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Differential Analysis of Psychological Variables Related to the Commitment to Sport Practice in University Students During Confinement by COVID-19

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Abstract

Nowadays, psychological components have attained a very notable importance in the acquisition of healthy behaviours. Therefore, this study analyses the differences between psychological variables that are related to sports practice in university students during the confinement caused by COVID-19. The study had a sample of 1239 participants (765 males and 474 females), aged 16-45 years ($M = 21.44$, $SD = 3.94$). A questionnaire, which included the Behavioural Regulation in Sport Questionnaire (BRSQ), the Basic Psychological Needs in Exercise Scale; the Physical Activity Self-Efficacy Scale; and the Degree of Sport Commitment Scale, was used. The most relevant results show significant differences ($p < 0.01$) in favour of the male gender in almost all psychological variables except demotivation. Likewise, with regard to controlled motivation and demotivation, significant differences were found between small and large localities, with higher values in the former ($p < 0.05$ and < 0.01). The results are discussed in order to determine the differences in terms of which psychological components would allow for interventions that might be more effective in achieving regular sport practice, commitment, and adherence through the use of strategies aimed at fostering autonomous motivation in university students and counteracting the effects of controlled motivation and demotivation.

Keywords

Self-determination; self-efficacy; basic psychological need; motivation; sport.

Introduction

According to the World Health Organization (WHO, 2018), in this century, non-communicable diseases are emerging as one of the leading causes of death and one of the greatest threats to health and development in the world. Regular physical activity reduces the incidence of many of these diseases, including communicable diseases such as bacterial and viral infections, and it has even become an integral part of management regimens for various autoimmune diseases (Campbell & Turner, 2018; Sharif et al., 2018).

However, the situation of confinement caused by the 2019 coronavirus disease pandemic (COVID-19) has, among other things, reduced levels of physical activity (Amatriain-Fernandez et al., 2020; Ammar et al., 2020; Tison et al., 2020), as well as increased levels of depression, post-traumatic stress, anxiety, emotional exhaustion and irritability among others (Brooks et al., 2020). In this way, both physical and mental health have been affected, and negative changes in the healthy behavior of the population have been generated (Brooks et al., 2020; Li et al., 2020; Stanton et al., 2020; WHO, 2019).

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Analyzing various studies conducted with university students, such as those performed in Saudi Arabia, Portugal, Spain and Latin America, even before the period of confinement, worrying unhealthy lifestyles results can be found; they ranged from 35.7% to 65% of physical inactivity (Algahtani, 2020; Alves et al., 2021; Rangel et al., 2017), excessive alcohol consumption, smoking, poor diet and insufficient rest (Alvarez-Alvarez et al., 2021; Leyton-Román et al., 2021). In addition to increasing comorbidity in this population group, these lifestyles could have negative consequences during and after this period of partial confinement (Whatnall et al., 2020), especially when university age is considered a stage in which there is a greater accentuation of the decrease in the perception of known basic psychological needs (BPN), such as autonomy, competence and relationships, which are so necessary for the promotion of healthy lifestyles (Navarro-Patón et al., 2018).

During the period of confinement caused by the pandemic, a significant decrease in physical activity levels has been observed in different countries, with values ranging from 44.2% (Brancaccio et al., 2021), 47.8% (Rodríguez-Larrad et al., 2021), 54.7% (Gallè et al., 2021), 54.7% (Gallè et al., 2020) and 74.8% (López-Valenciano et al., 2021), thus possibly increasing the risk of acquiring chronic non-communicable diseases, in addition to effects on well-being, especially health-related psychological problems (Sang et al., 2021).

Psychological components have therefore gained considerable relevance in the acquisition of health-associated behaviors. For example, BPNs (autonomy, competence and social relatedness) have been shown to be predictors of the most self-determined types of motivation and could improve students' emotional aspects, and through these, their academic performance, psychological well-being and exercise adherence (Fierro-Suero et al., 2019; Kang et al., 2020; Leyton-Román et al., 2020). In fact, it is mentioned that the continuum of motivation presented by Self-Determination Theory plays a fundamental role in mediating the adoption of regular physical activity practices over time, as well as in promoting an optimal state of commitment to these practices (Deci & Ryan, 2008; McSpadden et al., 2016; O'Neil & Hodge, 2020; Pulido et al., 2018; Romero-Blanco et al., 2020; Vaquero-Solís et al., 2020).

