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Analysis of psychological variables predicting stress and sports-academic engagement in judokas

Análisis de las variables psicológicas predictoras del estrés y el compromiso deportivo- académico en judokas

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Abstract

The objective of this research was to know the relationship of the predictive variables of stress and commitment in the sports and academic context of adolescent judokas based on different personal characteristics, such as sex and sports level. Material and methods: A selective research methodology was used, with a retrospective ex-post-facto design. The sample consisted of 111 competing judokas (59 men and 52 women) aged between 11 and 19 years, all of them students of regulated secondary education. Results: In general, the sample effect size was large in variables like Sport Task Coping; medium in Sport Distancing Coping and short in Sport Emotion Coping. The correlational analysis between the variables of interest showed the existence of a negative relationship of stress with resilience and commitment, both in the academic and sports fields. Second, two clusters were extracted from the sample using the Ward's method and taking into account the interval provided by the squared Euclidean distance standardized by Z scores and generating a dendrogram. The analyses carried out show the existence of two large groups of judokas with similar characteristics to each other and different from the rest. The results verified the relationship between stress variables and the commitment between the academic and sports context, therefore, the sports practice could be used as a means to improve stress coping strategies and to improve commitment in the academic field. Conclusions: Sports stress predicts academic stress, and sports stress and resilience predict academic engagement.

Keywords: sports psychology; coping, resilience; commitment; stress.

Resumen

El objetivo de esta investigación fue conocer la relación de las variables predictoras del estrés y el compromiso en el contexto deportivo y académico de adolescentes judokas en función de distintas características personales, como el sexo y el nivel deportivo. Material y métodos: Se empleó una metodología de investigación selectiva, con un diseño ex-post-facto retrospectivo. La muestra estuvo formada por 111 judokas competidores (59 hombres y 52 mujeres) con edades comprendidas entre los 11 y los 19 años, todos ellos estudiantes de enseñanzas secundarias regladas. Resultados: En general, el tamaño del efecto de la muestra fue grande en variables como el afrontamiento deportivo de tarea; medio en el afrontamiento deportivo de distanciamiento y pequeño compromiso deportivo de emoción. El análisis correlacional entre las variables de interés mostró la existencia de una relación negativa del estrés con la resiliencia y el compromiso, tanto en el ámbito académico como deportivo. En segundo lugar, se extrajeron dos clústeres de la muestra mediante el método de Ward empleando el intervalo proporcionado por la distancia euclidea al cuadrado estandarizada mediante puntuaciones Z y generando un dendograma. Los análisis realizados muestran la existencia de dos grandes grupos de judokas con características semejantes entre ellos y distintas respecto al otro. Los resultados verificaron la relación entre las variables del estrés y el compromiso entre el contexto académico y deportivo, por lo que la práctica deportiva podría ser empleada como un medio para la mejora de las estrategias de afrontamiento del estrés y para la mejora del compromiso en el ámbito académico. Conclusiones: El estrés deportivo predice el estrés académico, y el estrés y la resiliencia deportivos predicen el compromiso académico.

Palabras clave: Psicología deportiva; afrontamiento; resiliencia; compromiso; estrés.

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Introduction

Sports practice provides psychophysical improvements optimizing the quality of life in its practitioners (Barbosa & Urrea, 2018). At a psychological level, improvements associated with regular practice are seen as an improvement in self-confidence, cooperation, communication and the promotion of values such as personal sacrifice or respect (Olmos, 2015) or the reduction of academic or work stress, among others (Jiménez et al., 2008). Sports practice increases the activation of the prefrontal cerebral cortex that entails improvements in different aspects related to the academic field, such as concentration or use of optimal coping strategies in the face of stressful situations typical of sports practice, especially in the competitive field (Jiménez et al., 2008; Serrano et al., 2015).

The benefits of sports practice on psychological and educational aspects of the individual are of special relevance in adolescence, but: Are all kinds of sport or sports practice equally beneficial for this group of people? These doubts have raised different investigations, such as the one by Carratalá (2020) regarding the suitability of practicing a certain group of sports based on the use of one type or another of psychological resources and their ability to transfer to the academic field. This same author indicates that the sports modality practiced, influences certain psychological aspects, providing higher levels of sports resilience in those who practice individual sports and a greater commitment in those who practice combat and individual sports. At the same time, it also indicates that the type of sports practice exercised, competitive or non-competitive, also provides different benefits, with competitors showing higher levels of resilience, coping with task-type stress, commitment and less stress.

