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RESEARCH ARTICLE

Peculiarities of the Relationships between Anxiety, Psychological Skills, and Injuries in Cuban Athletes

Jesús Ríos Garit[1,*], Rosalía Cárdenas Rodríguez[2], Yanet Pérez Surita[3], Leonardo Rodríguez Méndez[3], Dayana Calviño Carvajal[4], Yoanny Soris Moya[4] and Roswel Borges Castellanos[4]

[1]*Centro Provincial de Medicina del Deporte de Villa Clara, Cuba. Universidad Central "Marta Abreu" de Las Villas, Cuba. Estrada Palma 200 I entre Unión y Maceo, Santa Clara, Villa Clara, Cuba*
[2]*Centro Provincial de Medicina del Deporte de Villa Clara, Villa Clara, Cuba*
[3]*Universidad Central "Marta Abreu" de Las Villas, Villa Clara, Cuba*
[4]*Centro Provincial de Medicina del Deporte de Villa Clara, Villa Clara, Cuba*

Abstract:

Background:

In the present research, the general and specific relationships of anxiety and psychological skills with the history of injuries in a heterogeneous population of Cuban high-performance athletes are analyzed.

Methods:

Through a correlational and cross-sectional study, the Villa Clara basketball, baseball, soccer, and softball preselection's were studied between 2019 and 2022. To obtain data on injuries, a specific questionnaire was applied. The state of the psychological variables was determined by means of the Competition State Anxiety Inventory and the Sports Execution Psychological Inventory. Data were analyzed using empirical frequency distribution, descriptive statistics, the Kolmogorov-Smirnov test, and Kendall's Tau_b nonparametric correlation coefficient.

Results and Discussion:

High anxiety and psychological skills to compete prevailed. Most of the athletes had been injured with remarkable frequency, severity and in competitions. Lower motivational levels, attention and emotional control are related to the occurrence of injuries. The most severe injuries are related to high levels of anxiety, less control of attention and negative coping, while the occurrence in competition is related to less control of attitude. The relationships between variables differ between the sports analyzed.

Conclusion:

A lower degree of psychological preparation makes the athlete vulnerable to injury. However, the psychological risk factors are established specifically in each sport. These differences must be considered for the design and implementation of injury prevention.

Keywords: Anxiety, Team sports, Psychological skills, Sports injury, Psychological risk factors, Injury prevention.

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1. INTRODUCTION

The study of the relationship between psychological variables and injuries has shown the importance of psychological preparation for the mental and physical health of the athlete, offering a holistic understanding of the psychological intervention and care for injuries in sport from a biopsychosocial approach. Several investigations have obtained evidence of the dependency of injuries on negative emotional states such as anxiety and low coping resources in the face of the stresses of sports activity [1 - 6].

Although the Stress and Injury Model [7, 8] guides the studies by offering a general explanation of the relationship between psychological variables and injuries, this field of research requires a greater degree of systematization of the results to determine which are the most relevant variables that they constitute risk factors in a general and specific way

* Address correspondence to this author at the Centro Provincial de Medicina del Deporte de Villa Clara, Cuba. Universidad Central "Marta Abreu" de Las Villas, Cuba. Estrada Palma 200 I entre Unión y Maceo, Santa Clara, Villa Clara, Cuba; Tel: +53 53667594; E-mail: jesus.rios@inder.gob.cu

according to the type of sport and the competitive level of the athletes.

It is essential to determine which are the most consistent relationships over time and what are the possible factors that condition these relationships. All this has not been possible due to the theoretical-methodological dispersion that has characterized the study of the subject, being expressed by several authors [9 - 11]. However, psychological injury prevention programs have been developed based on general results of studies in large populations of athletes of different modalities, experience, and competitive levels [12, 13].

Although these interventions have shown moderate effects on injury prevention, they have not been generalized, which means thinking about the development of compressive programs based on specific data in particular sports to maximize the results of psychological interventions given the principle of individualization of the sports training.

Before achieving the development and implementation of these specific programs, it is necessary to obtain criteria that support such a proposal, which is feasible and laudable by obtaining empirical findings that show the general trends and particularities of the relationships between psychological variables and injuries in different sports. For this, the common and differentiating characteristics that suppose psychological demands of the specific sports activity must be considered [14].