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Another of these psychological components is self-efficacy, which according to Bandura (1997), is the belief that individuals have in themselves regarding their ability to complete a given task successfully in order to achieve a stated goal, and which can affect behavioral choices as well as subsequent outcomes (Adam & Folds, 2014).

Studies such as the one conducted by Brouwer (2020), reveal that participants with low motivation are likely to perceive that they have low self-efficacy for physical exercise, which could influence the promotion of regular practice of physical-sport activities that are beneficial to health. Conversely, self-efficacy is considered to be a determinant variable with levels of sport engagement (Zapata et al., 2021), and may also have an impact on the ability to overcome adversity (Zurita et al., 2016).

Several studies have been conducted on the implementation of physical activity programs during confinement (Bohn & Hogue, 2021; Borrega-Mouquinho et al., 2021; Fukui et al., 2021); among these we can mention the one conducted by Bartos et al. (2021) with music students, which concluded that those who were exposed to the program showed a greater commitment to health and well-being. In another study, an exercise program with online classes was used (Füzéki et al., 2021). However, despite the flexibility in the timetable, this type of program did not have the desired impact, possibly due to the lack of social interaction and the difficulty in motivating oneself. Finally, the training program applied by Sanchis-Soler et al. (2022) with sedentary university students can be reported. In this study, it was concluded that university actions based on healthy training programs could improve the level of physical activity, mental health and body composition of the participants.

However, very few studies that relate psychological variables with commitment to physical-sports practice have been developed in the context of confinement by COVID-19, such as those carried out in Spain by Angosto et al. (2020), in which they sought to identify motives and commitment to physical activity during and after this situation of confinement, or Leyton-Román & Jiménez-Castuera (2021), which analyzed which motivational variables predicted self-efficacy and commitment to sports practice.

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Comparing socio-demographic factors (gender, size of the area, dimensions of the place of confinement) and university environments (work situation) with some psychological components predictive of physical-sport practices (BPNs, motivation, self-efficacy, current and future commitment to sport practice), could allow greater effectiveness in the promotion and interventions related to physical activity, as well as in their adherence, since they could influence the behavior of students for this type of practices in their free time (Gómez-Mazorra et al., 2020; Hong et al., 2017; Kang et al., 2020; Leyton-Román et al., 2021; Leyton-Román & Jiménez-Castuera, 2021; Medrano-Ureña et al., 2020; Murillo et al., 2018; St Quinton, 2017; Zapata Lamana et al., 2021).

The study of these aspects is transcendental as they seem to influence both the persistence of an individual with a given behavior and the effort he makes (Bandura, 1997; Medrano-Ureña et al., 2020; Ruiz-Juan et al., 2018; Solomon-Moore et al., 2017; Vaquero-Solís et al., 2020), and would likely overcome the barriers of the social and constructed environment (size of the locality and place of confinement), as well as personal responsibility for a more consistent physical activity practice (Bergier et al., 2016; Gilbert et al., 2019; Liu & Dai, 2017).

The objective of this study was to determine the differences between psychological variables related to sports practice in university students during COVID-19 confinement at a higher education institution in Ecuador according to: (a) gender; (b) employment status; (c) size of the locality where they were confined; and (d) dimensions of the confinement site.

Material and method

A quantitative, descriptive, cross-sectional study was carried out.

Participants

The sample for this study consisted of 1239 university students from first to fifth year, belonging to three campuses of a co-financed university located in the three main cities of Ecuador (Guayaquil, Quito and Cuenca). Of these, 765 were male (61,7%) and 474 female (38,3%). Ages ranged from 16 to 45 years ($M = 21,44$; $SD = 3,94$).