Judo is a widely practiced sport, being the first fighting sport in our country, as indicated in the sports statistics yearbook of the Ministry of Culture and Sports (2020). Its intrinsic characteristics of combat sport with direct face-to-face confrontation, generate high stress situations, especially during competition, which demand adequate coping with stress and high resilience. Astrain (2017) carried out a meta-analysis of the practice of judo in adolescents in which he concluded that there was a shortage of studies with an adolescent population and with important limitations given the short intervention and / or sample time. However, the study of the competitive aspect in the adult population is extensive, and it is relatively easy to find research studies related to the temporal analysis of the fighting, technical and biomechanical analysis, physiological analysis or analysis of different psychological variables in order to improve sports performance.

Competitive sports practice is associated with stressful situations, as it is an individual sport with direct confrontation, high uncertainty, with great decisional demand in a short time Mora-Mérida et al. (2009). It can cause cognitive alterations such as loss of attention and / or concentration or increased anxiety, among other things. In addition to competitive stress, we can add the one produced in training due to the high technical-tactical requirement and psychophysical preparation of this sport (Hernández-García et al., 2009; Ruiz Barquín, 2012).

The judoka's ability to optimally manage stressful situations inherent to competition and fighting makes it a differentiating aspect compared to other competitors and is favourable for achieving positive results. In stressful situations, competitors use different ways of coping that we can organize into three groups: task-oriented coping, coping with emotions, and coping with distancing from the stressful situation (Lazarus & Folkman, 1986; Sandín & Chorot, 2003). Task-type strategies are those actions whose purpose is to change some of the aspects of the stressful situation. Emotional coping encompasses those actions whose purpose is to modify the meaning of the stressful situation and, in this way, regulate the result of negative emotions. On the other hand, the distancing coping strategies encompass all those actions that are used to

ignore the stressor element (Márquez, 2006). The priority mode of use of one type or another of coping is decisive in terms of improving performance, not only when dealing with sports but also on other personal aspects of life, since adolescent athletes usually use the same type of strategies both in their sports field and in other personal situations, including most academic situations (Carratalá, 2020). This priority job does not mean that if you use one of them, you discard the rest, but rather that you will opt mainly for the one that usually gives you the best result in conflict resolution (Silva et al., 2018).

The psychological dimension together with the competitive level or degree of competitive experience will be a key factor for the interpretation of psychological demands and their responses (Mellalieu et al., 2004), improving their sports performance, being the most important differentiating character as the sporting level increases, to the point that only those judokas who present great psychological strength will be able to reach their full potential. The ability to manage stressful situations produced before, during and after the competitive moment, will be of great importance to achieve positive results.

The importance of the psychological aspects for the competitive performance of the judoka are analysed in the research of Robles et al. (2019) where the importance that competitors give to these aspects to achieve and maintain their maximum competitive level is highlighted, and we understand it as the key factor for victory, being able to better withstand the training loads and pressure of high-level competitions. On the other hand, various authors (Robles et al., 2019; Silva et al., 2018) indicate the need for coaches to know and work on aspects such as perseverance, self-confidence or the ability to sacrifice, as they are determining factors of performance sport (increasing its importance as the competitive level of the athlete rises), in such a way that only those judokas who are psychologically strong will be able to reach their full potential.

Carratalá and Galán (2018) state that there are no scientific and technical reasons that indicate that competitive sport cannot have the same components associated with recreational sport such as the promotion of values or fun, provided that it is given a correct orientation by their coach and family environment, together with a motivational approach focused on the task. The relationship between sports practice and adolescence acquires great relevance due to its improvement, beyond the physical condition, of psychosocial aspects of vital importance for training, belonging to a group, social integration and improvement of their coping capacity and/ or resilience (Olmos, 2015); in short, for the development of their personality, which will result in improvements at the academic level. The relationship between sports practice and academic performance is found in different studies both at the national level, in the study by Serrano et al. (2015), and at the international level in the macro study of the California Department of Education (2004).

Academic commitment is one of the educational trends most in vogue within research framed in the educational field of secondary education, motivated by the tendency towards school failure in different countries of the European Union, triggered, among other reasons, by burnout. This factor, together with stress, the degree of school satisfaction, motivational orientations or the teacher-student relationship, among other aspects, are defined as predictive variables of the academic performance and, therefore, of academic commitment. We must understand this concept as all types of participation, from a multidisciplinary perspective, in academic achievements (Tomas et al., 2016). There is scientific evidence that associates commitment to academic achievement, such as the studies by Froiland and Worrell (2017) or Greene et al. (2004).

