation (debut in the competition) found for Team C, can be attributed to the technical quality of the athletes in the effectiveness of the game actions, such as the number of team wins in the competition (increasing the amount of positive actions in the notational analysis of sports performance). It is plausible to expect that a team presenting with higher technical, tactical, physical, and psychological quality differs substantially in relation to teams with lower degrees in these variables. Team C had the highest of *GSEV* with *Performance Efficacy*, with 30 games in the competition and only three losses, being runner-up. Historically, the coach and other members of technical team participated in 21 Superliga seasons, being the most winning technical team in the competition (17 finals with 12 titles). The main sponsor of the team has been in place for 20 years in the team (which has strengthened and provided continuity to the project, besides maintaining strong financial resources for so many great achievements of the team) (Confederação Brasileira de Voleibol, 2018).

The domain experiences are the most influential source of self-efficacy (Bandura, 1997), with a reciprocal relationship between the beliefs of self-efficacy and the performance. When performance feedback is provided in a way that gives athletes a real sense of progress, they become better equipped to monitor their progress over time and make judgements about their efficacy more accurately (Beattie et al., 2015). Stronger relationships between self-efficacy and subsequent performance arise as a consequence of more detailed feedback on their past performance. Reinforcing these arguments, when conducting three experiments in order to explore the moderating role of performance feedback in the relationship between self-efficacy and performance, Beattie et al. (2015) confirmed that when minimal performance feedback was provided to participants, their self-efficacy was negatively related to subsequent performance, while for more detailed feedback, self-efficacy was positively related to subsequent performance.

Another important analysis carried out in the present study, which reinforces these arguments, indicated that the teams evaluated, regardless of the result in the competition (win/defeat) presented strong and/or very strong *SEG*, *OSEV* and *GSEV*, although no significant differences, in the three intervals (turn, return, after the last game in the competition) throughout the season. These results may be related to the fact that athletes who compete in high-performance teams, especially in volleyball, one of the most dynamic and volatile sports today, must train and constantly adapt to new realities very quickly and effectively, such that previous experiences and performances become one of the main sources for maintaining strong/very strong self-efficacy in the modality. Gilson et al. (2012) explored the relationship between self-efficacy and highly qualified athletes, from different modalities (football, volleyball, men's soccer, basketball), throughout a training cycle. The results confirmed that self-efficacy was positively related to the effort of athletes in strength training sessions, at the levels of intra and interpersonal analysis. For the authors, the results of this study showed that positive changes in self-efficacy resulted in increased performance or more adaptive behaviors.

One aspect worth mentioning is that the average experience time of the four teams in the modality was approximately 12 years, from the basic categories to competing in high performance. The years of experience in the modality and the high technical level of the investigated athletes, including constant calls from some athletes to join national selections (whether basic or main), help in the constitution and consolidation of self-efficacy. The fact that they maintain strong or very strong self-efficacy throughout the season, even presenting different levels of performance in the competition, seems to be a peculiarity of these high-performance athletes.

The detailed analysis of the self-efficacy data of the teams, although they did not present significant differences, revealed high averages for athletes of the men's teams in the debut game (turn) in *GSEV* and in its dimensions, while in the female teams, the highest averages were for *GSEV*, in the opening game in return. These findings seem to indicate the athletes' enthusiasm of both sexes over the start of the season (shift) and/or the beginning of a new phase of the competition (return), representing the expectations of self-efficacy of the participants that, according Bandura (1997), are related to the belief of individuals in their capacity to perform actions.

The results found in the present study demonstrated that self-efficacy was partially predictor of performance for Team A (*DSEV and DE*) and for Team D (*OSEV and OE*) in the third evaluation interval, and for Team C (*DSEV and DE*) in first interval of evaluation, suggesting that at different points of the competition, both variables (self-efficacy and efficacy) can be susceptible to

circumstantial issues inherent in the sport context. In a study that aimed to verify the self-efficacy of elite volleyball players in Brazil, considering the gender, age and practice time of the participants, the results showed evidence that the age and time of sports practice do not always increase the athletes' self-efficacy. As much as these variables are strongly influencing factors, the belief in efficacy may be related to the perception of the context, the opponent, the moment and circumstances in which the athlete is involved, as suggested in the present study (Machado et al., 2021). Blecharz et al. (2014) suggest that self-efficacy beliefs take on the role of protecting athletes from possible negative effects, when environmental factors cannot be used to guarantee positive results. Athletes are at risk of perceiving a negative task climate if they have low general self-efficacy or low self-efficacy with a personal barrier. Therefore, it may be reasonable to assume that psychological factors, such as self-efficacy, can interact with each other for optimal performance.

In particular, the *GSEV* varied from strong to very strong for the athletes of the four high-performance teams and did not differ significantly across the three intervals of evaluation, which evidences a standard of judgement of the athletes about their ability to perform actions in high-performance situations.

5. LIMITATIONS

Some limitations of the study are highlighted, such as the way the athletes were selected, using non-probabilistic methods from the available teams, as well as the notational analysis in the evaluation of the efficacy of the players' actions performed by the teams' own performance analysts, which made it impossible the evaluation of intra-rater and inter-rater reliability.

6. CONCLUSIONS

In conclusion, although the results of present study show moderate correlation between some dimensions of self-efficacy assessed, they do not support the argument of the relationship between self-efficacy and efficacy in the game for volleyball players in general. It is suggested the need to continue the kind of analyses performed in this study in order to better understand the findings in this investigation. In addition, future studies may include high-yield beach volleyball athletes, as well as athletes from other countries/languages, in order to make possible comparison of those findings with the data obtained in the present study.

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AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

FUNDING

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) - Finance Code 001".

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