THE MATCH DIFFICULTY MODULATES COPING ESTRATEGIES BUT NOT COMPETITIVE ANXIETY IN MALE VOLLEYBALL ATHLETES DURING TOURNAMENT WITH CONGESTED SCHEDULE

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Abstract

This study analyzed competitive anxiety and coping during competition with a congested schedule in male volleyball athletes according to match difficulty (MD). Eleven athletes had their competitive and coping anxiety levels analyzed before four matches, using the Competitive State Anxiety Inventory - 2 Revised (CSAI-2R) and Athletic Coping Skills Inventory-28 (ACSI-28), respectively. The MD level was calculated at the end of the competition. Anxiety levels did not change during matches. The ACSI-28 "free from worry" subscale score for match 1 was different from matches 2 and 4. The highest MD level match showed different score for the ACSI-28 "coping with adversity" subscale compared to the match with the lowest MD level. During the competition with a busy schedule, the analyzed athletes modulated their coping strategies according to their MD level.

Keywords: Volleyball. Athletic Performance. Psychology. Competitive Anxiety

EL NIVEL DE DIFICULTAD DEL JUEGO MODULA LAS ESTRATEGIAS DE AFRONTAMIENTO, PERO NO LA ANSIEDAD COMPETITIVA EN LOS ATLETAS MASCULINOS DE VOLEIBOL DURANTE UN TORNEO CON CALENDÁRIO CONGESTIONADO

Resumen

Este estudio analizó la ansiedad competitiva y el afrontamiento durante los torneos con calendario congestionado en atletas masculinos de voleibol según la dificultad del juego (DJ). El Inventario de Ansiedad Competitiva del Estado - 2 Revisado (CSAI-2R) y el Inventario de Habilidades de Afrontamiento Atlético-28 (ACSI-28) se utilizaron para analizar la ansiedad competitiva y el afrontamiento, respectivamente, en once atletas. El nivel de DJ se calculó al final del torneo. Los niveles de ansiedad no cambiaron durante los partidos. La puntuación de la subescala ACSI-28 "sin preocupaciones" para el juego 1 fue diferente de la de los juegos 2 y 4. El juego con el nivel de DJ más alto mostró una puntuación diferente para la subescala ACSI-28 "confrontación con la adversidad" en comparación con el juego de DJ de nivel más bajo. Durante un torneo con calendário congestionado, los atletas modulaban sus estrategias de afrontamiento de acuerdo con el nivel de DJ.

Palabras clave: Voleibol. Rendimiento atlético. Psicología. Ansiedad competitiva

O NÍVEL DE DIFICULDADE DA PARTIDA MODULA AS ESTRATÉGIAS DE COPING, MAS NÃO A ANSIEDADE COMPETITIVA EM ATLETAS MASCULINOS DE VOLEIBOL DURANTE COMPETIÇÃO COM CALENDÁRIO CONGESTIONADO

Resumo

Este estudo analisou a ansiedade competitiva e o coping durante competição com calndário congestionado em atletas de voleibol masculino de acordo com à dificuldade do jogo (DJ). Onze atletas tiveram seus níveis de ansiedade competitiva e coping analisados antes de quatro partidas, usando os questionários Competitive State Anxiety Inventory - 2 Revised (CSAI-2R) e Athletic Coping Skills Inventory-28 (ACSI-28), respectivamente. O nível do DJ foi calculado no final da competição. Os níveis de ansiedade não mudaram durante as partidas. O escore da subescala "livre de preocupação" do ACSI-28 para o jogo 1 foi diferentes dos jogos 2 e 4. O jogo com nível de DJ mais alto mostrou escore diferente para a subescala "enfrentando adversidade" do ACSI-28 em comparação com o jogo com nível de DJ mais baixo. Durante a competição com calendário congestionado, os atletas analisados modularam as estratégias de coping de acordo com o nível de DJ.

Palavras clave: Voleibol. Desempenho atlético. Psicologia. Ansiedade Competitiva

INTRODUCION

Volleyball is a sport of intermittent nature, which requires high-intensity movements from athletes interspersed with recovery periods, in addition to performing actions with high levels of precision so that the chances of victory during competitions are increased (Sheppard, Nolan, & Newton, 2012; Silva, Lacerda, & João, 2014). Like any sport, it has characteristics inherent to competitive sport, such as the constant search for victories on the part of athletes and coaches, a high load of training and competitions, and the demand for performance optimization, which act as important stressors, compromising aspects of performance sporting, (Silva, Vidual et al., 2014; Fletcher, & Arnold, 2016; Kurimay, Pope-Rhodius, & Kondric, 2017). In this context, athletes' emotional balance is a fundamental aspect to achieve better results (Weinberg, & Gold, 2017).

