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Resilience as a Predictor of Motivation and Anxiety in the Sport Performance of Amateur Athletes

La resiliencia como predictor de la motivación y la ansiedad en el rendimiento deportivo de deportistas amateurs

Luciana Ferreira
Renan Felipe Gregorini Françoso
Universidade Estadual de Maringá

Luana Ferreira de Belém
Universidade do Vale do Itajaí

Larissa Lucca Marção
Universidade Estadual de Maringá

Fernanda Carrosi Donato
Universidade Estadual de Maringá

Vânia de Fátima Matias de Souza
Universidade Estadual de Maringá

José Luiz Lopes Vieira
Universidad Católica del Maule-Talca

Abstract

This study aimed to investigate resilience as a psychological variable to predict motivation and anxiety concerning the performance of amateur beach tennis athletes. A total of 129 athletes of both sexes participated. To measure resilience, the Connor-Davidson Resilience Scale-10 for Brazil was used; to assess motivation for exercising, the Exercise Motivation Inventory was adopted, while state anxiety levels were assessed using the Competitive State Anxiety Inventory-2. For statistical analyses, Pearson's correlation, linear regression, and a t-test were

carried out. The main correlations were found between resilience and self-confidence, physical condition and disease prevention, physical appearance and weight control, enjoyment and stress control, competition and enjoyment, social recognition and physical appearance, and affiliation and enjoyment. It is concluded that resilience showed power to predict motivation in terms of increasing self-confidence and enjoyment; on the other hand, it led to decreased somatic anxiety among beach tennis athletes.

Keywords: **Racquet sports; Athletes; Sport psychology**

Resumen

El objetivo fue investigar si la resiliencia es capaz de predecir la motivación y la ansiedad en deportistas aficionados de tenis playa. Participaron 129 deportistas de ambos sexos. La resiliencia medida por la Escala de Resiliencia de Connor-Davidson-10, la motivación por el Inventario de Motivación por el Ejercicio y el estado de ansiedad se evaluaron mediante el Competitive State Anxiety-2. En el análisis estadístico se utilizó correlación de Pearson, prueba t y regresión lineal. Las principales correlaciones fueron entre resiliencia y confianza en sí mismo, motivación para el ejercicio físico y prevención de enfermedades, apariencia física y control de peso, diversión y manejo del estrés, competencia y diversión, reconocimiento social y apariencia física, y afiliación con la diversión. Se concluye que la resiliencia demostró el poder de predecir, en términos de motivación, el aumento de la confianza en sí mismo y la diversión y la disminución de la ansiedad somática en deportistas amateurs de tenis playa.

Palabras clave: **Deportes de raqueta; Atletas; Psicología del deporte**

Introduction

Nowadays, thousands of people are seeking a healthy lifestyle, with lifestyle being a sociological concept that encompasses tangible and intangible factors, that is, physical, psychological, and cultural aspects that constitute the way of life of an individual or a group (Brivio et al., 2023). People choose activities to perform, certain types of food, and recurring habits that define their way of living whether aiming to promote mental and physical health, improve sports performance, prevent stress-related diseases, or improve their quality of life (Wang & Boros, 2019).

Just as professional athletes, amateur ones go through periods of sport-specific training in order to maintain the performance levels required in the competitive scenario of amateur sports (Correia et al., 2017). However, sports competition can generate high levels of stress due to factors such as injury, overtraining, lack of intimate and emotional support, internal and external pressure to achieve

results, and dietary restrictions, among others (Chang et al., 2019; Fagundes et al., 2019; Granz et al., 2019).

For coping with competitive stress, resilience is considered an extremely important psychological capacity (Durand-Bush et al., 2022). The concept of resilience originates in physics and engineering, with one of its exponents being the Englishman Thomas Young. In this area, resilience is the ability of a material to withstand deformation energy without suffering it permanently (Yunes & Szymanski, 2001). Bringing this concept to the human sciences requires some caution, due to the complexity and multiplicity of factors and variables that must be taken into account in human activities (Yunes & Szymanski, 2001). In this sense, for the achievement of sporting excellence, psychological resilience in sports has been considered standard and is related to an athlete's capability to improve and achieve success and be able to persevere and rebound from inevitable setbacks and adversities that are inherent in sports resilience (Durand-Bush et al., 2022).

