

Impact of coping strategies on resilience of elite beach volleyball athletes

Impacto das estratégias de coping na resiliência de atletas de vôlei de praia de alto rendimento

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Abstract – Studies have shown that for developing a resilient profile athletes must deal with adversities in sports using personal resources such as optimism, competitiveness, motivation, maturity, and persistence. The objective of this study was to analyze the impact of coping strategies on the resilience of beach volleyball athletes. Forty-eight adult athletes of the Banco do Brasil Beach Volleyball Circuit participated in the study. The following instruments were used: Athletic Coping Skills Inventory-28 (ACSI-28) and Connor-Davidson Resilience Scale (CD-RISC). The data were analyzed using the Shapiro-Wilk test, Mann-Whitney U test, repeated-measures ANOVA with post hoc Bonferroni test, Spearman's correlation test, and simple linear regression ($p < 0.05$). The coping skills that had an impact on the resilience of athletes were “personal coping resources” (48%), “coping with adversity” (33%), “confidence and motivation” (25%), “goal setting/mental preparation” (12%), and “coachability” (9%). Athletes invited to the Brazilian team showed high levels of resilience [median=91.50 (84.0-94.0)] and the most frequently used coping skills were “peaking under pressure” (MD=2.25), “coping with adversity” (MD=2.62), “goal setting/mental preparation” (MD=2.75) and “confidence and achievement motivation” (MD=2.75). It was concluded that the use of coping strategies to overcome problems, having defined goals, motivation and concentration during competitions have a significant impact on the development of a resilient profile in elite athletes.

Key words: Athletes; Psychological adaptation; Psychological resilience.

Resumo – Estudos têm apontado que, para desenvolver um perfil resiliente, os atletas precisam enfrentar as adversidades do contexto esportivo, utilizando recursos pessoais como otimismo, competitividade, motivação, maturidade e persistência. Este estudo objetivou analisar o impacto das estratégias de coping na resiliência de atletas de vôlei de praia. Participaram 48 atletas adultos do Circuito Banco do Brasil de Vôlei de Praia. Os instrumentos utilizados foram o Inventário de Estratégias de Coping (ACSI-28) e a Escala de Resiliência de Connor-Davidson (CD-RISC). Para a análise dos dados, utilizaram-se o teste de Shapiro-Wilk, “U” de Mann-Whitney, Anova de Medidas Repetidas seguida do Post Hoc de Bonferroni, Correlação de Spearman e Regressão Linear Simples ($p < 0,05$). Resultados: estratégias de coping que tiveram impacto na resiliência dos atletas foram o Índice de Confronto Geral (48%), “Confronto com adversidade” (33%), “Confiança e motivação” (25%), “Formulação de objetivos” (12%) e “Treinabilidade” (9%); atletas convocados para a seleção brasileira apresentaram altos níveis de resiliência [Md=91,50 (84,0-94,0)] e utilizam as estratégias de: “Rendimento máximo sob pressão” (Md=2,25), “Confronto com as adversidades” (Md=2,62), “Formulação de objetivos” (Md=2,75) e “Confiança e motivação” (Md=2,75). Concluiu-se que utilizar estratégias de enfrentar problemas, ter metas definidas, motivação e utilizar de concentração para as competições têm um impacto significativo no desenvolvimento do perfil resiliente de atletas de rendimento.

Palavras-chave: Adaptação psicológica; Atletas; Resiliência psicológica.

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INTRODUCTION

Elite sports have been indicated as a potentially stressful environment for the athlete¹, since factors such as injuries², pressure of the competition and coach³, anxiety⁴ and high training loads⁵ can influence the sport performance and success of the athlete⁶. To overcome these stressors and to maintain a good performance during competitions, athletes need to adapt to changing contextual demands⁷ by developing coping strategies⁸.

This cognitive stress management helps athletes to develop a resilient profile⁹, a psychological characteristic that explains the favorable responses of athletes during competitions even after they had experienced adverse circumstances¹⁰. According to the resiliency model in the context of sports¹¹, which served as a theoretical framework in the present study, the athlete needs to face challenges, stressful events and risks in order to learn to deal with these events. Therefore, coping strategies in conjunction with self-esteem, self-efficacy, task orientation, optimism and intrinsic motivation are fundamental psychological factors of protection for the development of resilience¹². In addition to these factors, personal resources (determination, competitiveness, commitment, maturity, and persistence) and sociocultural influences also play a role in the development of a resilient profile¹⁰.