During the competition, the stressful environment's emergence may be related to the match's importance. It has been found that salivary cortisol, a stress-related hormone, was increased before the final match in volleyball athletes compared to the average for the entire season (Moreira et al., 2013). This importance may reflect the match difficulty, which can calculate according to the system proposed by Kelly and Coutts (2007), which takes into account the level of opposition, match location, and training days between matches. This calculation was proposed for technical commissions to make adjustments to teams' training schedules during competitions; for example, training preceding matches classified as difficult must have light loads (Kelly, & Coutts, 2007). In this way, Even if the competition has a congested schedule, considering the MD can minimize the stress during the matches since the teams train on the same days of the games (Timóteo et al., 2017).

Stress can be manifested in the form of anxiety, which corresponds to an emotional situation in which there is greater sensitivity to perceive threat or danger, which can be expressed in the form of fear, tension, or apprehension and is closely associated with the activation of the autonomic nervous system (Craft, Magyar, Becker, & Feltz, 2003; Weinberg, & Gold, 2017). In the competitive environment, anxiety is a multidimensional construct subdivided into three components: Somatic anxiety, characterized by physiological changes through competition, such as excessive sweating, excessive appetite, digestive problems, facial pallor, tachycardia, respiratory changes, and muscle tension (Bertuol, & Valentin, 2006); Cognitive anxiety, which is a component of thinking and manifests itself when the athlete starts to have negative thoughts at the time of the competition (Weinberg, & Gold, 2017); and self-confidence, which is the only component that tends to perform well, corresponding to a degree in which the individual believes he can face the proposed challenge/ obstacle (Cheng, Hardy, & Markland, 2009). To deal with difficult situations that arouse competitive anxiety, athletes are encouraged to use strategies to manage their emotions and circumvent obstacles (Pons, Viladrich, Ramis, & Polman, 2018).

One of the main psychological resources for coping with stressful demands in the sports context are coping strategies, which are defined as a cognitive or behavioral effort capable of undergoing constant changes to adapt and/ or manage internal and/or external demands that interfere with some way in the development of the individual (Lazarus, & Folkman, 1984). More recent approaches show that coping strategies can be divided into two orientations: coping oriented to disengagement, which corresponds to thoughts and behaviors that focus attention on stressful events; or task-oriented coping, which is characterized by efforts aimed at dealing directly with stressful situations (Pons et al., 2018). Studies point to coping as a useful tool to deal

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with widespread emotional reactions in the competitive environment, such as anxiety (Pons et al., 2018; Christensen, & Smith, 2018).

Anxiety and coping associated with sports performance are variables used in relevant investigations and have been showing significant results for the literature (Nicholls, Polman, & Levy, 2010; Doron, & Martinent, 2017; Pons et al., 2018) and, in this sense, volleyball athletes are subject to the impact of high levels of anxiety (Silva, Vidual et al., 2014). Additionally, evidence on the behavior of competitive anxiety and coping due to the match difficulty when played on consecutive days is scarce in the literature. Thus, this study's findings may provide relevant information for technical commissions to develop strategies that minimize the impact of anxiety in tournaments with a congested schedule. Competition with this format does not offer enough time to promote satisfactory interventions that minimize such an impact.

Therefore, this study's objective was to verify competitive anxiety and coping during the tournament with a congested schedule in male volleyball athletes due to the match difficulty. The initial hypothesis formulated is that athletes present higher levels of competitive anxiety before games with greater difficulties and use coping strategies more frequently.

Method

Experimental design

This cross-sectional study of repeated measures was carried out with male volleyball players during a university tournament at the national level, special division. During this period, four matches were analyzed, three through the qualifying phase and one through the semifinal phase. The results of the first to fourth matches, in sets, were 1x3, 3x2, 3x2, and 0x3, respectively, with the team finishing the tournament in fourth place. 50 minutes before each match, the athletes answered the Competitive State Anxiety Inventory - 2 Revised (CSAI-2R) and the Athletic Coping Skills Inventory-28 (ACSI-28), which correspond to the questionnaires related to anxiety and coping strategies, respectively (Figure 1). After the competition, the match difficulty was calculated. The athletes were instructed to maintain their similar sleep patterns and food during the matches played and not to use pharmacological substances such as antidepressants and derivatives.