Athletes with levels considered ideal are able to face adverse situations arising from their sporting practice, such as challenges and pressures, in a healthier way, staying motivated to carry out their tasks and have good psychological functioning (Pons et al., 2018). On the other hand, it is clear from recent review studies that the dynamic process perspective is increasingly becoming the dominant theoretical framework to study resilience in sports (Kegelaers, 2023).

However, for one to start and remain engaged in competitive sporting practice, motivation is of fundamental importance (Deci & Ryan, 2012). Motivation has been addressed in sports studies based on the Self-Determination Theory (Rigby & Ryan, 2018), which indicates that, to feel motivated, one should have their basic psychological needs for competence, autonomy, and interpersonal relationships met.

On the other hand, certain emotions, such as anxiety, can negatively interfere with performance in the context of competitive sports practice. The multidimensional theory (Martens et al., 1990) structures competitive anxiety as a cognitive process that encompasses thoughts, judgments about oneself and doubts about performance in a competitive situation, being made up of three components: cognitive, somatic and self-confidence (Martens et al., 1990); moreover, Izabel Mercader-Rubio et al. (2023) report significant correlations between emotional clarity and emotional regulation, self-confidence, cognitive anxiety and somatic anxiety.

With the increasing demand for a lifestyle that promotes health but is also enjoyable, individuals have taken up the recreational and competitive practice of beach tennis. Therefore, this confirms the results found as to motivation to play

beach tennis, which is growing in Brazil; the number of practitioners in the country in 2021 stood at 400,000 people, whereas in 2023 this number rose to an estimated 1.1 million people playing beach tennis (Confederação Brasileira de Tênis [CBT], 2024). According to the Brazilian Tennis Confederation (CBT, 2024), the great success of this sport derives from the ease with which a person learns to play it and from the enjoyment it provides even for those who have never played it before, being the perfect combination for those who want to improve their physical fitness and take care of their health (Rosa & Alvarez, 2021).

Despite the considerable increase in the number of practitioners, research involving beach tennis has basically focused on reducing ambulatory blood pressure (Carpes et al., 2021; Domingues et al., 2022) or on the epidemiology of injuries (Berardi et al., 2020; Rodrigues et al., 2024). There is, therefore, a gap in the literature on the psychological aspects—such as resilience, motivation, and anxiety—present in amateur sports practice, especially in beach tennis, which is still a rising modality in the competitive sports context, since, in the literature consulted, no studies addressing psychological variables in this sport were found.

Based on the considerations presented, this study aimed to assess the role of resilience as a psychological variable capable of predicting motivation for practice and the level of anxiety of amateur beach tennis athletes, as well as to verify whether athletes at an advanced competitive performance level have higher levels of resilience and motivation and lower levels of anxiety when compared to athletes at an intermediate performance level.

Methods

This is a quantitative, cross-sectional study (Zangirolami-Raimundo et al., 2018) aimed at investigating the predictive power of resilience on the motivation and anxiety of amateur beach tennis athletes.

Participants

A total of 129 athletes participated in the study, including 59 female athletes (32.64±9.23 years) and 70 male athletes (36.30±11.19 years). For its purposes, beach tennis athletes competing in categories “A and B” were considered to be at an advanced level, and athletes in categories “C and D” were considered to be at an intermediate level.

Instruments

Connor-Davidson Resilience Scale-10 - RISC-10 (Connor & Davidson, 2003) translated to Portuguese (Lopes & Martins, 2011). Through this scale, the interviewee answers 10 questions in accordance with whether they consider the statement to

be true, thinking about the past month; if the statement did not occur in the past month, the interviewee has to answer considering how they think they would have felt if it had happened. The answers range from 0 to 4, with 0 being "not at all true," 1 being "rarely true," 2 being "sometimes true," 3 being "often true," and 4 being "almost always true." Cronbach's alpha for the resilience questionnaire is α:0.82.