Studies that relate the commitment between sports and academic contexts in the adolescent population are scarce. A direct relationship between commitment, motivation and fun has been verified, both in the sports and in the academic context; the greater their relationship, the bigger the degree of fun (Prieto, 2016). However, we have found studies that indirectly relate both types of commitment, but without reaching a consensus on their results (Arias et al., 2014). However, regarding the relationship between sports practice and improvements in the academic context, there is a consensus, evidencing a relationship between competitive sports practice and academic performance motivated by commitment to the activity or perseverance, values that are presupposed in all competitors (Mandado & Díaz, 2004).

The purpose of this study was to analyse how different psychological and sociodemographic variables of stress and sports-academic commitment are related in a sample of adolescent judokas, paying special attention to the use of sports and academic coping strategies. We established, as the main hypothesis, that stress would be related to a greater use of emotional coping strategies (Berra et al., 2014) especially in the case of women. A second hypothesis indicated that coping strategies based on the task would be related to a higher commitment supporter by the research of Carratalá (2020), while those based on emotion would do so with a lower commitment. The last hypothesis put forward was that there would be groupings of subjects with psychological and sociodemographic characteristics similar to each other and different from the rest of the groups, and that the relationships between the variables of stress and commitment could depend on the cluster in which each athlete is located.

Material and method

Participants

To establish the minimum sample size, the GPower program, version 3.1.9.2, was used. For an inferential analysis of comparison of two groups, with an effect size f = .35, a probability error of $\alpha < .05$, and a potency of $1-\beta = .95$, a sample of 110 subjects resulted.

Finally, the sample consisted of 111 Spanish judokas, with 53.2% of the sample being men (n = 59) and 46.8% women (n = 52) aged between 11 and 19 years, (M = 14.78; SD = 1.84), with an average academic record of the previous year of 7.32 (SD = 1.239) out of 10 and an average of years of sports practice of 8.41 (SD = 3.11). The inclusion criteria in the study were: to attend regulated secondary education in a public or private center, to be an active competitive judoka and residing in the Valencian Community at the time of the study.

Measurements

The data collection for its subsequent analysis was carried out through a battery of tests, all of them validated for the Spanish population, to measure coping, resilience, stress and commitment in the sports and academic environment. Sports coping was measured using the Coping Strategies in Sport Competition by Molinero et al. (2010) composed by three dimensions (task, emotion and distancing) while academic coping was measured through the Coping Stress Questionnaire by Sandín & Chorot (2003) made up of seven dimensions (focus, self-focus, reappraisal, avoidance, emotional, support and religion). On the other hand, sports resilience was assessed through the 14-Items Sports Resilience Questionnaire (RS-14) by Wagnild and Young, validated by Sánchez-Teruel and Robles-Bello (2015) with two dimensions (personal and acceptance). Academic resilience was measured with the Connor and Davidson CD-RISC questionnaire validated by Serrano-Parra et al. (2012) which is composed of three dimensions (tenacity, personal and social). To measure sports stress, the Pedrosa et al. (2012) the unidimensional EEAD Questionnaire was used; and for academic stress, the Perception Scale of Cohen et al. (EEP / PSS) in its 14-item version validated by Remor and

Carrobles (2001) that consists of two factors (helplessness and self-efficacy). Regarding sports engagement, it was measured using the Orlick Sports Engagement Scale validated by Belando et al. (2012) which is composed of two dimensions (current and future commitment). Academic engagement was measured using the Schaufeli and Bakker UWES-S Questionnaire, validated and abbreviated (9 items) by Parra and Pérez (2010) made up of two dimensions (readiness and satisfaction). The final factors and the number of items that compose it can be seen in table 1.

The responses were presented by means of a Likert scale with a range of values from 1 (never) to 5 (very often) in all variables except for the variable academic commitment, which uses a Likert scale with values from 0 (never) to 6 (every day). The alpha coefficients of each of the measured dimensions are shown in Table 1. It should be noted that all alphas were adequate, with values higher than .70, with the exception of the task facing both in the academic and sports environments that, although It was higher in both cases than .60, in neither of both did it reach the value considered adequate, so the results in relation to this type of coping must be taken with caution.