In this sense, the study of anxiety and the psychological variables of sports performance in their relationships with injuries has gone from having few studies [1, 3, 15, 16] to having a growing body of evidence in recent years, especially in Cuban athletes of high performance [6]. Although the results are still insufficient to establish trends and generalizations, they do allow a critical approximation of the characteristics of the relationships between these variables, which is why the present investigation was designed with the purpose of characterizing the relationships between anxiety and the psychological skills with the history of injuries in high-performance athletes of team sports.

2. METHODS

A correlational and cross-sectional study was carried out in the collective sports of the province of Villa Clara that have national championships in Cuba. The study was carried out between November 2019 and January 2022, always coinciding with the beginning of the preparation stage for the competitions of each year (2019, 2020, 2022). Data could not be obtained in 2021 because the COVID-19 pandemic did not allow championships to be held in that year and the teams were not integrated.

2.1. Subjects

A population of 200 high performance athletes was studied, Basketball n= 47 (23.5); Baseball n=49 (24.5%), Soccer n= 62 (31%) and Softball n= 42 (21%). The participants had a mean chronological age of 21.55 years (SD= 5.70) and a mean sports experience of 11.32 years (SD= 5). Only the softball athletes were female (n=42) and the rest were male (n=158).

2.2. Instrumentation

To obtain data and information, three instruments were applied in printed format. The start of three morning training sessions was taken to apply each instrument separately in each sport. In coordination with the head coaches of each team, optimal conditions were guaranteed for the proper application of the ad hoc Questionnaire on Sports Aspects and Injuries, the Competition State Anxiety Inventory to assess anxiety in competition and the Psychological Inventory of Sport Execution for the mental skills.

2.2.1. Ad hoc Questionnaire on Sports Aspects and Injuries

To record the injuries and the sociodemographic and sports characteristics, a specific self-report questionnaire used in other investigations was used, which allows retrospective information to be obtained on whether the athlete has been previously injured, the number of injuries he has suffered, the severity and the context of occurrence [17].

2.2.2. Competition State Anxiety Inventory

To assess competitive state anxiety, the Competitive Sport Anxiety Inventory was used in its Spanish version [18, 19]. The instrument has 27 items distributed in three subscales that measure cognitive, somatic and self-confidence anxiety with four Likert-type response options (1= Not at all; 2= A little; 3= Moderately; 4= A lot). Only the total scores of the cognitive and somatic anxiety scales were considered to classify anxiety as high (70-59 points), medium (58-50) and low (less than 50). It was obtained with a Cronbach's Alpha of .85.

2.2.3. Psychological Inventory of Sports Execution

For the evaluation of psychological skills related to sports performance, the *Psychological Inventory of Sports Execution* was used. This instrument constitutes the adaptation and assessment carried out by Hernández [20] of the *Psychological Performance Inventory* [21]. It is made up of 42 items on seven Likert-type response scales (from 1 = Almost Never to 5 = Almost Always). The variables were classified by obtaining quartiles. Self-confidence and motivational level high (30-28 points), medium (27-25) and low (less than 25). High attention control (26-24 points), medium (23-21) and low (less than 21). High Negative Coping Control (29-25 points), medium (24-20) and low (less than 20). Positive Coping Control and Visual Imaginative Control high (29-26 points), medium (25-23) and low (less than 23). High Attitude Control (30-28 points), medium (27-25) and low (less than 25). A Cronbach's Alpha coefficient of .75 was obtained for the Self-confidence factor, .71 for Negative Coping Control, .74 for Attention Control, .65 for Visual Imaginative Control, .68 for Motivational Level, .69 Positive Coping Control and .75 for Attitudinal Control.

2.3. Data Analysis

Empirical distribution of frequencies and descriptive statistics of central tendency and dispersion such as the mean, standard deviation, asymmetry, and kurtosis were used. The Kolmogorov-Smirnov test was applied to determine the distribution of the data and the non-parametric correlation coefficient Kendall`s Tau_b to determine the relationship

between the psychological variables and the variables that make up the injury history of the athletes. It is understood that the greatest strength of the correlation is expressed in the values closest to -1 and 1, while the negative and positive signs indicate the direction of the relationship between variables. A level of statistical significance where $p \leq 0.05$ was considered. The IBM SPSS Software Package (Version 25.0 for Windows) was used.

2.4. Ethical Considerations

Informed consent was obtained from the participating athletes. The research was presented, approved, and endorsed by the Scientific Council and the Medical Ethics Committee of the investigation of the Provincial Center of Sports Medicine of Villa Clara. The investigative procedure and the treatment of the data strictly follow the ethical precepts contained in the Declaration of Helsinki.