Participants

Eleven male athletes (21.45 ± 2.58 age; 82.5 ± 10.42 kg; 186.27 ± 6.18 cm) belonging to a national-level university volleyball team participated in the study. The athletes were chosen in a non-probabilistic way and had (±) 4 years of experience with training and competitions in the modality. To be included in the study, athletes would have to participate in the analyzed matches and not use antidepressant or derivative medications. The athletes signed the informed consent form after being informed about the research procedures, which were carried out in accordance with the Declaration of Helsinki and approved by the local ethics committee.

Instruments

The match difficulty (MD) was calculated according to the system proposed by Kelly and Coutts (2007), which take into account the scores of three variables, a) "level opposition", b) "match location", whether the match is at home or away, and c) "training days between matches". As the study recommends, an adaptation of the score was made for the variables, taking into account the disputed competition conditions (Kelly, & Coutts, 2007). The "level of opposition" score was calculated according to the teams' final ranking, following the criteria: 1st and 2nd places = 8 points, 3rd and 4th places = 6 points, 5th and 6th places = 4 points, and 7th and 8th places = 2 points. As there were no training days between matches and all matches were held outside the team's city, the scores for the variables "match location" and "training days between matches" were 8. The MD was calculated by adding the scores of the three variables.

The Competitive State Anxiety Inventory (CSAI-2R) was used to assess athletes' anxiety levels. The CSAI-2R consists of 16 items, grouped into three subscales,

as follows: items 01, 04, 06, 08, and 12 belong to the cognitive anxiety factor; 02, 05, 09, 11, 13, and 15 to somatic anxiety; 03, 07, 10, 14 and 16 to self-confidence (Cox, Martens, & Russel, 2003). The statements were answered according to a Likert-type scale that ranges from (1) "never" to (4) "always". The results are obtained from the mean of each subscale. The CSAI-2R was validated for the Portuguese language and showed good internal consistency for cognitive anxiety (0.84), somatic anxiety (0.78), and self-confidence (0.80) (Fernandes, Vasconcelos-raposo, & Fernandes, 2012).

For the analysis of coping strategies, Athletic Coping Skills Inventory-28 (ACSI-28) was used. The ACSI-28 consists of 28 items, whose answers are given on a Likert scale ranging from (0) "almost never" to (3) "almost always" (Smith, Schutz, Smoll, & Ptacek, 1995). This instrument has seven subscales that assess the following psychological constructs: a) copy with adversity; b) peaking under pressure; c) goal setting / Mental Preparation; d) concentration; e) free from worry; f) Confidence / Motivation and g) coachability / Availability for learning from training. The results are obtained from the averages of the subscales. The average of all the instrument's values indicates the Confrontation Index in Sport, which, the higher the value obtained, the greater the capacity for confrontation in the situation of competition. The ACSI-28 was validated for Brazilian athletes with a variation in internal consistency between 0.34 and 0.81 (Miranda, Coimbra, Bara-Filho, Miranda-Júnior, & Andrade, 2018).

Data analysis

The assumptions of normality were analyzed using the Shapiro-Wilks test. As normalities were not verified in all analyzed variables, Friedman's nonparametric test compared the scores of the subscales of the CSAI-2R and ACSI-28 between the games. Likewise, the Friedman test was used to compare the scores of the CSAI-2R and ACSI-28 according to the match difficulty. Post-hoc test was performed by Dunnett test. Spearman's correction test was also used to relate the components of the CSAI-2R to the total score of the ACSI-28. The magnitude of the effect for the correlations was based on the following scale: <0.10 - trivial; 0.10 to 0.29 - small; 0.30 to 0.49 - moderate; 0.50 to 0.69 - large; 0.70 to 0.89 - very large and> 0.90 - almost perfect (Hopkins, Marshall, Batterham, & Hanin, 2009). All data were analyzed using the Prisma statistical package, version 5 (GraphPad Software, San Diego, CA, USA), adopting a significance level of 5%.