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Procedure and instruments

This study was approved by the Research Ethics Committee of the Universidad Rey Juan Carlos under internal registration number: 2505202012420, following the guidelines of the Declaration of Helsinki. All participants were treated in accordance with the ethical guidelines of the American Psychological Association regarding participant consent, confidentiality and anonymity.

Data collection was done online with one document including the four questionnaires, using the Google Forms platform. The questionnaires were available on the online platform for a period of three months (from October to December 2020) and disseminated via mass email. The duration of the questionnaires was around 15 minutes.

The instruments used in this study are described below:

Socio-demographic variables

An ad hoc questionnaire was created to collect information related to age, gender, employment status, size of the locality and dimensions of the place of confinement.

Level of Motivation

The Behavioral Regulation in Sport Questionnaire (BRSQ) by Lonsdale et al. (2008), translated and validated in Spanish by Moreno-Murcia et al. (2011), was used. The questionnaire is composed of 36 items that make up 8 factors: intrinsic motivation towards knowledge (e.g., "For the pleasure it gives me to know more about this sport"), intrinsic motivation towards performance (e.g., "Because I enjoy trying to achieve long-term goals") and intrinsic motivation towards the stimulation (e.g., "Because of the enthusiasm I feel when I am involved in the activity"), integrated regulation (e.g., "Because it is part of who I am"), identified regulation (e.g., "Because the benefits of sport are important to me"), introjected regulation (e.g., "Because I would feel embarrassed if I quit"), external regulation (e.g., "Because others pressure me to play"), demotivation (e.g., "However, I don't know why I do it"). The previous statement was: "I do sport/training...". For this study, the grouping was made according to self-motivation (intrinsic motivation towards knowledge, performance, and

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stimulation; integrated regulation and identified regulation), controlled motivation (introjected regulation and external regulation) and demotivation (Vansteenkiste et al., 2010).

Basic Psychological Needs (BPNs)

The *Psychological Need Satisfaction in Exercise Scale (PNSE)* by Wilson et al. (2006), translated and validated in Spanish by Moreno-Murcia et al. (2011), was used. The scale is composed of 18 items that make up 3 factors: competence (e.g., "I am confident to do the most challenging exercises"), autonomy (e.g., "I believe I can make decisions in my workouts"), and relationship with others (e.g., "I feel connected to my training partners because they accept me as I am"). The previous statement was: "In my workouts...".

Self-efficacy

Bandura's (2006) Self-Efficacy Scale for physical activity practice was used. The scale is composed of 18 items that make up a single factor: self-efficacy (e.g., "When I feel tired"). The previous statement was: "I am able to maintain the training routine regularly...".

Sports Commitment

Orlick's (2004) Degree of Sport Commitment Scale, translated and validated in Spanish by Belando et al. (2012), was used. The scale is composed of 11 items that make up two factors: current commitment (e.g. "I am willing to give up other things to be better in my training") and future commitment (e.g. "I really want to become an excellent competitor in my sport"). The previous statement was: "In my training...".

The responses to the items in each of these questionnaires were given on a Likert-type scale, with a range of 1 to 5, where 1 corresponded to "strongly disagree" and 5 to "strongly agree" with the statement of the item.

Statistical analysis

First, the Kolmogorov-Smirnov and Levene test for normality and homogeneity of variance was performed, and the results obtained showed a normal distribution of the data in both tests; therefore, parametric statistics were applied.

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A descriptive analysis was performed to obtain the mean and standard deviation of the variables measured. For the reliability analysis, Cronbach's alpha index was used (α), with a value equal to or greater than 0,70 (Nunnally, 1978).

Subsequently, the identifying variables were coded. These were gender (male and female); employment status (coded according to whether the participants were students or students and workers); size of the locality (less than and more than 100 000 inhabitants); and dimensions of the confinement site (less than 60 m², 61 to 80 m², 81 to 120 m², and more than 120 m²). An ANOVA analysis of variance for independent groups of one factor was performed for differences between groups according to gender, employment status and size of the locality. The Bonferroni post hoc multiple comparisons test was also used for the groups according to the dimensions of the place of confinement. A p-value <0,05 was considered significant.