3. RESULTS

Tables **1** and **2** describe the distribution of the variables under study. Most athletes experience high anxiety in competition, although high-level mental skills predominate. It is observed that negative and visuo-imaginative coping control are the psychological skills with the lowest distribution at high levels. There is a high presence of athletes with a history of injuries. The injuries suffered have been mostly moderate, occurring more frequently in competitions. The variables under study do not follow a normal distribution.

Table 1. Distribution of psychological variables and history of injuries.

Variables		%
Anxiety state in competition	Low level	22.6
	Middle level	31
	High level	46.5
Self-confidence	Low level	21.9
	Middle level	23.2
	High level	54.8
Motivational level	Low level	21.9
	Middle level	28.4
	High level	49.7
Attention control	Low level	18.1
	Middle level	36.1
	High level	45.8
Negative coping control	Low level	25.2
	Middle level	25.2
	High level	49.7
Positive coping control	Low level	16.1
	Middle level	26.5
	High level	57.4
Visual and imaginative control	Low level	19.4
	Middle level	37.4
	High level	43.2
Attitude control	Low level	21.9
	Middle level	26.5
	High level	51.6
History of sports injury	Yes	72.5
	No	42.5
Sports injury number	1	30.4
	2	33.9
	>2	35.6
Sports Injury severity	Minor injury	43.4
	Moderate injury	52.1
	Serious injury	4.3
Sports injury context	In training	28.6
	In competition	71.3

Table 2. Description of the variables and normality test.

Variables	Mean	SD	Asymmetry	Kurtosis	Kolmogorov-Smirnov	*p.*
ASC	2.24	.798	-.458	-1.286	.294	.000
SC	2.33	.815	-.674	-1.163	.343	.000
ML	2.28	.802	-.545	-1.236	.313	.000
AC	2.28	.752	-.507	-1.069	.290	.000
NCC	2.25	.832	-.488	-1.387	.315	.000
PCC	2.41	.754	-.850	-.734	.356	.000
VIC	2.24	.757	-.429	-1.137	.275	.000
ATC	2.30	.807	-.593	-1.214	.324	.000
HSI	1.65	.480	-.613	-1.646	.415	.000
SIN	2.02	.827	-.034	-1.540	.231	.000
SIS	1.57	.581	.419	-.716	.311	.000
SIC	1.75	.545	-.085	-.319	.373	.000

Note. p < 0.05 (two-tailed); SD=Standard Deviation; ASC= Anxiety state in competition; SC= Self-confidence; ML= Motivational level; AC= Attention control; NCC= Negative coping control; PCC= Positive coping control; VIC= Visual and imaginative control; ATC= Attitude control; HSI= History of sports injury; SIN= Sports injury number; SIS= Sports Injury severity; SIC= Sports injury context.

Table 3. Relationship between psychological variables and injuries in the population.

Variables		HSI	SIN	SIS	SIC
Anxiety state in competition	Kendall`s Tau_b	.148	.090	.200*	.140
	p	.052	.289	.024	.112
Self-confidence	Kendall`s Tau_b	-.150	-.152	-.019	-.043
	p	.051	.074	.828	.624
Motivational level	Kendall`s Tau_b	-.193*	-.156	-.045	-.085
	p	.012	.067	.614	.332
Attention control	Kendall`s Tau_b	-.271**	.040	-.272**	-.043
	p	.000	.633	.002	.627
Negative coping control	Kendall`s Tau_b	-.221**	-.069	-.267**	-.072
	p	.004	.417	.002	.410
Positive coping control	Kendall`s Tau_b	-.219**	.009	-.047	-.114
	p	.004	.918	.593	.199
Visual and imaginative control	Kendall`s Tau_b	-.120	-.119	-.003	-.003
	p	.118	.161	.971	.974
Attitude control	Kendall`s Tau_b	-.100	.041	.043	-.227*
	p	.191	.631	.626	.010

Note. **p < 0.01 (two-tailed); *p < 0.05; HSI= History of sports injury; SIN= Sports injury number; SIS= Sports Injury severity; SIC= Sports injury context.

Table **3** shows the analysis of the relationship between psychological variables and the injury history of athletes without specifying the sport they practice. It is appreciated that the motivational level, attention control, negative and positive coping establish an inverse relationship with the occurrence of the injury. The number of injuries suffered showed no relationship with psychological variables, while the severity of injuries established a positive relationship with anxiety in competition and a negative relationship with attention control and negative coping. On the other hand, the context of occurrence was negatively related to attitude control.