Results

The MD scores were 24, 20, 18, and 24 for matches 1, 2, 3, and 4, respectively. In this way, obtained three levels of MD, 1 (MD1), 2 (MD2), and 3 (MD3), with MD3 being considered more difficult. MD3 was obtained by averaging the subscales of the CSAI-2R and ACSI-28 of the matches that obtained 24 points, 1 and 4, respectively. MD1 was equivalent to match 3, and MD2 was equivalent to the results of match 2. There were no differences in levels of anxiety between the matches (p > 0.05), as well as due to the MD (p > 0.05) (Figures 2-A and 2-B). Regarding coping strategies, when comparing matches, there was a difference only for the "free from worry" subscale (p < 0.001). When compared due to the MD, there was a difference, only for the subscale "coping with adversity" (p < 0.05) (Figures 2-C and 2-D) (Figure 2).

The total score of the ACSI-28 showed a negative correlation with the cognitive component of the CSAI-2R only in the first match (r = 0.86; p = 0.033). Figure 3 reports the relationships between the subscale "self-confidence" and the total score of the ACSI-28 for the four matches played (Figure 3).

Discussion

This study aimed to verify competitive anxiety and coping strategies as a function of the MD during the tournament with a congested schedule. The findings showed that pre-competitive anxiety levels were similar before the four matches and the different matches' difficulties. However, coping showed differences for the "free from worry" subscale between matches. When coping was compared due to the MD, found differences for the subscale "coping with adversity". Therefore, these results partially confirm the hypothesis formulated. That is, athletes adopted different coping strategies to alleviate
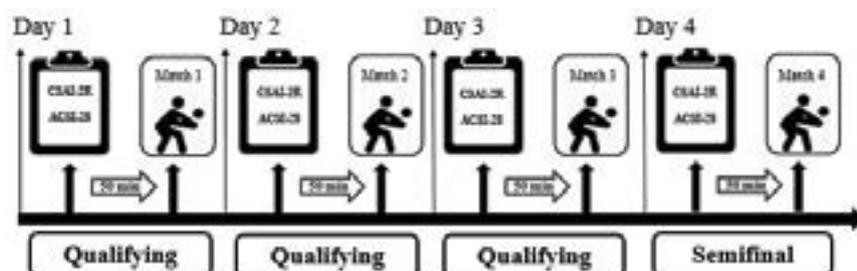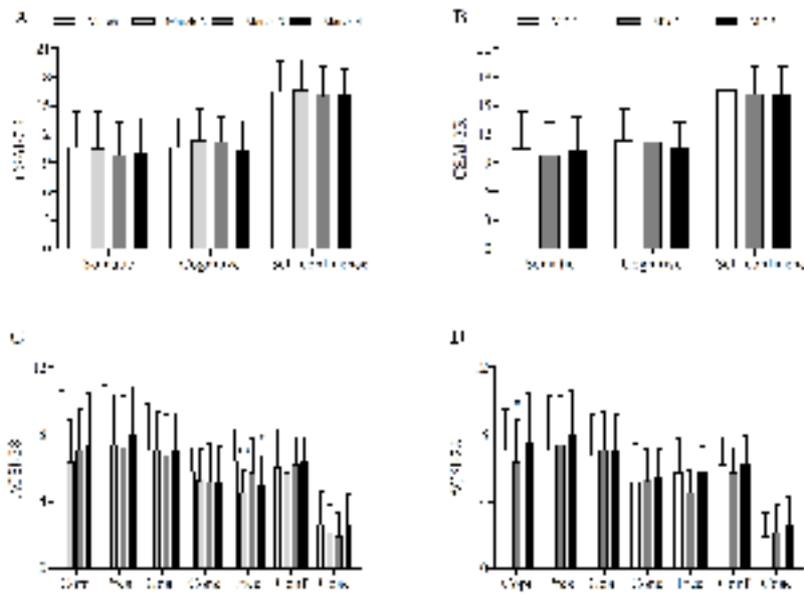

Figure 1: Experimental design.