All statistical analyses were performed using SPSS 23.0 software.

Results

Descriptive analysis

The mean and standard deviation of the variables measured were determined. The highest mean value was obtained for the self-motivation variable, while the lowest value corresponds to the lack of motivation to practice physical activity (Table 1).

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Table 1. Descriptive Analysis.

	Range	M	SD	α
<i>BRSQ</i>				
Self Motivation	1-5	4,08	0,94	0,96
Controlled Motivation	1-5	2,83	1,05	0,85
Demotivation	1-5	2,43	1,30	0,91
<i>PNSE</i>				
BPN Autonomy	1-5	3,79	0,96	0,90
BPN Competence	1-5	4,05	0,96	0,95
BPN Relationships	1-5	3,67	0,98	0,87
<i>SELF-EFFICACY</i>				
Self-Efficacy	1-5	3,63	0,89	0,96
<i>SPORTS COMMITMENT</i>				
Current Commitment	1-5	3,94	0,87	0,90
Future Commitment	1-5	3,90	0,88	0,86

Note. *M* = Mean; *SD* = Standard Deviation; BPN = Basic Psychological Need; α = Cronbach's Alpha

Differential analysis

In relation to the gender variable, the results revealed significant differences in favor of males in terms of levels of both self and controlled motivation, higher levels of self-efficacy and of the three BPNs, as well as in terms of current and future commitment to sports practice (Table 2).

Tabla 2. Gender Differences.

	Male		Female		<i>p</i>	Root Mean Square	F
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Self Motivation	4,18	0,88	3,93	1,00	<0,01	10,75	12,38
Controlled Motivation	2,91	1,31	2,71	1,06	<0,01	6,87	6,24
Demotivation	2,46	1,31	2,39	1,29	0,24	2,44	1,44
BPN Autonomy	3,87	0,94	3,66	0,98	<0,01	8,34	9,09
BPN Competence	4,17	0,89	3,85	1,03	<0,01	16,87	18,81
BPN Relationships	3,77	0,94	3,53	1,02	<0,01	10,15	10,71
Self-Efficacy	4,04	0,95	3,40	0,95	<0,01	20,70	27,23

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Current Commitment	4,04	0,83	3,78	0,92	<0,01	9,40	12,65
Future Commitment	4,03	0,89	3,73	1,00	<0,01	13,34	15,33

Note. *M* = Mean; *SD* = Standard Deviation; BPN = Basic Psychological Need

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Regarding the work situation variable, the results show significant differences in self and controlled motivation, the three NPBs and in the perception of self-efficacy, favoring participants who study and work compared to those who only study (Table 3).

Table 3. *Differences by employment status.*

	Students		Students and worker		<i>p</i>	Root Mean Square	F
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Self Motivation	4,04	0,96	4,23	0,87	0,02	4,23	4,81
Controlled Motivation	2,78	1,03	3,02	1,11	<0,01	6,22	5,65
Demotivation	2,39	1,27	2,56	1,41	0,18	2,88	1,70
BPN Autonomy	3,73	0,98	3,99	0,88	<0,01	7,23	7,86
BPN Competence	4,00	0,97	4,21	0,89	<0,01	5,05	5,52
BPN Relationships	3,63	1,01	3,85	0,85	0,01	4,96	5,19
Self-Efficacy	3,58	0,89	3,79	0,88	<0,01	4,92	6,26
Current Commitment	3,92	0,87	4,02	0,87	0,27	0,99	1,31
Future Commitment	3,89	0,95	4,00	0,93	0,25	1,25	1,40

Note. *M* = Mean; *SD* = Standard Deviation; BPN = Basic Psychological Need.

Regarding the variable of size of the confinement location, the results show significant differences in terms of controlled motivation and demotivation in favor of localities with less than 100,000 inhabitants (Table 4).