Table 1. *Dimensions and reliability of the scales used in the study and coefficients Alfa*

Variable	Questionnaire	Items	Measures	α
Sport Coping	Coping Strategies in Sport Competition (Molinero et al., 2010)	38	Task Coping Emotional Coping Distance Coping	.601 .827 .874
Academic Coping	Coping Stress Questionnaire (Sandín & Chorot, 2003)	42	Task Coping Emotional Coping Distance Coping	.658 .742 .805
Sport Resilience	14-Items Sports Resiliencie Questionnaire (RS-14) (Sánchez-Teruel & Robles-Bello, 2015)	14	Sport Resilience	.738
Academic Resilience	CD-RISC (Serrano-Parra et al., 2012)	17	Academic Resilience	.859
Sport Stress	EEAD Questionnaire (Stress Scale in the Sports Field) (Pedrosa et al., 2012)	15	Sport Stress	.757
Academic Stress	Stress Perception Scale (EEP/ PSS) (Remor & Carrobles, 2001)	14	Academic Stress	.834
Sport Commitment	Sports Engagement Scale (Belando et al., 2012)	11	Sport Commitment	.899
Academic Commitment	Questionnaire UWES-S (Parra & Pérez, 2010)	9	Academic Commitment	.901

A questionnaire of sociodemographic data on aspects related to their level of sports practice was administered jointly. This variable was measured using a scale of 1 to 3, where 1 was a regional area, 2 was national and 3 was international. To specify the academic field, they were asked about the average of the grades obtained the previous year.

In order to make different groupings, they were asked about their age and sex, understanding this variable from the biological point of view, the value being 1 male and 2 female.

Procedure

A selective research methodology was used, with a retrospective ex-post-facto design. Once the approval of the Human Research Ethics Committee of the University of Valencia (procedure number H1521722527067) was given, informed consent was administered to the study participants, indicating that their anonymity was guaranteed, as well as that they could interrupt and end their participation in the study at any time they wanted by virtue of the agreements

established in the Declaration of Helsinki and the Law on Protection of Personal Data (LOPD) 15/1999, of December 13. Subsequently, the questionnaires were applied between December 2019 and February 2020.

Data analysis

For data analysis, we performed an analysis of normality using Kolmogorv-Smirnov test and correlational and inferential analysis of the psychological variables of the study. In the correlational analysis, the relationships between the psychological and sociodemographic variables were analysed through the calculation of the Pearson correlation coefficient. For the inferential analysis, first groups of athletes were generated through Ward's method, generating a dendrogram from which two clusters were extracted. This method is characterized by using the total sum of the squares of the deviations between each point (individual) and the average value of the cluster in which it is integrated to perform the groupings. In order to know the dissimilarity between variables, the Euclidean distance was used as they were homogeneous variables and measured in similar units as they were standardized by Z scores. The dendrogram generated should be understood as a hierarchical graph where the steps of the clustering process are visualized by means of a tree diagram. The cross-section for deciding the number of clusters does not follow a fixed structure, in our case we decided to choose the level that allowed us to distinguish between two clusters, which had a sufficient sample size to have an acceptable study power, as indicated in the study of the minimum sample size. Subsequently, a multivariate GLM analysis of the differences between these groups in the variables analysed was also performed. Finally, we carried out a multivariate linear regression analysis to find out the predictive variables of commitment and stress, in general and for each of the clusters. For all this we use the SPSS statistical package in its version 26.0. The data associated with the article is not publicly available, but it would be upon request to the main author.

Results

Correlational analysis

First, we performed a general correlational analysis between the different study variables (Table 2). Sports stress presented significant positive relationships with emotional and distancing sports coping and with academic stress. But it was also negatively related to sports resilience. On the other hand, academic stress presented significant positive relationships with academic emotional coping, sports coping with distancing and negative relationships with sports resilience. Regarding the Sport Commitment, there was a significant positive relationship with Sport Task Coping and Sport Resilience. On the other hand, the Academic Commitment positively correlated with the Academic Task Coping, Academic Resilience, Sport Task Coping and Sport Resilience.

Table 2. *Descriptive (average and standard deviation), reliability of the scale (alpha) and Pearson's correlation coefficients of the study variables for the general sample.*