Table **4** and Fig. (**1**) show that in basketball athletes only self-confidence establishes an inverse relationship with the number of injuries suffered. On the other hand, in baseball athletes, attention control, negative coping and positive coping are related to the occurrence of the injury. In these same athletes, the severity of the injuries suffered is positively related to competition anxiety and negatively related to attention control and negative coping.

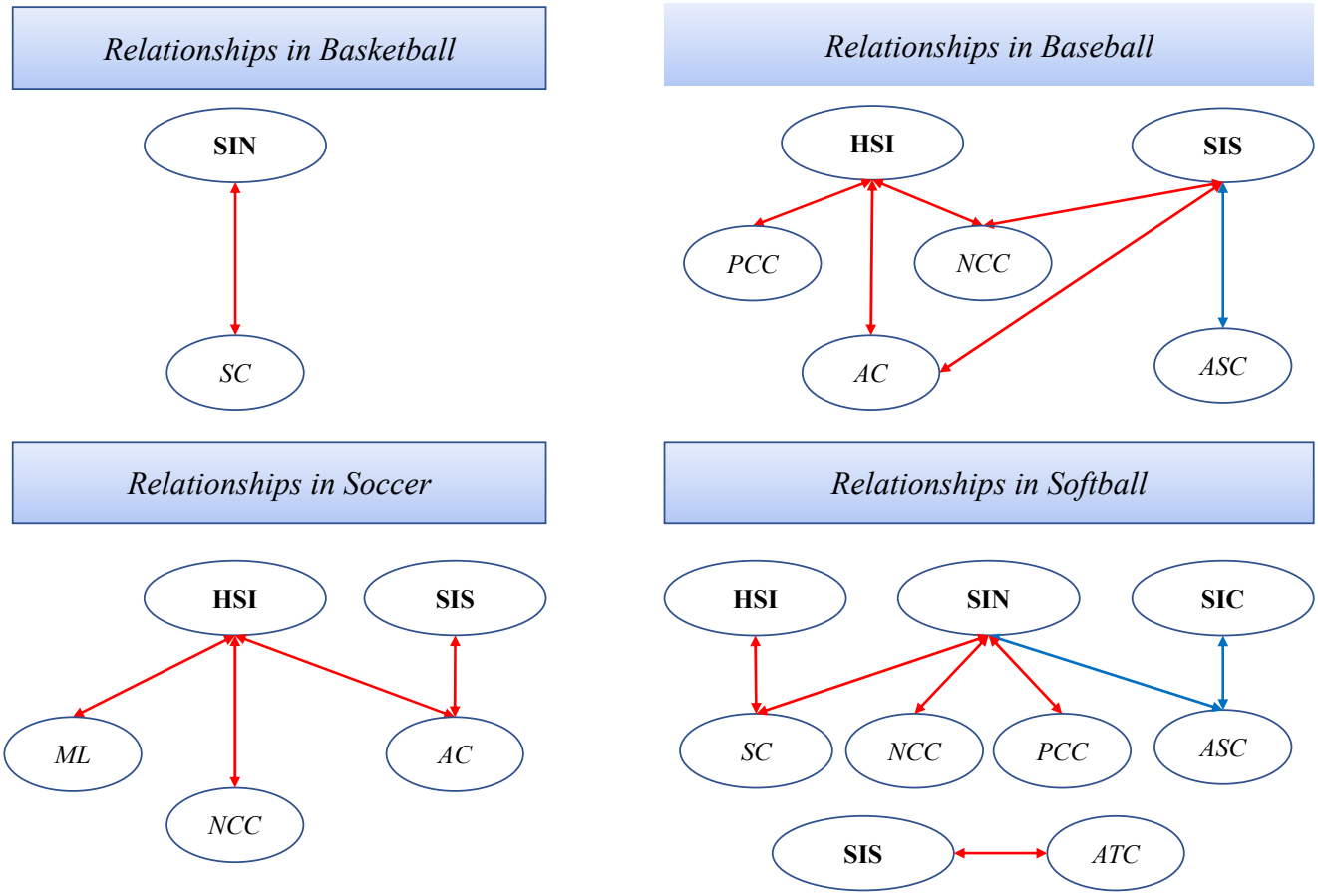

Fig. (1). Shows the relationships of the psychological variables with the history of injury, number, severity, and context of occurrence in each sport. Note. Blue Arrow= Positive Relationships; Red Arrow= Negative Relationships; ASC= Anxiety state in competition; SC= Self-confidence; ML= Motivational level; AC= Attention control; NCC= Negative coping control; PCC= Positive coping control; VIC= Visual and imaginative control; ATC= Attitude control; HSI= History of sports injury; SIN= Sports injury number; SIS= Sports Injury severity; SIC= Sports injury context.