Exercise Motivation Inventory-EMI-2 (Markland & Ingledew, 1997), version translated to Portuguese by Jose Alves and Antonio Lourenço (2003). To answer this questionnaire, the interviewee must indicate whether each of the statements is true or false when it comes to their current or future engagement in physical exercise. The individual answering the questionnaire will choose "0" if they think a statement is "not at all true," "5" if they think a statement is "very true," and then "1," "2," "3," or "4" if they consider the information to be partially true, according to the degree of truthfulness of each statement. This questionnaire seeks to understand the dimensions that lead athletes to exercise, including disease prevention, physical fitness, weight control, physical appearance, stress control, enjoyment, affiliation, health rehabilitation, competition, and social recognition. Cronbach's alpha for the motivation questionnaire is α:0.73.

State Anxiety Scale 2 (CSAI-2) (Martens et al., 1990). Translated to Portuguese by Fernandes et al. (2012), it consists of 17 questions that were answered before the competition, capturing how the individual was feeling at that moment, on a scale of 1 to 4, with number 1 representing "not at all" and number 4 representing "very much." Questions 02, 05, 08, 11, and 14 are related to cognitive anxiety; questions 01, 04, 06, 09, 12, 15, and 17 are related to somatic anxiety; while questions 03, 07, 10, 13, and 16 are related to self-confidence. Cronbach's alpha for the anxiety questionnaire is α:0.70.

Procedures

Those who agreed to participate by signing an informed consent form joined the study. They were informed that the research was submitted to the Ethics Committee for Research Involving Human Beings (Copep) and approved under opinion No. 6.932.152. Initially, authorization for the research to be conducted was requested from those responsible for organizing the tournament, with data collection being carried out at the competition venue.

Data Analysis

Data were analyzed with the aid of the Statistical Package for Social Sciences (SPSS) software, version 20. Descriptive statistics were conducted to adequately characterize the sample. The relationship between psychological variables was

examined through Pearson's correlation matrix ($p < 0.05$). To compare the groups (intermediate and advanced categories; male and female), Student's t-test was applied for independent samples. To estimate the predictive power of resilience on the dimensions of anxiety and motivation, a linear regression model was applied by means of the stepwise method.

Results

Table 1 presents data on the "resilience in amateur beach tennis athletes" psychological variable, on components of motivation for physical exercise, and on the anxiety subscales (cognitive, somatic, and self-confidence).

The results with moderate correlation (between 0.50 and 0.70) were found between resilience and self-confidence (0.55); somatic anxiety correlated with cognitive anxiety (0.55), and, concerning motivation for physical exercise, there was correlation between physical condition and disease prevention (0.57), physical appearance and weight control (0.66), enjoyment and stress control (0.69), competition and enjoyment (0.55), social recognition and physical appearance (0.53), and affiliation and enjoyment (0.61). There were other negative correlations for resilience with somatic and cognitive anxiety, but low correlation values, despite being statistically significant.

Table 2 shows a comparison concerning resilience scores, components of motivation for physical exercise, and anxiety among amateur beach tennis athletes considered to be at an intermediate or advanced level.

The results with statistically significant differences among amateur beach tennis athletes were found for the resilience, cognitive, and somatic anxiety psychological variables. These results showed that advanced-level amateur beach tennis athletes were more resilient and had less cognitive and somatic anxiety.

Table 3 presents the linear regression model that aimed to estimate the predictive power of resilience on the dimensions of anxiety and motivation. The final regression model showed an adjusted R2 value of 0.360.

Table 3 presented the predictive power of resilience on motivation and anxiety, and it was possible to observe that somatic anxiety, self-confidence, and enjoyment were the items with significant values.