Sport variables	M	SD	1	2	3	4	5	6
1. Sport Task Coping	3.51	.719	1	.115	.352**	-.154	.397**	.406**
2. Sport Emotion Coping	2.24	.702		1	.346**	.454**	-.201*	-.058
3. Sport Distancing Coping	2.41	.604			1	.190*	.036	.047
4. Sport Stress	4.10	.600				1	-.466**	-.094
5. Sport Resilience	3.77	.538					1	.233*
6. Sport Commitment	2.01	.573						1
Academic variables	M	SD	1	2	3	4	5	6
1. Academic Task Coping	3.00	.437	1	.257**	.382**	.086	.455**	.235*
2. Academic Emotion Coping	2.21	.481		1	.130	.190*	.254**	.122
3. Academic Distancing Coping	3.24	.710			1	.161	.054	.062
4. Academic Stress	3.19	1.427				1	-.090	.004
5. Academic Resilience	3.64	.587					1	.341**
6. Academic Commitment	3.09	.611						1
Academic-Sport correlation			1	2	3	4	5	6
1. Task Coping			**.552****	.203*	.203*	-.149	.278**	.237*
2. Emotion Coping			.406**	**.278****	.132	-.092	.179	-.023
3. Distancing Coping			.303**	.171	**.271****	.043	.105	.012
4. Stress			.037	.349**	.212*	**.467****	-.254**	-.145
5. Resilience			.480**	-.031	.078	-.288**	**.483****	.256**
6. Commitment			.300**	-.024	-.012	-.351**	.449**	**.051**

Note: ** The correlation is significant at the .01 level (bilateral). / * The correlation is significant at the .05 level (bilateral)

Analysis by clusters

To perform the inferential analysis, an analysis of relationships between the members of the sample was used using the Ward's method, using the interval provided by the standardized squared Euclidean distance by means of Z scores and generating a dendrogram from which the number of clusters was extracted (2), taking as a reference the line 20 of re-scaled distance approach. The analysis of the dendrogram showed the existence of two clusters that correspond to the following characteristics: Cluster 1) Judokas with high commitment and low stress both in the sports and academic context and cluster 2) Judokas with less commitment and more stress both at the sports and academic levels.

Cluster 1 (table 3) consisted of 48.65% of the sample (n = 54), being mostly men with a 72.2% (M = 1.28, SD = .452) and with an average academic record of the previous year of 7.41 (SD = 1,150) out of 10. The analysis of their psychological variables showed values higher than those of cluster 2, in almost all the psychological variables except for Academic Stress and Sport Stress, being especially significant in Sport Task Coping, Sport Resilience, Sport Commitment, Academic Task Coping and Academic Resilience.

Cluster 2 (table 3) grouped the remaining 51.35% (n = 57) of the judokas, made up slightly more by women with a 64.9% (M = 1.64, SD = .486) and, on average, with an academic record of the previous year of 7.23 (SD = 1,322) out of 10. At a psychological level, they presented lower levels than cluster 1, in all its variables except for Sport Stress and Academic Stress.

Finally, an inferential analysis between clusters and post-hoc tests was carried out to study the differences between peers.

Inferential analysis

Prior to the inferential analysis, a normality analysis was performed with the Kolmogorov-Smirnov test. With the exception of age, average academic record, sports level and gender, the rest of the variables were adjusted to normal. Therefore, we decided to use parametric statistics. Levene's test did not show differences in homogeneity in any of the variables. We performed a multivariate general linear model (GLM) analysis that showed significant differences in various variables, which are shown in Table 3.

Table 3. *GLM Multivariate Summary Comparison Between Clusters*

Variable	M Cluster 1 (SD)	M Cluster 2 (SD)	F	Sig	η^2partial
Sport Task Coping	3.93(.506)	3.11(.668)	52.20	<.001	.324
Sport Emotion Coping	2.35(.705)	2.13(.690)	2.65	.107	.024
Sport Distancing Coping	2.56(.579)	2.27(.599)	6.45	.013	.056
Sport Resilience	4.06(.418)	3.51(.504)	38.96	<.001	.263
Sport Stress	1.82(.447)	2.20(.619)	13.81	<.001	.112
Sport Commitment	4.34(.517)	3.88(.593)	18.48	<.001	.145
Academic Task Coping	3.24(.332)	2.77(.402)	45.24	<.001	.293
Academic Emotion Coping	2.35(.391)	2.09(.526)	8.61	.004	.073
Academic Distancing Coping	3.31(.727)	3.18(.696)	.98	.325	.009
Academic Resilience	3.93(.481)	3.35(.540)	35.33	<.001	.245
Academic Stress	2.95(.547)	3.23(.642)	6.20	.014	.154
Academic Commitment	3.57(1.262)	2.83(1.491)	7.82	.006	.067
Age	14.91(1.719)	14.67(1.958)	.47	.494	.004
Grade Point Average	7.41(1.150)	7.24(1.323)	.54	.463	.005
Sport level	1.74(.650)	1.58(.656)	1.97	.164	.018
Sex	1.28(.452)	1.65(.481)	17.50	<.001	.138

After the distribution of the study sample according to their sports and academic psychological characteristics, and grouped according to the membership cluster, two sectors were seen highlighted in the following scatter graph (Figure 1). The yellow sector was made up mostly of subjects from cluster 1, the judokas with the highest levels of commitment in the sample and under sporting stress belonged to this group. On the other hand, we find the pink sector composed mainly of athletes from cluster 2 characterized by academic stress. Between both sectors, a transition zone with judokas from both clusters appeared whose their psychological tendencies are not specially defined with respect to the study variables.