Table 4. Relationships between psychological variables and injuries in each sport.

Sport/Psychological Variables		Sports Injuries							
		HSI		SIN		SIS		SIC	
		Kendall`s Tau_b	*p.*	Kendall`s Tau_b	*p.*	Kendall`s Tau_b	*p.*	Kendall`s Tau_b	*p.*
Basketball	ASC	.278	.174	-.208	.367	-.011	.961	.250	.267
	SC	.252	.214	-.482*	.039	-.105	.645	-.173	.448
	ML	.055	.785	-.079	.731	.067	.766	-.066	.769
	AC	.283	.160	-.449	.050	-.142	.529	.043	.848
	NCC	.358	.075	-.202	.377	-.258	.251	.021	.925
	PCC	.056	.782	-.198	.391	-.146	.520	-.376	.096
	VIC	-.201	.316	-.415	.071	-.166	.464	-.098	.664
	ATC	-.014	.945	-.285	.215	-.265	.242	-.424	.060
Baseball	ASC	.165	.226	.290	.058	.519**	.001	-.016	.920
	SC	-.171	.215	.029	.853	-.096	.557	-.150	.358
	ML	-.260	.060	-.264	.087	-.210	.199	-.288	.078
	AC	-.536**	.000	.203	.191	-.411*	.012	-.092	.574
	NCC	-.357**	.010	.046	.765	-.375*	.021	-.128	.433
	PCC	-.304*	.029	.066	.671	-.108	.513	-.119	.469
	VIC	-.229	.096	-.020	.896	-.145	.373	-.212	.194
	ATC	-.218	.113	.137	.372	.029	.857	-.107	.512

(Table 4) contd.....

Sport/Psychological Variables		Sports Injuries							
		HSI		SIN		SIS		SIC	
		Kendall`s Tau_b	*p.*	Kendall`s Tau_b	*p.*	Kendall`s Tau_b	*p.*	Kendall`s Tau_b	*p.*
Soccer	ASC	.232	.065	.196	.161	.104	.476	.058	.690
	SC	-.141	.249	.002	.991	.128	.364	.098	.485
	ML	-.300*	.014	-.125	.354	-.003	.981	-.024	.862
	AC	-.358**	.003	.160	.236	-.327*	.020	-.009	.947
	NCC	-.328**	.007	.069	.609	-.181	.198	.002	.989
	PCC	-.234	.056	-.068	.616	.048	.735	.004	.978
	VIC	-.124	.314	-.014	.917	.114	.419	.050	.722
	ATC	-.146	.232	.105	.440	.047	.736	-.150	.288
Softball	ASC	-.116	.589	.505*	.037	.103	.687	.606*	.018
	SC	-.558**	.008	-.657**	.006	-.065	.799	-.317	.211
	ML	.045	.833	-.151	.530	.079	.754	.078	.758
	AC	-.149	.480	.000	.000	-.095	.707	-.264	.295
	NCC	-.276	.197	-.772**	.001	-.314	.218	-.486	.056
	PCC	-.385	.075	-.500*	.040	.050	.847	-.032	.899
	VIC	.232	.274	-.041	.864	.237	.347	.388	.124
	ATC	.206	.332	.086	.723	-.561*	.027	-.324	.203

Note. **p < 0.01 (two-tailed); *p < 0.05; ASC= Anxiety state in competition; SC= Self-confidence; ML= Motivational level; AC= Attention control; NCC= Negative coping control; PCC= Positive coping control; VIC= Visual and imaginative control; ATC= Attitude control; HSI= History of sports injury; SIN= Sports injury number; SIS= Sports Injury severity; SIC= Sports injury context.

In soccer players, being injured is negatively related to motivational level, attention control and negative coping, while the severity of injuries is inversely related to attention control. In softball athletes, the occurrence of the injury is inversely related to self-confidence, the number of injuries is directly related to competition anxiety and inversely to self-confidence, negative and positive coping, while the severity of the injury it was inversely related to the control of the attitude, and the context of occurrence in a direct way with the level of anxiety in the competition.