Discussion

Resilience showed power to predict a decrease in somatic anxiety and an increase in self-confidence and enjoyment; with the same purpose, resilience acts as a predictor of demotivation, in addition to promoting controlled and autonomous motivation, as well as self-efficacy in dancer students or professionals

Table 1. Correlation among resilience, motivation, and anxiety in amateur beach tennis athletes

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Resilience														
1. Resilience	-	-.04	.10	.02	.10	**.23****	**.19****	**.24****	-.02	**.24****	.15	**-.40****	**-.36****	**.55****
Motivation														
2. Disease prevention		-	**-.57****	.07	.06	**.23****	**.19***	**.17***	-.02	.16	-.04	-.04	-.00	.04
3. Physical condition			-	.02	**.03**	0.13	.05	.09	.05	.08	.04	-.04	.02	.07
4. Weight control				-	**.66****	.26**	**.28****	**.33****	**.30****	**.21***	**.20***	**.18***	.07	-.013
5. Physical appearance					-	.19*	.13	**.27****	**.43****	**.29****	**.53****	.11	.05	.02
6. Stress control						-	**.69****	**.55****	.13	**.48****	.10	-.07	.04	.05
7. Enjoyment							-	**.61****	-.05	**.55****	-.07	-.03	.02	.05
8. Affiliation								-	.08	**.44****	-.11	-.04	-.06	.14
9. Health rehabilitation									-	.10	**.31****	.03	.12	-.03
10. Competition										**-**	**.23****	.01	-.01	**.33****
11. Social recognition											-	.02	.04	**.19***
Anxiety														
12. Cognitive anxiety												-	**.55****	**-.43****
13. Somatic anxiety													-	**.29****
14. Self-confidence														-
Mean	38.04	4.01	3.76	3.00	2.77	3.49	4.23	3.81	1.19	3.63	1.47	1.88	1.43	2.93
Standard Deviation	6.55	.89	.89	1.46	1.27	1.29	1.06	1.21	1.32	1.40	1.40	.00	.62	.78
Scale	1-50	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	1-4	1-4	1-4

Note: ** = ** = significance level > 0.01; * = significance level > 0.05

Table 2. Comparison as to resilience, motivation, and anxiety among amateur beach tennis athletes in the intermediate and advanced categories

	Intermediate (n=81)	**Advanced (n=48)**		
	Mean ± SD	**Mean ± SD**	**T**	***P-value***
Resilience				
Resilience	37.14±7.01	39.56±5.42	-2.058	**.042***
Motivation				
Disease prevention	4.05±.86	3.94±.95	.683	.496
Physical condition	3.70±.92	3.56±.84	.862	.390
Weight control	3.04±1.41	2.94±1.56	.371	.711
Physical appearance	2.83±1.17	2.67±1.43	.691	.491
Stress control	3.52±1.22	3.44±1.35	.349	.728
Enjoyment	4.17±1.09	4.33±1.01	-.827	.410
Affiliation	3.90±1.22	3.67±1.19	1.064	.289
Health rehabilitation	1.21±1.33	1.17±1.31	.179	.859
Competition	3.54±1.43	3.77±1.37	-.886	.377
Social recognition	1.48±1.41	1.44±1.39	.171	.864
Anxiety				
Cognitive anxiety	1.99±,79	1.71±.71	1.997	**.048***
Somatic anxiety	1.53±.65	1.27±.53	2.331	**.021***
Self confidence	2.88±.79	3.02±.75	-1.012	.313

Note: n = number; SD = Standard deviation

(Lazier-Leão et al., 2023). About “high resilience” and “moderate resilience” athlete’s profiles, emphasize that athletes with “high resilience” profiles were more likely to exhibit better health-related behaviors and have higher levels of psychological well-being and perceived performance; for these authors, the motivational climate was also related to the “high resilience” profile (Chrétien et al., 2024).

To assist athletes, training programs with an emphasis on mindfulness provide increased mental resilience and emotional intelligence in amateur athletes (Ajilchi et al., 2019). Therefore, programs for strengthening mental toughness develop a resilience filter composed of biopsychosocial protective factors, and the strength of this filter determines the impact of adversity and establishes the trajectory of positive adaptation (Gupta & McCarthy, 2022), corroborating with the theoretical framework that takes mental resilience in sports as a dynamic process that is always under construction (Kegelaers, 2023).