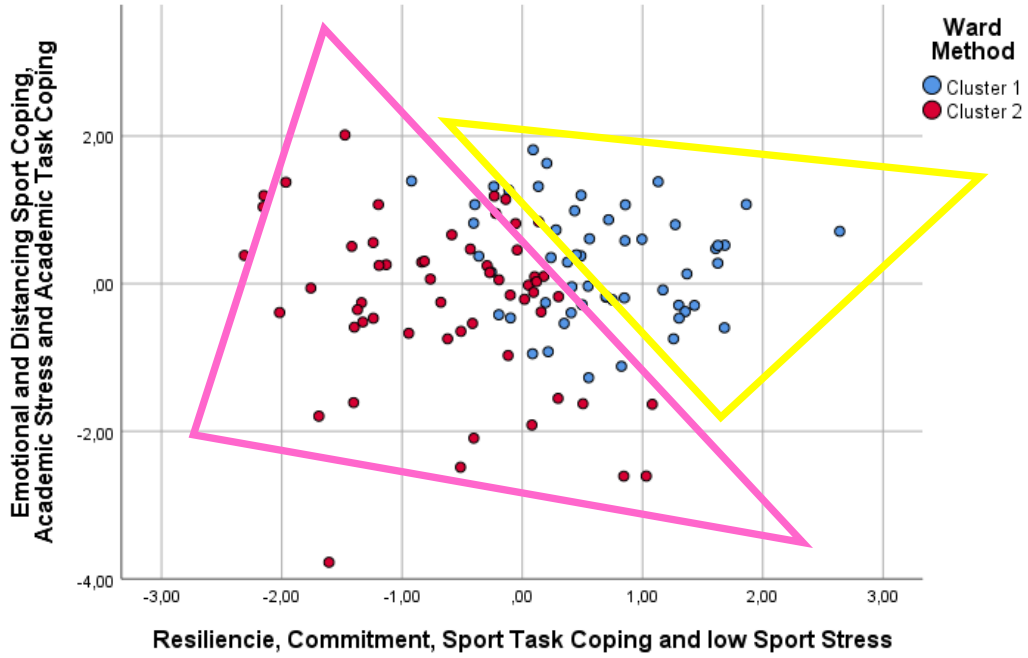

Figure 1. Cluster scattering plot

Predictive analysis

Two multivariate linear regression analyses were performed for each group and for the sample as a whole. In the first one, the predictive variables of stress were analysed and in the second, we analysed the predictive variables of commitment.

Predictive stress analysis

The main determinants of stress (table IV), at a general level, were Emotional Sport Coping (β = .301; p = .001) and Sport Resilience (β = -.205; p = .039) in the sports field and, Sport Stress (β = .384; p = .001), Academic Stress (β = .301; p = .001), Academic Commitment (β = -.227; p = .014) and Sex (β = .224; p = .017) in the academic context. If we look at the predictor variables by cluster, we observe that in cluster 1 there was no significant determinant of stress, not in the sports or academic contexts. In cluster 2, Emotional Sport Coping (β = .456; p = .005) was the main predictor of sports stress. On the other hand, the variables Emotional Sport Coping (β = .404; p = .012), Academic Task Coping (β = .294; p = .027) and Sex (β = .246; p = .041) obtained the most significant levels in the academic context.

Table 4. *Predictor variables and trends in the linear regression analysis of the determinants of stress for each cluster and for the sample in general.*

Group	Determinants	ANOVA F (Sig.)	Predictor V	β	Sig.	IC95% lower	IC95% higher
Cluster 1	Sports	-	-	-	-	-	-
	Academics	-	-	-	-	-	-
Cluster 2	Sports	3.94(<.001)	Emotional Sport Coping	.456	.005	.134	.685
	Academics	4.05 (<.001)	Emotional Sport Coping	.404	.012	.086	.665
			Academic Task Coping	.294	.027	.056	.883
			Sex	.246	.041	.014	.642
General	Sports	6.37(<.001)	Emotional Sport Coping	.301	.001	.101	.391
			Sport Resilience	-.205	.039	-.426	-.011
	Academics	3.63(<.001)	Academic Stress	.301	.001	.123	.441
			Academic Commitment	-.227	.014	-.163	-.019
			Sport Stress	.384	.001	.178	.640
			Sex	.224	.017	.050	.496