4. DISCUSSION

The high presence of athletes who have suffered injuries is consistent with the findings of epidemiological studies that have confirmed the high prevalence of this relevant medical problem in sports [22 - 24]. The propensity to experience high anxiety in competition and the high development of psychological skills to compete is an expected finding in high-performance athletes who have achieved sports mastery, coinciding with several investigations [25 - 28].

In this heterogeneous population of high-performance ball game athletes, presenting low levels of motivation, attention control, negative and positive coping are risk factors for the occurrence of the injury. In addition, high competition anxiety and insufficient skills to control this negative emotion and stay focused on competitive activity are related to more serious injuries, while being injured during competition is related to poor attitude control.

Previous studies that have analyzed these same psychological variables in heterogeneous populations of athletes do not coincide with the results obtained in the present investigation, although the findings of previous studies are fundamentally like each other in terms of the number of injuries suffered. Berengüí-Gil *et al*. [15] determined in a study carried out on 34 male athletes in the technification process of Olympic Wrestling and Taekwondo, that the number of injuries suffered is related to the presence of less self-confidence, negative and positive coping control, while in a later study carried out on 84 athletes also in the process of technification of four individual disciplines (athletics, cycling, canoeing and taekwondo) found that the number of injuries was related to low control of negative coping and high anxiety in competition [16].

In another study also carried out in a heterogeneous population of 115 female and male athletics, cycling, canoeing and taekwondo athletes, also in the technification process, the authors determined that the number of injuries suffered is related to lower self-confidence and greater anxiety in competition, becoming psychological predictors of the number of times an athlete is injured [1]. On the other hand, an investigation carried out later 50 amateur triathletes of both sexes determined that the higher incidence of injuries is related to less positive coping control and attitude and that competition anxiety and low negative coping control explained 33% of the causes of injuries even when controlling the effect of other variables [3].

The previous studies [1, 3, 15, 16] have analyzed the relationships between anxiety and psychological skills in individual sports and athletes of both sexes in the technification process or amateurs. The most consistent findings are that high anxiety in competition and fewer skills to control negative emotions are risk factors for a greater number of injuries and, to a lesser extent, agree that low self-confidence and positive coping control are relevant risk factors.

A recent investigation with 63 high-performance male athletes (softball, soccer and baseball) also obtained divergent results, although the findings coincide in terms of the severity of the injuries suffered. Severity was related to low attention control and negative coping. These divergences, even in

populations of similar athletes, may be due to the influence of other uncontrolled factors, such as the relationship established between the psychological variables analyzed [6].

Regarding the relationships between anxiety in competition and psychological skills with injuries depending on the type of sport, specific and differentiating correlation matrices were obtained in the present study, even though the findings differ markedly between each sport and the correlation matrix overall obtained. These results denote the intrinsic complexity of the relationships between both groups of variables. Even notable divergences were obtained when comparing the findings in the same sport with different subjects. In this regard, it was obtained that the results coincide to a greater extent in softball athletes [29], since in both analyses, it was obtained that the occurrence of the injury is related to less self-confidence, the number of injuries is also related to less self-confidence and less emotional control, while greater severity is related to less control of attitude.

The results obtained in baseball athletes partially coincide with the findings of a previous investigation on baseball pitchers of different sports levels. The occurrence of the injury is related to lower self-confidence, negative and positive coping control. In addition, more serious injuries are related to greater anxiety in competition [30]. On the other hand, the results in basketball athletes differ almost completely from the findings in a similar investigation, only agreeing that the greater number of injuries suffered is related to lower self-confidence [31].

CONCLUSION

The divergences with the results of other investigations in heterogeneous and specific populations not only denote the complexity of the relationships between psychological variables and sports injury but also pose a problem for the generalization of psychological injury prevention programs following the Stress and Injuries model. Although the psychological preparation of the athlete must contain actions aimed at preventing injuries and their effect on the subjectivity of the athlete, the results obtained allow us to infer that preventive psychological intervention must be carried out in specific sports according to the relationships obtained between psychological variables and injuries.

These findings go beyond the conception of stress as an antecedent of the injury, establishing the need to reorient research in this field of study. Future research should have as its purpose the explanation of the causes and consequences of the relationships between the psychological variables that configure the risk of injury and vice versa. In this sense, a future line of research could be the analysis of how the type of sport mediates the relationships between anxiety, mental skills and injuries depending on their differentiating characteristics. In addition, it is necessary to determine how the intrinsic relationships between psychological variables can explain the complex and specific nature of the relationship with past and future injuries.