Resilience has been indicated as one of the elements that permit athletes to achieve success⁹ and is a fundamental factor to overcome adversities encountered during their career¹³. According to Hosseini and Besharat¹⁴, high levels of resilience permit an individual to use positive emotions during unfavorable experiences, thus increasing the probability of success. In addition, more resilient athletes are more stable, have healthy levels of psychological functioning and physical competence, and tend to experience positive adaptations after exposure to a significant adversity¹⁵.

In the sport context, studies have investigated the relationship of resilience with psychological well-being¹⁶, sport achievement and mental health¹⁴, quality of life, depression and anxiety¹⁷, overcoming sports failure¹⁸, and negative effects of stress in sports⁹. Although cognitive stress management has been suggested to contribute to the development of resilience, it remains unknown whether coping strategies have an impact on the development of resilience, a gap that the present study intends to fill. In this respect, a sport (beach volleyball) was chosen which does not permit replacement of athletes during the competition, submitting them to various pressures, and which maintains the effectiveness and regularity of their performance with high technical levels¹.

The objective of the present study was to evaluate the impact of coping strategies on the resilience of beach volleyball athletes participating in one phase of the 2012 Banco do Brasil Beach Volleyball Circuit.

METHODOLOGICAL PROCEDURES

Participants

The target population of the study consisted of all athletes (24 doubles)

participating in one phase of the 2012 Under-21 Banco do Brasil Beach Volleyball Circuit, including 48 athletes (24 women and 24 men) with a mean age of 18 ± 1.3 years. The time of experience of the athletes was 4.3 ± 3.0 years. The mean daily training duration was 3.4 ± 1.0 hours, with a mean weekly training load of 17.1 ± 7.5 hours.

Instruments

The Athletic Coping Skills Inventory-28 (ACSI-28)¹⁹, adapted and validated for the Portuguese language by Serpa and Palmeira²⁰, was used for the investigation of coping strategies. This instrument evaluates coping strategies or competences of psychological adaptation in the sport context and consists of 28 items that are answered on a Likert scale. The results are classified into seven subscales: peaking under pressure, freedom from worry, coping with adversity, concentration, goal setting, confidence and achievement motivation, and coachability. The higher the score for each domain, the higher the coping ability. In addition, the subscales can be summed to yield a personal coping resources score, which ranges from 0 (low coping ability in a competitive situation) to 12 (high coping ability in a competitive situation). Cronbach's alpha coefficient of the instrument was 0.70, demonstrating strong reliability of the data.

The level of resilience of the athletes was evaluated using the Connor-Davidson Resilience Scale (CD-RISC)²¹, which was adapted and validated for the Portuguese language by Solano and Lotufo Neto²². The instrument consists of 25 questions that are answered on a 5-point Likert scale. The total score ranges from 0 to 100, with higher scores corresponding to higher levels of resilience (0-60 = low level of resilience, 61-84 = intermediate level of resilience, and 85-100 = high level of resilience). The reliability of the scale was $\alpha = 0.72$, indicating strong internal consistency of the data.

Procedures

The study is part of an Institutional Project which was approved by the Human Research Ethics Committee of the State University of Maringá (Universidade Estadual de Maringá) (Permit No. 339/2011). First, permission was obtained from the event organizers to collect data during the technical meeting that preceded the final phase. The data were collected during the technical meeting when the athletes were invited to participate in the study and signed the free informed consent form. The application of the instruments lasted on average 30 minutes.

Data analysis

The Shapiro-Wilk test was used to evaluate the distribution of the data. Since the data were not normally distributed, the median (MD) and quartiles (Q1; Q3) were used for characterization of the results. Cronbach's alpha coefficient was used to evaluate the internal consistency of the domains of the coping and resilience questionnaires. The Mann-Whitney U test was

applied to compare coping strategies of the athletes according to the level of resilience (intermediate/high). The sphericity of variances was estimated by ANOVA for repeated measures with Bonferroni's post hoc test to determine the predominant coping strategy of the athletes. Spearman's correlation coefficient was used for the correlation of variables (among athletes with a high level of resilience, $n=30$). Finally, simple linear regression was performed to evaluate the impact of coping strategies on resilience. A level of significance of $p<0.05$ was adopted for all tests.