Figure 2: A) Comparison of CSAI-2R components between matches; B) Comparison of the components of the CSAI-2R according to the match difficulty; C) Comparison of ACSI-28 subscales between matches; D) Comparison of the ACSI-28 subscales according to the match difficulty. Copi=coping with adiversity; Pres=peaking under pressure; Goal=goal setting; Conc=Concentration; Free=free from worry; Conf=Confidence; Coac=coachbility. *different from matches 2 and 4; #different from math 4; $different from MD3. **different from MD1 e MD3.
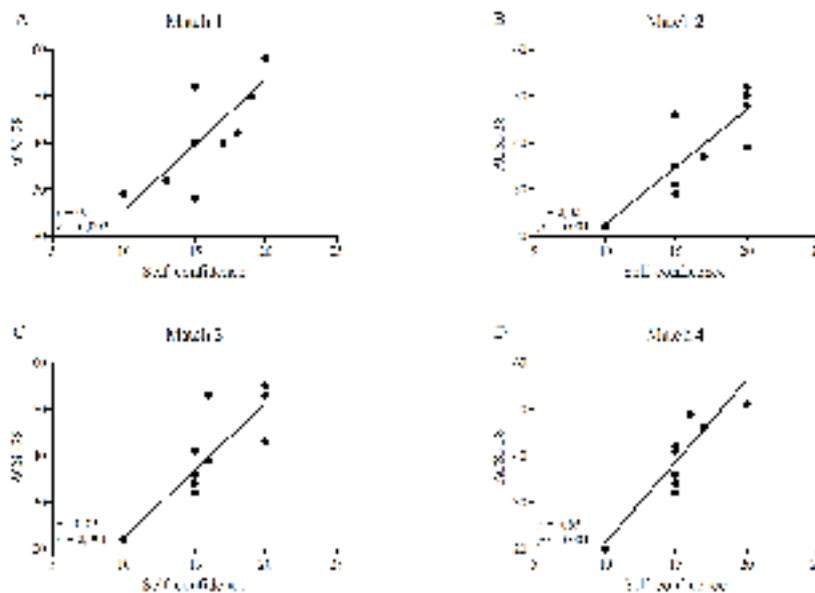

Figure 3: Relationship of the CSAI-2R's self-confidence component with the general score of ACSI-28 before match 1 (A), before match 2 (A), before match 3 (C) and before match 4 (D).

stress, according to the MD.

Studies point out that volleyball competitions with congested schedules favor the emergence of the stressful environment, negatively affecting the athletes' welfare state (Timóteo et al., 2017; Mortatti, Pinto, Lambertucci, Hirabara, & Moreira, 2018). Mortatti et al. (2018) found that elite volleyball athletes had their salivary cortisol levels increased during three matches, played on consecutive days, compared to the day before the competition started. Timóteo et al. (2017) found that volleyball athletes with lower perceived recovery levels had lower well-being levels.

The low levels of recovery during the competition, found in the study by Timóteo et al. (2017), may be associated with the involvement of athletes in the match played, as athletes tend to have more effective participation in the face of opponents considered more difficult, a fact verified in the study by Mortatti et al. (2018). Therefore, it is reasonable to think that the match's importance can contribute to the emergence of stressful environments. Moreira et al. (2013) found in volleyball athletes higher salivary cortisol levels before the final match than the average for the entire season. Therefore, the MD must be considered when possible stressors encountered during a competition are analyzed, especially when played on consecutive days.

When considering competitive anxiety as a form of stress manifestation, the present study pointed out no difference in anxiety over the matches played. Likewise, when considered the MD, the anxiety levels did not change either. This scenario was found in all subscales of the CSAI-2R. A similar situation was found with male handball athletes competing with a congested schedule over five days (Nascimento-Junior et al., 2016). On the other hand, increases in pre-competition somatic anxiety have already been found in male athletes in, triathletes, canoeing, jiu-jitsu and 10 km runners (Sanches et al., 2012; Souza et al., 2019).

The athletes' level may have interfered with the result found, as athletes of international levels tend to have higher levels of anxiety than university athletes, participants in the present study (Nicholls et al., 2010). One aspect that may have contributed to the scenario found, especially when made comparisons due to the MD, is the athletes' experience in participating in training and competitions, since they had more than four years of experience in the sport. This situation was verified in boxing athletes, in which athletes in the adult category had lower levels of somatic anxiety than athletes in

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the youth category (Alejo et al., 2020). In identifying a possibly stressful environment, athletes tend to adopt coping strategies and, in this sense, the time of experience can be a decisive contribution (Bebetsos, 2015).

Bertuol and Valentini (2006) point out that athletes' ability to manage emotions, including anxiety and activation levels, develops a factor that contributes to the success of athletes in the disputed race. In this sense, self-confidence can be a positive aspect of better performances during matches. In their study, Koruc, Arsan, Kagan & Kocaeksi (2007) found that, in male soccer athletes, the self-confidence component has a negative relationship with general anxiety. This scenario may have been repeated in the present study athletes before the disputes of the four matches, since the "general coping" presented a very large positive relationship with the "self-confidence" component of the CSAI-2R. In this sense, the coping strategies adopted possibly contributed to such findings. Nascimento-Junior et al. (2016) point out that in male handball competitions, with technically level teams played on consecutive days, self-confidence can work as a coping strategy, especially in the first match, a scenario similar to the one in this study.