Table 4. *Differences according to the size of the locality.*

	Less than 100 000 inhabitants		More than 100 000 inhabitants		<i>p</i>	Root Mean Square	F
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Self Motivation	4,09	0,93	4,11	0,95	0,76	0,86	0,10
Controlled Motivation	2,88	1,08	2,71	0,97	0,01	6,78	6,15
Demotivation	2,49	1,33	2,25	1,23	<0,01	13,87	8,19
BPN Autonomy	3,78	0,98	3,82	0,93	0,50	0,43	0,46
BPN Competence	4,05	0,95	4,06	0,95	0,91	0,01	0,01
BPN Relationships	3,68	0,99	3,68	0,96	0,98	0,00	0,00
Self-Efficacy	3,63	0,90	3,64	0,86	0,91	0,10	0,13
Current Commitment	3,93	0,89	3,99	0,82	0,21	1,19	1,57
Future Commitment	3,91	0,91	3,94	0,91	0,60	0,24	0,27

Note. *M* = Mean; *SD* = Standard Deviation; BPN = Basic Psychological Need

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Meanwhile, according to the dimensions of the confinement location variable, the results show significant differences in terms of controlled motivation and demotivation in favor of smaller confinement locations, i.e., with less than 60 m² of dimension (Table 5).

Table 5. Post-hoc ANOVA of differences as a function of the dimensions of the confinement location.

	Less than 60 m ²		61 to 80 m ²		81 to 120 m ²		More than 120 m ²		<i>p</i>	Root Mean Square	F
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Self Motivation	4,08	0,88	4,11	0,90	4,02	1,01	4,11	0,98	0,60	0,55	0,62
Controlled Motivation	3,01	1,07*	2,77	1,01*	2,80	1,07	2,83	1,08	0,05	2,98	2,70
Demotivation	2,63	1,32*	2,34	1,24*	2,38	1,35	2,48	1,33	0,03	4,94	2,92
BPN Autonomy	3,80	0,89	3,79	0,95	3,78	0,99	3,79	1,03	1,00	0,01	0,01
BPN Competence	4,06	0,92	4,07	0,94	4,03	0,96	4,02	1,04	0,90	0,18	0,19
BPN Relationships	3,75	0,91	3,68	0,97	3,61	1,02	3,68	1,01	0,40	0,96	0,99
Self-Efficacy	3,65	0,89	3,61	0,87	3,63	0,89	3,62	0,93	0,96	0,08	0,10
Current Commitment	3,97	0,87	3,96	0,82	3,93	0,90	3,91	0,92	0,85	0,20	0,27
Future Commitment	3,95	0,93	3,91	0,92	3,90	0,95	3,89	1,00	0,94	0,12	0,14

Note. (*) *p* < 0,05, indicate between which groups there are significant differences; *M* = Mean; *SD* = Standard Deviation; m² = square meters; BPN=Basic Psychological Need

Discussion

The restrictions caused by COVID-19 have generated a negative impact on the psychological, social, physical, sporting and general health (Ammar et al., 2020; Brooks et al., 2020, 2020; Leyton-Román & Jiménez-Castuera, 2021; Li et al., 2020; Stanton et al., 2020). However, it is mentioned that physical exercise programs performed in the framework of healthy actions within universities can be considered as suitable options for the improvement and maintenance of different healthy lifestyles of post-pandemic university students (Sanchis-Soler et al., 2022).

Considering this situation, the study of the psychological components that influence the commitment to current and future sports practice represents an aspect to be considered of transcendental importance in post-confinement intervention programs (Adam & Folds, 2014; Fierro-Suero et al., 2019; Kang et al., 2020; Leyton-Román & Jiménez-Castuera, 2021).

The results of this study show that the participating university students present the highest values in their self-motivation. This is very encouraging because this type of

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motivation would allow university students to engage in sports practice with full sense of disposition, willingness and choice, as well as allowing them to perform, learn and adapt better to the physical-sports activities proposed (Deci et al., 2017).