Despite the value of the results obtained in this research to glimpse the complexity of a phenomenon of notable relevance in sport, it is considered that the type of cross-sectional study and its descriptive-correlational scope constitute the main limitations of the findings, as well the low representation of the athletes analyzed over the Cuban sports population, which does not allow the results to be generalized at the national level. Therefore, it is considered that these limitations must be overcome to arrive at generalizable and more conclusive results.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study is part of the research project: "Psychological Preparation and Sports Injuries in Team Sports", approved and endorsed by the Scientific Council and the Medical Ethics Committee of the Provincial Center of Sports Medicine of Villa Clara, Cuba.

HUMAN AND ANIMAL RIGHTS

No animals were used for studies that are the basis of this research. All the humans were used in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013 (http://ethics.iit.edu/ecodes/node/3931).

CONSENT FOR PUBLICATION

The athletes participated voluntarily, giving their informed consent.

STANDARDS OF REPORTING

STROBE guidelines have been followed.

AVAILABILITY OF DATA AND MATERIALS

The data used in this study are available upon request from the corresponding author [J.R.G].

FUNDING

None.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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Declared none.

REFERENCES

[1] Berengüí R, Puga JL. Predictores psicológicos de lesión en jóvenes deportistas. Rev Costarric Psicol 2015; 34(2): 113-29.

[2] Catalá P, Peñacoba C. Factores psicológicos asociados a la vulnerabilidad de lesiones. Estudio de caso en un equipo de fútbol semi-profesional. Revista de Psicología Aplicada al Deporte y el Ejercicio Físico 2020; 5(1): e3. [http://dx.doi.org/10.5093/rpadef2020a5]

[3] González-Reyes A, Moo J, Olmedilla A. Psychological characteristics that influence sports injuries in amateur triathletes from Yucatan, Mexico. Rev Psicol Deporte 2017; 26(2): 71-7.

[4] Singh H, Conroy DE. Systematic review of stress-related injury vulnerability in athletic and occupational contexts. Psychol Sport Exerc 2017; 33: 37-44. [http://dx.doi.org/10.1016/j.psychsport.2017.08.001]

[5] Zafra AO, Martins B, Ponseti-Verdaguer FJ, Ruiz-Barquín R, García-

Mas A. It is not just stress: A bayesian approach to the shape of the negative psychological features associated with sport injuries. Healthcare (Basel) 2022; 10(2): 236. [http://dx.doi.org/10.3390/healthcare10020236] [PMID: 35206851]

[6] Ríos Garit J, Pérez Surita Y, Fuentes Domínguez E, Soris Moya Y, Borges Castellanos R. Anxiety and psychological variables of sports performance related to injuries in high-performance sportsmen. Apunts Sports Med 2021; 56(211): 100358. [http://dx.doi.org/10.1016/j.apunsm.2021.100358]

[7] Andersen MB, Williams JM. A model of stress and athletic injury, prediction, and prevention. J Sport Exerc Psychol 1988; 10(3): 294-306. [http://dx.doi.org/10.1123/jsep.10.3.294]

[8] Williams JM, Andersen MB. Psychosocial antecedents of sport injury: Review and critique of the stress and injury model'. J Appl Sport Psychol 1998; 10(1): 5-25. [http://dx.doi.org/10.1080/10413209808406375]

[9] Ortín F, Garces de los Fayos E, Olmedilla A. Influencia de los factores psicológicos en las lesiones deportivas. Pap Psicol 2010; 31(3): 281-8.

[10] Palmi J, Solé S. Psicología y lesión deportiva: estado actual. Apunt. Educ Fis Deporte 2014; 118: 23-9.

[11] Olmedilla Zafra A, García-Mas A. A global psychological model of the sportive injuries. Acción Psicológica 2009; 6(2): 77-91. [http://dx.doi.org/10.5944/ap.6.2.223]

[12] Ivarsson A, Johnson U, Tranaeus U, Hill D, Davidson CL. The bases expert statement on psychological considerations for injury risk reduction in competitive sport. The Sport and Exercise Scientist 2021; 8-9. Available from: https://www.bases.org.uk

[13] Olmedilla A, Moreno-Fernández IM, Gómez-Espejo V, Robles-Palazón FJ, Verdú I, Ortega E. Psychological intervention program to control stress in youth soccer players. Front Psychol 2019; 10: 2260. [http://dx.doi.org/10.3389/fpsyg.2019.02260] [PMID: 31681078]

[14] Ríos Garit J. Relationship between psychological predictors that contribute to injury prevention in baseball pitchers [unpublished doctoral thesis]. : Santa Clara: Central University "Marta Abreu" of Las Villas2021.