Regarding coping, the "free form worry" subscale was higher in match 1 compared to matches 2 and 4. This subscale refers to the fact that athletes not putting pressure on themselves by worrying about performing poorly or making mistakes and what others think about their performance (Smith, & Christensen, 1995). The athletes in the present study, possibly, were already aware of their real technical skills, as well as their real chances in the tournament and, for this reason, participated in the matches, especially the first and the third, already aware of the possibility of meeting or not the expectations created.

The tournament model may also have favored such a scenario, where the first three matches were in the qualifying phase. The qualifying round was played in two brackets from four teams. The one that ended the qualifying round between the top two in the bracket and guaranteeing classification for the semifinal stage would ensure permanence in the next edition's special division. Hence the fact that athletes more frequently adopt coping strategies before matches 1 and 3.

Even though it is an important phase, it is possible that in match 4, semifinal, the team already had its objectives achieved, and that is why the athletes adopted coping strategies less frequently. Vidic, Martin & Oxhandler (2016) showed that the levels of the "free form worry" subscale in female athletes from the first division of North American basketball tend to fall from the beginning to the end of the season. This fact may have been repeated with the athletes in the present study, even if it was played with consecutive matches. Just look at the downward trend in the levels of the "free form worry" subscale from the third to the fourth match (Figure 2-C).

When took the MD in comparison, it observed that in MD2, the subscale "coping with adversity" was greater than MD1 (Figure 2-D). Therefore, the "coping with adversity" strategy was used with the same frequency when comparing MD2 and MD3 (equivalent to matches with greater difficulties, 1 and 4). However, the MD can modulate the frequency of coping strategies, a situation verified before the match considered with the lowest MD (match 3). The subscale "coping with adversity" is related to the focus on work and attempts to solve problems on the part of the athletes (Vieira, Carruzo, Aizava, & Rigoni, 2013) and, according to Coimbra, Bara-filho, Andrade & Miranda (2013), is the strategy most frequently used by Brazilian male athletes in team sports.

According to the literature, the subscale "coping with adversity" is related to resilience in beach volleyball athletes and ice hockey athletes' self-esteem (Belem et al., 2014, Kaplánová, 2019). The scenarios found in the studies previously mentioned, are important because athletes with resilient profiles find it easier to deal with adverse situations (Belem et al., 2014). That is, when they go through a stressful situation, resilient athletes tend to recover more efficiently, in addition to retaining such experience to deal with similar situations in the future (Belem, Caruzzo, Nascimento-Junior, Vieira, & Vieira, 2014). In the study with ice hockey athletes, Kaplánová (2019) concluded that athletes with high levels of self-esteem and low anxiety levels are more resilient and have greater ability to focus on the task, even when unexpected adverse situations occur.

This scenario must have been repeated with the athletes in the present study, given the greater frequency of using the strategy "coping with adversity" during matches with greater difficulties, 1, 2 e 4. Coincidentally, MD2 refers to match 2, and the fact that the athletes lost match 1 must-have instigated, based on previous experience, the more frequent use of the strategy "coping with adversity" in the search for the first victory in the tournament. It should be considered that volleyball is a team sport with a high demand for unpredictability, which develops the athlete's skills to face the adversities experienced (Coimbra et al., 2013).

The present study results point to the importance of considering psychological aspects in sports training programming since anxiety can impair sports

performance. Therefore, the information obtained here can help technical commissions enable efficient ways of controlling anxiety and better planning activities between matches during a tournament with a congested schedule. As a limitation of the study, we can point out the lack of analysis of other factors such as stress, whether through questionnaires or salivary cortisol, aspects that could be associated with the results of the levels of anxiety and coping found in the present study. Another limitation is that the information was obtained through questionnaires that, although validated and widely used with athletes, do not evaluate the possible cause and effect interactions between anxiety and coping, being limited to statistical inference.

Conclusions

Based on this research's findings, the MD does not seem to interfere with the athletes' pre-competitive anxiety levels. However, it was found that athletes modulated coping strategies, both for the first match and for matches with greater difficulties. The coping strategies used contributed to the athletes' self-confidence being high throughout the tournament.

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