RESULTS

The athletes showed intermediate levels of resilience [MD=82.0 (69.25 – 89.50)]. The coping strategies (Table 1) most frequently used by the athletes were “confidence and achievement motivation” [MD=2.50 (2.00-2.75)] and “goal setting” [MD=2.25 (1.87-2.75)].

Table 1. Median coping strategy score of athletes participating in the Under-21 Banco do Brasil Beach Volleyball Circuit.

Coping strategy	Median	(Q1-Q3)
1. Peaking under pressure	1.75 ^a	(1.50-2.25)
2. Freedom from worry	1.50 ^b	(1.25-2.00)
3. Coping with adversity	2.00 ^c	(1.75-2.50)
4. Concentration	2.00 ^d	(1.50-2.50)
5. Goal setting	2.25 ^{a,b,e}	(1.87-2.75)
6. Confidence and achievement motivation	2.50 ^{a,b,c,f}	(2.00-2.75)
7. Coachability	1.50 ^{c,d,e,f}	(1.25-1.75)
8. Personal coping resources score	7.57	(6.78-8.36)

* ANOVA for repeated measures. Significant difference ($p<0.05$) between: a) 1 and 5 ($p=0.024$); 1 and 6 ($p<0.0001$); b) 2 and 5 ($p=0.011$); 2 and 6 ($p=0.001$); c) 3 and 6 ($p=0.020$); 3 and 7 ($p<0.0001$); 3 and 8 ($p<0.0001$); d) 4 and 7 ($p=0.011$); e) 5 and 7 ($p<0.0001$); f) 6 and 7 ($p<0.0001$).

To compare the coping strategies according to level of resilience, the level of resilience was classified as low, intermediate and high. However, there were no athletes with low levels of resilience. Athletes classified as more resilient (Table 2) more frequently used coping strategies related to “coping with adversity” ($p=0.022$), “confidence and achievement motivation” ($p=0.002$), “coachability” ($p=0.06$), and “personal coping resources” ($p=0.001$). The comparisons between gender and ranking are not shown in Table 2 since no significant differences were observed.

As can be seen in Table 3, a high level of resilience of the athletes was positively correlated with the coping strategies “peaking under pressure” ($r=0.40$), “coping with adversity” ($r=0.44$), and “personal coping resources” ($r=0.49$). An intermediate level of resilience showed positive correlations with “coping with adversity” ($r=0.64$), “goal setting” ($r=0.69$), “confidence and achievement motivation” ($r=0.49$), and “personal coping resources” ($r=0.56$).

Table 2. Comparison of coping strategies according to the level of resilience of athletes participating in the Under-21 Banco do Brasil Beach Volleyball Circuit.

Coping strategy	Resilience				p
	Intermediate (n=18)		High (n=30)		
	Median	(Q1-Q3)	Median	(Q1-Q3)	
1. Peaking under pressure	1.75	(1.00-2.00)	2.00	(1.50-2.25)	0.057
2. Freedom from worry	1.50	(1.25-2.00)	1.50	(0.75-2.00)	0.479
3. Coping with adversity	1.75	(1.25-2.25)	2.25	(2.00-2.50)	0.022*
4. Concentration	1.75	(1.50-2.25)	2.25	(1.75-2.75)	0.058
5. Goal setting	2.00	(2.00-2.50)	2.50	(1.75-2.75)	0.132
6. Confidence and achievement motivation	2.00	(1.75-2.25)	2.50	(2.50-2.75)	0.002*
7. Coachability	1.25	(1.00-1.50)	1.50	(1.50-1.75)	0.006*
8. Personal coping resources score	6.78	(6.29-7.43)	8.00	(7.57-8.71)	0.001*

* Mann-Whitney U test. Significant difference: $p < 0.05$.

Table 3. Correlation of coping strategies according to the level of resilience of athletes participating in the Under-21 Banco do Brasil Beach Volleyball Circuit.