[15] Berengüí R, López JM, Garcés de los Fayos EJ, Almarcha J. Psychological factors and sports injuries in olympic wrestling and taekwondo. Rev Cienc Deporte 2011; 7: 91-8.

[16] Berengüí-Gil R, Garcés de Los Fayos EJ, Hidalgo-Montesinos MD. Características psicológicas asociadas a la incidencia de lesiones en deportistas de modalidades individuales. An Psicol 2013; 29(3): 674-84. [http://dx.doi.org/10.6018/analesps.29.3.175811]

[17] Olmedilla A, García-Montalvo C, Martínez-Sánchez F. Psychological factors and vulnerability to sports injuries: a study in soccer players. Rev Psicol Deporte 2006; 15(1): 37-52.

[18] Martens R, Burton D, Vealey RS, Bump LA, Smith DE. The competitive state anxiety inventory-2 (CSAI-2). In: Competitive Anxiety in sport, Human Kinetics. Chapaign 1990; pp. 117-78.

[19] Márquez S. Spanish adaptation of the questionnaires of antecedents, manifestations and consequences of anxiety in sports competition. factor structure. Rev Psicol Deporte 1992; 9: 25-38.

[20] Hernández A. Un cuestionario para la evaluación psicológica de la ejecución deportiva: Estudio complementario entre TCT y TRI. Rev Psicol Deporte 2006; 15(1): 71-93.

[21] Loehr J. Mental Toughness Training for Sports: Achieving Athletic Excellence. Stephen Greene Press 1986.

[22] Padegimas EM, Stepan JG, Stoker GE, Polites GM, Brophy RH. Epidemiology and severity of sports and recreation injuries presenting to a tertiary adult emergency department. Phys Sportsmed 2016; 44(3): 263-8. [http://dx.doi.org/10.1080/00913847.2016.1171683] [PMID: 27014859]

[23] Pujals C, Rubio VJ, Márquez MO, Sánchez-Iglesias I, Ruiz R. Comparative sport injury epidemiological study on a spanish sample of 25 different sports. J Sport Psychol 2016; 25(2): 271-9.

[24] Martínez Estupiñán LL, Santana Lugones JL, Pérez Ventura G. Las lesiones deportivas en el niño atleta. Análisis epidemiológico, tasas, severidad y riesgo. Rev Cub Med Dep Cult Física 2019; 14(3): e32.

[25] Reyes Bossio M, Raimundi MJ, Gómez Correa L. Programa de entrenamiento en habilidades psicológicas en jugadoras de voleibol de alto rendimiento. Cuad Psicol Deporte 2012; 12(1): 9-16. [http://dx.doi.org/10.4321/S1578-84232012000100001]

[26] Gómez-López M, Granero-Gallegos A, Isorna-Folgar M. Análisis de los factores psicológicos que afectan a los piragüistas en el alto rendimiento. Rev Iber Eval Psicol 2013; 35(1): 57-76.

[27] López-Gullón J, García-Pallarés J, Berengüí R, *et al.* Factores físicos y psicológicos predictores del éxito en lucha olímpica. Rev Psicol Deporte 2011; 20(2): 573-88.

[28] Raimundi MJ, Reigal RE, Hernández A. Argentine adaptation of the Sports Execution Psychological Inventory (IPED): validity, reliability and precision. Quad Psicol Sport 2016; 16(1): 211-22.

[29] Ríos Garit J, Pérez Surita Y. Relationships between Psychological Skills and Sports Injuries in Elite Cuban Softball Players. Acción Psicológica 2021; 17(1): 91-102. [http://dx.doi.org/10.5944/ap.17.1.26607]

[30] Ríos Garit J, Pérez Surita Y, De Armas Paredes M, Rodríguez Méndez L. Relación entre variables psicológicas y lesiones deportivas en lanzadores de béisbol. Podium (São Paulo) 2021; 16(1): 168-86.https://podium.upr.edu.cu/index.php/podium/article/view/908/pdf

[31] Ríos Garit J, Pérez Surita Y. Psychological factors related to injuries in high-performance basketball athletes in a Cuban province. Rev Hab Cienc Méd 2021; 20(5): e3430. Available from: http://www.revhabanera.sld.cu/index.php/rhab/article/view/3430