Predictive engagement analysis

At a general level, the Sport Task Coping (β = .478; p = <.001) and the Level (β = .386; p = <.001) appeared as the main predictors of sports commitment (table V), while for the academic commitment the main predictor variables were the average of the academic record (β = .274; p = .003), Age (β = .196; p = .027), Sport Resilience (β = .267; p = .014) and Sport Stress (β = -.275; p = .014). For cluster 1, the sports level was the variable that best predicted sports commitment (β = .412; p = .013) while age was the most significant predictor variable at the academic level (β = .454; p =. 003). On the other hand, in cluster 2, regarding the sports field, were the variables Sport Task Coping (β = .554; p = .002), Emotional Academic Coping (β = -.316; p = .033) and GPA (β = -.345; p = .028) and, in the academic context, the variables that best predicted commitment were sport level (β = .430; p = .002) and Sport Resilience (β =. 318; p = .022).

Table 5. *Predictor variables and trends in the linear regression analysis of the determinants of commitment for each cluster and for the sample in general.*

Group	Determinants	ANOVA F (Sig.)	Predictor V	β	Sig.	IC95% lower	IC95% higher
Cluster 1	Sports	1.40(.199)	Level	.412	.013	.072	.583
	Academics	1.99(.043)	Age	.454	.003	.123	.544
Cluster 2	Sports	2.30(.018)	Sport Task Coping	.554	.002	.187	.797
			Academic Emotional Coping	-.316	.033	-.683	-.030
			GPA	-.345	.028	-.292	-.018
	Academics	2.95(.003)	Level	.430	.002	.173	.729
			Sport Resilience	.318	.022	.140	1.746
			GPA	*.288*	*.053*	*-.004*	*.653*
General	Sports	4.42(<.001)	Sport task coping	.478	<.001	.208	.589
			Level	.386	<.001	.199	.525
			GPA	*-.180*	*.054*	*-.176*	*.001*
	Academics	4.157(<.001)	Sport Resilience	.267	.014	.145	1.273
			Sport Stress	-.275	.014	-1.225	-.144
			Age	.196	.027	.018	.287
			GPA	.274	.003	.107	.523

Note: Grade Point Average (GPA)

Discussion

The general objective of this study was to analyse how psychological and sociodemographic variables of stress and sports-academic commitment were related in a sample of adolescent judokas, paying special attention to the use of sports and academic coping strategies. The first hypothesis proposed a relationship between stress and the greater use of emotional coping strategies. The correlational analysis allowed to validate the first hypothesis since it was possible to observe a significant positive bilateral relationship between emotional coping strategies and stress. At a general level, there was a very significant relationship exclusively in the sports area. If we go into the cluster analysis, we observe that there is a significant relationship between both variables in the two areas, but only in cluster 2. It was also found a relationship between the strategies used in the sports field with the sports stress. The results of the inferential analysis went further and showed, at a general level, a positive relationship between the two areas analysed, showing that the increase in stress in one area is a predictor of an increase in the other area. The results of our study were consistent with those of González-Cabanach et al. (2018) which indicate the existence of certain relationships between avoidance strategies and increased stress levels. The cluster analysis showed that in cluster 1 there were no predictive variables of stress, neither academic or sports ones, while in cluster 2 sports stress was negatively predicted by sports emotional coping. In this cluster, academic stress was predicted by academic task coping (Aranzana et al. 2016), sex (women showed more stress) and emotional sports coping, coinciding with Jimenez et al. (2019).