Intermediate resilience									
High resilience	1	2	3	4	5	6	7	8	9
1. Resilience	-	-0.35	-0.33	0.64**	.095	0.69**	0.49*	0.18	0.56*
2. Peaking under pressure	0.40*	-	-0.01	0.09	.040	0.03	-0.05	0.16	0.33
3. Freedom from worry	-0.16	0.01	-	-0.22	-.142	-0.28	-0.24	-0.30	-0.34
4. Coping with adversity	0.44*	0.21	-0.33	-	-.137	0.66**	0.58*	0.25	0.80**
5. Concentration	0.28	0.04	-0.28	0.24	-	-0.18	0.01	-0.27	-0.17
6. Goal setting	0.22	-0.15	-0.28	0.37*	.230	-	0.12	0.18	0.56*
7. Confidence and achievement motivation	0.10	0.07	-0.14	0.36	.093	0.19	-	0.07	0.63**
8. Coachability	0.13	0.17	-0.03	0.12	.196	0.08	-0.25	-	0.40
9. Personal coping resources score	0.49**	0.55**	0.12	0.64**	.204	0.47**	0.38*	0.37*	-

Significant difference: * $p < 0.05$; ** $p < 0.01$.

Simple linear regression between variables showing a correlation of $r > 0.40$ was performed for all athletes participating in the study in order to evaluate the impact of coping strategies on the athletes' level of resilience (Table 4). A highly significant impact ($p > 0.001$) was observed for the personal coping resources score (48%) and for the strategies "coping with adversity" (33%) and "confidence and achievement motivation" (25%). On the other hand, the coping strategies "goal setting" (12%) and "coachability" (9%) exerted a significant impact ($p < 0.05$), but at lower percentages.

Analysis of the level of resilience of athletes invited to the Brazilian team, considering the sport performance ($n=4$), showed a median level of 91.50 (84.0-94.5), which is considered to be high. The coping strategies most frequently used by these athletes were "peaking under pressure" [MD=2.25 (2.25-2.62)], "coping with adversity" [MD=2.62 (2.12-2.93)], "goal setting" [MD=2.75 (2.18-2.93)], and "confidence and achievement motivation" [MD=2.75 (1.56-3.0)].

Table 4. Impact of coping strategies on the level of resilience of athletes participating in the Under-21 Banco do Brazil Beach Volleyball Circuit.

	r	R ²	Adjusted R ²	B	CI	p
Coping with adversity	0.59	0.35	0.33	12.05	7.16; 16.96	0.001**
Goal setting	0.37	0.14	0.12	7.76	2.05; 13.48	0.009*
Confidence and achievement motivation	0.52	0.27	0.25	12.19	6.23; 18.16	0.001**
Coachability	0.33	0.11	0.09	9.24	1.50; 16.98	0.020*
Personal coping resources score	0.70	0.49	0.48	7.14	4.98; 9.30	0.001**

Simple linear regression: *p<0.05; **p<0.01.

DISCUSSION

To our knowledge, this is the first study investigating the impact of coping strategies on the level of resilience of elite beach volleyball athletes. Regression analysis revealed that the personal coping resources score and the strategies “coping with adversity” and “confidence and achievement motivation” had the highest impact on the athletes’ level of resilience (Table 4). In addition, more resilient athletes used coping strategies related to “coping with adversity”, confidence and achievement motivation”, “coachability” (Table 2), and “peaking under pressure” (Table 3).

It was noted that the more frequently athletes face general adversities of the sport and the higher their confidence and motivation, the greater will be their level of resilience, as demonstrated by regression analysis (Table 4). This finding might be related to the fact that the use of strategies designed to cope with stressful and challenging situations represents an important factor for the development of a resilient profile since, once they had encountered a short- or long-term stressor, individuals tend to reintegrate (recover) more effectively, becoming resilient¹².

The ability of coping with adverse situations is related to an increased perception of resilience among individuals²³. According to the resiliency model¹¹, exposure to adversities permits subjects to go through a process of reintegration during which resilient qualities (e.g., motivation, optimism, commitment, and persistence) are strengthened or added so that they can help deal with new conflict situations in the future.