Table 3. Linear regression model to estimate the predictive power of resilience on motivation and anxiety among beach tennis players

	RC		WC	t	*p*	95.0% CI		R2	Adjusted R2
	B	Standard error	Beta			Lower limit	Upper limit		
Initial model									
Disease prevention	-.320	.665	-.044	-.482	.631	-1.638	.997	.407	.340
Physical condition	.622	.650	.085	.957	.340	-.665	1.910		
Weight control	.081	.469	.018	.172	.864	-.848	1.009		
Physical appearance	.141	.614	.027	.230	.819	-1.075	1.356		
Stress control	-.397	.568	-.077	-.699	.486	-1.521	.727		
Enjoyment	1.134	.768	.184	1.476	.143	-.388	2.656		
Affiliation	.488	.530	.090	.921	.359	-.561	1.537		
Health rehabilitation	.199	.413	.040	.483	.630	-.619	1.018		
Competition	-.157	.475	-.034	-.332	.741	-1.098	.783		
Social recognition	.317	.436	.068	.727	.469	-.547	1.181		
Cognitive anxiety	-1.034	.822	-.122	-1.257	.211	-2.662	.595		
Somatic anxiety	-1.809	.935	-.172	-1.934	.056	-3.661	.044		
Self confidence	3.555	.768	.424	4.631	.000	2.034	5.075		
Final model									
Somatic anxiety	-2.332	.777	-.222	-3.000	**.003***	-3.870	-.794	.375	.360
Self confidence	3.994	.620	.477	6.445	**.000***	2.767	5.220		
Enjoyment	1.012	.436	.164	2.321	**.022***	.149	1.875		

Note: RC = Raw coefficient; WC = Weighted coefficient; CI = Confidence interval; Durbin-Watson: 2.293

Consequently, in order for amateur beach tennis athletes to have greater mental resilience, coping strategies or skills for adaptation to the sporting situation (Smith et al., 1995) must be developed: a) maximum performance under pressure; b) absence of worries; c) confrontation with adversity; d) concentration; e) formulation of goals; f) confidence and motivation to take on a task; and g) trainability or availability to learn from training. Therefore, channeling different psychological skills through psychological training will increase resilience capabilities such as self-confidence (González-Hernández et al., 2020).

The results showed significant correlation between resilience and self-confidence, and these pieces of evidence were emphasize that the presence of constructs such as resilience, emotional intelligence, motivation and self-efficacy allows mentally resistant individuals to excel in stressful circumstances, instead of just facing them (Nicholls et al., 2015), in this same line of reasoning, pointed out that

sports confidence is considered a critical success factor for sports practitioners at all levels of performance (Machida et al., 2017).

Regarding the motivation of beach tennis athletes, the results showed that the players were more focused on disease prevention, physical appearance, and weight control (Chrétien et al., 2024); athletes with a high resilience profile are more likely to exhibit better behaviors related to health, well-being, and perceived performance, with high levels of awareness and extroversion. In terms of motivation for competition, the motivational values indicated the best result for the relationships between competition and affiliation, enjoyment, and social recognition. These results are interesting because amateur athletes seek to participate in competitions as a form of physical activity, emphasizing aspects related to having fun in a pleasant game environment and to involvement in the competition, mainly on the part of older adults (Stenner et al., 2019). These results are supported by the self-determination theory, indicating that those who remain in sports and stay engaged in physical exercises predominantly pursue reasons with intrinsic goals (Ley, 2020).

About cognitive and somatic anxiety, it is convenient to use resilient coping strategies differentiated according to sex and age, aiming to work on the protective factors that allow the athlete to perform better in the competitive context (Blanco-García et al., 2021). The relationship that resilience has with somatic anxiety and cognitive anxiety reveals that athletes with a high level of resilience are likely to have a lower level of cognitive anxiety (Fletcher, 2018), which is explained by the fact that these athletes are more self-confident, motivated, remain focused on their goals and see difficult situations more as a challenge to be overcome than a threat to be avoided, that is, athletes with higher levels of resilience have greater control over negative behaviors in sports practice (Cevada et al., 2012). Anxiety management is necessary because it can influence athletes' cognitive assessments, promote physiological arousal, and affect a range of performance-related situations, in addition to predicting if anxiety can be transferred from one situation to another and how this can vary depending on the athlete (Ford et al., 2017).