The second of the hypotheses raised indicated that the coping strategies based on the task would be related to a greater commitment, while those based on emotion would do so with a lower commitment. The results of the analysis of the different variables confirmed the existence of a very significant positive correlation between the task coping strategy and commitment at the academic level and sports level. On the other hand, a very significant positive relationship was observed between task coping strategies and resilience regardless of its scope. For these reasons we can affirm that the second hypothesis is validated. The analysis of the predictive variables of commitment showed that, at a general level, the STC and the level achieved appeared as the main variables in a very significant way in the sports context, while in the academic context they were the Sport Resilience, Sport Stress, Age and GPA with a degree of significance of $p < .05$. In the cluster analysis, we observed that, for cluster 1, the athletic level was the main predictor of sporting commitment, while age was, in a very significant way, for the academic context. For cluster 2, the Sports Level and Sport Task Coping were the main indicators of Sports Commitment and Sport Resilience in the academic context at levels of $p < .05$. As a result, we can deduce the existence of a positive relationship between competitive sports practice and improvements in the academic context, coinciding with the studies of Maureira (2018) and Owen et al. (2018) among others; however, there are studies that argue that there is no relationship between academic and sports performance, such as those of Esteban-Cornejo et al. (2016) or Torbeyns et al. (2017). The relationship established between the use of task-type coping strategies and commitment, as it happens at a general level and in cluster 2, in competitors are analysed in studies such as that of Flores Moreno et al. (2017). In relation to the priority use of task-type coping strategies in the sports context, our results, in cluster 1 and, in general, showed improvements both in the sports and academic fields, generating a greater commitment in both contexts, coinciding with Carratalá (2020), although it is true that in our case they do not take them to the academic context in a direct way but indirectly since high levels of Sport Task Coping are associated with high levels of Sport Resilience and this also with high values of Academic Commitment, all associated with a lower indication of burnout and high levels of stress, in convergence with the investigations of Chen et al. (2009). A

relationship is also shown between high values of commitment with less presence of stress in the line of Carratalá et al. (2021) and this in turn with an improvement in performance (Sales Chillida et al. 2020).

In relation to the last hypothesis, the results showed the presence of two personality profiles where the individuals that compose them show psychological and sociodemographic characteristics similar to each other and different from the rest of the clusters. The cluster analysis that has been carried out consists of grouping the judokas in the sample into gatherings where their members present a certain degree of homogeneity based on the values of the set of variables and thus finding the "natural" groupings of the sample in order to find hidden subgroups not detected through discriminant analysis by variables.

Thanks to the dispersion graph of the cluster analysis, it was possible to see that in the yellow sector, made up almost entirely of judokas from cluster 1, its components presented high sports and academic commitment and low sports stress, which indicates that they do not know how to transfer task-type coping strategies carried out in the sports context to the academic environment. This sector is the object of intervention with the intention of teaching them how to transfer the strategies used in the sports field to the academic one. Despite this, within this sector is the study's reference group.

The pink sector, composed mainly of athletes from cluster 2, presented, at least in some of them, characteristics susceptible to suffering risk of academic dropout in the academic context, despite using task-type academic coping strategies, since they show high values of academic stress, they feel pressured and show low resilience. This is a group at risk of academic dropout on which an intervention should be made.

This research presents as strengths a heterogeneous and quite balanced sample, being 53.2% men (n = 59) and 46.8% women (n = 52), with ages between 11 and 19 years, (M = 14.78/ SD = 1.84) covering a wide spectrum of adolescents in non-university educational period. Another strength is the presence of different competitive levels, from regional to international. This research estate that the Processual Model of Stress (PMS) proposed by (Tobón et al., 2004) is an adequate theoretical framework to understand the internal and external predictors of stress, as well as the importance of the coping model (Lazarus & Folkman, 1986) to understand how this internal variable of the model is related to stress in the academic and sport context. The provided results support the possibility of a bidirectional transfer of the use of coping strategies between sport and academic contexts. Thus, when coping is poor in one of these contexts, it would make sense to use interventions aimed at teaching athletes to use their adaptive coping strategies in the other setting. Furthermore, when an athlete shows a non-adaptive coping pattern in both contexts, interventions could be done to improve task coping (e.g. goal setting or work planning), and minimize negative emotional coping (e.g. relaxation or focusing attention on positive aspects of the situation), with the idea that it could be used in both contexts. The analysis of coping through clusters allows the identification of groups with specific psycho-social characteristics that facilitate the joint application of strategies that help to improve the specific needs of the members of a group, whether in the academic or sporting context. As future lines of research, it is proposed to carry out this same study with the members of the national cadet and junior team, ages to which the sample corresponds, in order to know the psychological profile of the aforementioned team and make a comparison with a non-elite population. It is also proposed to make the necessary interventions, in the risk groups indicated in the discussion, in order to avoid situations of academic abandonment.

Conclusions

The main contribution of the study was to identify predictors of stress and commitment, in the sports and academic context, in adolescent judokas. At a general level, the main predictors of stress in the sports context were emotional sports coping and academic stress, while in the academic context they were sports and academic stress.

The predictive variables of sports commitment were, at a general level, sports task coping and the sport competitive level achieved, while for academic commitment the main variable was the academic record of the previous year.

The analyses carried out showed the existence of two large groups of judokas with similar characteristics allowing the identification of groups of athletes with different needs and opportunities, which could be taken into account for an adequate coaching process.

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Conflict of interests

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.