This process of coping with adverse situations renders athletes more resilient and permits them to achieve personal growth as a result of psychological and physiological changes that teach them to deal well with difficulties¹². One aspect reported by athletes to be important for the development of resilience is the perception of positive results obtained after overcoming stressful situations, in which their fight is seen as an experience that, although painful, served to reinforce their personal resources and helps persist with a goal¹⁰. Furthermore, this coping permits greater knowledge and self-understanding and consequent self-control, which will help in situations in which the individual experiences a similar adversity¹¹.

The strategies of coping with adversity, confidence, motivation and coachability were a distinction of athletes with a high level of resilience (Table 2). These results agree with the findings of Yi et al.¹³ who also identi-

fied “coping with adversity” as the strategy most frequently used by elite Australian swimmers. The authors concluded that adaptive coping skills are related to the resilient responses of athletes. According to Nezhad and Besharat¹⁶, more resilient athletes tend to adapt better to times of challenge, regulating negative emotions as a result of the stress experienced and adapting positively through behavioral adjustment.

According to Straub¹⁵, problem-focused responses to stress occur when the individual deals directly with the stressor, reducing demands or even increasing the ability to cope with the stressful situation. This may result in proactive coping in order to prevent the stressor in advance, or in combative coping which is a reaction to the stressor that cannot be avoided. Therefore, the present findings agree with the resiliency model according to which coping strategies are a fundamental psychological factor of protection for the development of resilience¹¹.

The use of the strategy “coping with adversity” found in the present study (Table 3) has also been reported by Rosado et al.²⁴ for basketball players. The authors observed that the athletes used more problem-focused coping strategies, permitting better adaptation to stressful situations in the sport context. The use of coping strategies permits athletes to deal directly with the problem situation, whose focus is to find solutions for managing the stressors in order to overcome adversities¹⁵.

The factor “confidence and achievement motivation” was found to be a distinction of athletes, in agreement with the study of Nascimento Junior et al.²⁵ involving infantile and juvenile soccer players and of Mouratidis and Michou²⁶ involving athletes from different disciplines. Greater confidence and motivation permit athletes to better set their goals and to have more confidence in what they have learned and in their ability to successfully perform their functions in the team and during competitions²⁵. The use of the coachability strategy may be explained by the mean age of the athletes of the present study (18 years). In this respect, Vieira et al.²⁷, also studying beach volleyball athletes, showed that younger athletes are more willing to train since their objective is to participate in adult competitions.

Athletes invited to the Brazilian team showed higher levels of resilience, as well as high scores in a larger number of coping strategies, when compared to the remaining athletes (coping with adversity, goal setting, confidence and achievement motivation, concentration, and peaking under pressure). According to Galli and Vealey¹⁰, athletes with more diverse personal resources have a greater capacity to achieve sport success, since they have different ways or strategies to deal with stressors. In addition to personal resources, a high level of resilience may contribute to the sport success of an athlete by favoring more efficient recovery from stressful situations¹⁶.

One limitation of the present study was its cross-sectional design in order to permit the participation of athletes from one phase of the Brazilian Beach Volleyball Circuit. It was therefore not possible to determine whether coping strategies change during the season and interfere with the

level of resilience, which would be a suggestion for future studies. Another limitation is related to the size of the population which is a limiting factor for the statistical analysis used here, considering that regression analysis requires large samples. However, all athletes participating one of phase of the competition were evaluated. In addition, this is an original study that contributed to the understanding of the topic in the sport context, since studies on this issue have not yet been conducted.

CONCLUSION

Strategies related to the coping with adversity and motivation have an impact on the level of resilience of athletes; in this respect, resilient athletes more effectively overcome challenges and pressures of the sport environment when they use positive emotions during unfavorable experiences, increasing the probability of success. These findings indicate that coping strategies are involved in the positive recovery from unfavorable experiences, with this process permitting the individual to develop a resilient profile. As practical implications, we suggest coaches to encourage and develop coping strategies, helping athletes to clearly identify their challenges so that errors are not seen as something negative, but as a situation that needs to be overcome. This approach will improve the athlete's ability to cope with adversities and to improve personal resources that will contribute to the development of resilience.

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