Advanced-level amateur beach tennis athletes differed from intermediate-level ones by presenting statistically significant higher values for resilience and lower values for cognitive and somatic anxiety. Therefore, resilience has a direct relationship with coping in stressful situations; athletes who exhibit resilient behavior probably perform better under stressful conditions (Mendes, 2024). On the other hand, although resilience is fundamental, resilience levels did not present significant differences when the competitive levels of athletes were compared; consequently, ideal performance does not necessarily mean being among the

athletes at the highest competitive level, but it is imperative to be able to efficiently use the resources at one's disposal in order to achieve the best possible sporting results (Blanco-García et al., 2021).

Limitations and future directions

This study is limited by the sample of beach tennis athletes competing only at the regional level and by being cross-sectional in nature. Longitudinal studies that map the daily adversities that occur in daily training and competitions are suggested, as well as research based on beach tennis programs aiming to minimize levels of anxiety, stress, and depression, and boost positive psychological variables such as coping strategies and resilience. Since beach tennis is a sport in which the game is played in doubles, future research should be aimed at investigating the personal factors of the doubles' interpersonal relationships, as well as identifying the stressful situations that take place during training sessions and competitions, with a view to improving resilient strategies for coping with these situations.

The results found have significant implications in training pedagogy and professional intervention, both for sports psychology and for the preservation of a healthy lifestyle among amateur beach tennis athletes. For amateur athletes, the results come as a warning of the need to develop coping strategies that prepare athletes to face the adversities imposed by the competitive sporting context.

Conclusion

It is concluded that resilience showed power to predict that amateur beach tennis athletes face competition as enjoyment; athletes with higher levels of resilience presented a higher level of self-confidence and less somatic anxiety in beach tennis competitions.

Advanced-level amateur beach tennis athletes (categories A and B) showed higher levels of resilience, which were significantly related to lower levels of cognitive and somatic anxiety compared to intermediate-level amateur beach tennis athletes (categories C and D).

Amateur beach tennis athletes who showed higher levels of resilience related their competitive practice to components of motivation for health—namely, disease prevention, weight control, and physical appearance—and to components of mental motivation—namely, stress management, enjoyment, personal recognition, and social affiliation.

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Luciana Ferreira

Doctoral degree in physical education from the State University of Maringá. Areas of expertise: motor development, children's physical education, sports psychology, professional training, and sports.
lferreira2@uem.br
https://orcid.org/0000-0001-5808-2334

Renan Felipe Gregorini Françoso

Bachelor's degree in Physical Education from the State University of Maringá, member of the Study and Research Group in Education, Physical Education, and Educational Policies (GEEFE). Beach Tennis teacher and coach of students and athletes.
rfgf1610@gmail.com
https://orcid.org/0009-0009-3865-090X

Luana Ferreira de Belém

Graduated in psychology from the University of Vale do Itajaí. Has experience in the field of psychology, with an emphasis on human development psychology. Works as an educational and sports psychologist.
luanaferreira.psicologia@hotmail.com
https://orcid.org/0000-0001-5808-2334

Larissa Lucca Marção

Degree in Physical Education from the State University of Maringá, is a Master's student in the Associated Postgraduate Program in Physical Education UEM-UEL. Member of the Study and Research Group in Education, Physical Education and Educational Policies (GEEFE).
lariilucca@gmail.com
https://orcid.org/0009-0001-0374-1053

Fernanda Carrosi Donato

Degree in Physical Education from the State University of Maringá. A member of the Research Group on Education, Physical Education, and Educational Policies, she conducts research on the following topics: initial teacher training, curricularization of extension programs, educational policies, physical education, and sports.
fernandodonatoo@hotmail.com
https://orcid.org/0000-0002-4544-6431

Vânia de Fátima Matias de Souza

Master's degree in Physical Education from the Associated Postgraduate Program in Physical Education UEL-UEM. PhD in Education from the Postgraduate Program in Education at the State University of Maringá. Has experience in the areas of initial teacher training, professional identity, and public policies for sport.
vfmsouza@uem.br
https://orcid.org/0000-0003-4631-1245

José Luiz Lopes Vieira

Doctoral degree in Human Movement Science from the Federal University of Santa Maria. Has experience in the following areas: motor development, sports pedagogy, and psychology of sport and physical exercise.
jllopesvieira@gmail.com
https://orcid.org/000-0003-0453-8185

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