Another of the components that presents high values in this study is the BPN of competence, which according to Deci et al. (2017) together with the other two BPNs (autonomy and relation) come to be mediators for the acquisition of healthy behaviors and well-being in different contexts. In addition, they represent mediators that influence intrinsic motivation, i.e., performing physical-sport activities for the pleasure derived from their execution (Stover et al., 2017), as well as the intention to be physically active and sport commitment (Deci et al., 2017; Kang et al., 2020; Salazar-Ayala & Gastélum-Cuadras, 2020).

These results are similar to those found with a Spanish population aged between 18 and 65 years in the context of the confinement produced by COVID-19 (Leyton-Román et al., 2021), although in terms of demotivation, university students show more favorable values (2.43 versus 1.60).

Regarding the differential analysis, which was the main objective of this study, the results reveal that there are significant differences with respect to gender. As a matter of fact, males present higher values in almost all the psychological components studied, except for demotivation. Possibly, this is due to the fact that female students perceive that physical exercise programs or sports practices include more activities intended for males than for them (Navarro-Patón et al., 2018). In addition, the motives for engaging in physical-sports practices are different according to gender, since females tend to have external motives (weight control, physical appearance, interpersonal relationships), that is, tending more towards extrinsic motivation or demotivation (Práxedes et al., 2016), or possibly due to the perception of greater barriers to the practice of physical exercise that females regularly have (Angosto et al., 2020; Gómez-Mazorra et al., 2020).

This is of vital importance for the planning of interventions because it would allow obtaining a clearer idea about the population group that requires greater attention when selecting activities or workouts, since it is presented as the group with the lowest degree of commitment to sports practice (Angosto et al., 2020).

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When comparing these results with those of other studies, it is observed that they are similar to those found by Navarro-Patón et al. (2018) where males presented higher values than females in the three BPNs. In contrast, it differs from the research conducted by Leyton-Román et al. (2021) regarding the variables: self-motivation, BPN of competence, BPN of relationship, current commitment and future commitment to sport practice, where no significant differences by gender were found.

Regarding the results related to the participants' university environment (work situation), this study shows that there are significant differences in favor of those who studied and worked at the same time during the confinement period. These results are of utmost importance because they would evidence that they know how to adequately distribute their time, discarding this aspect as one of the barriers to leisure time sports practice as evidenced in other studies mentioned by Angosto et al. (2020) and Gómez-Mazorra et al. (2020).

This is partially similar to the results found by Leyton-Román & Jiménez-Castuera (2021), since significant differences were only established between these two groups in self-motivation.

Another contextual aspect that was analyzed in this study was the size of the locality in which the participants were confined during the COVID-19 pandemic. Significant differences were found between areas with more than 100,000 inhabitants and those with less than 100,000 inhabitants, with the impact on controlled motivation and demotivation being higher. Considering that these two psychological components are known as negative predictors of intention to be physically active and persistence in the practice of physical-sports activities (Gómez-Mazorra et al., 2020; Leyton-Román et al., 2021; Ryan & Deci, 2020), intervention programs should be focused on influencing integrated motivation, greater BPN satisfaction and promotion of self-efficacy of university students, especially those who live in or come from communities considered small.

A similar situation has been presented in relation to the dimensions of the place of confinement. The present study has shown that the smaller these dimensions are, the higher the values in terms of controlled motivation and demotivation towards the practice of physical activity, which is detrimental to the interests related to the promotion of the regular practice of physical activity and its adherence.

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Finally, as main limitations it can be mentioned that this study was cross-sectional in nature; therefore, it is important to perform a longitudinal follow-up in future research. In addition, physical activity levels were not evaluated, which would have provided very important information to relate to the variables studied. Likewise, it would have been of special interest to use other types of qualitative instruments that would help to gain a deeper understanding of the phenomenon, such as interviews or focus groups with the university population. However, these results provide relevant and novel information for the practical field, as it would allow more effective interventions to be proposed for the promotion of sports practices in this population group and, above all, for them to last over time. Furthermore, it would facilitate the combination of strategies that support the different psychological components as mediators of the regular practice of physical activity at university level. Finally, another contribution of this study is that it could serve as a precedent for research with other population groups such as schoolchildren or adolescents.

Conclusions

Determining the differences in the psychological components and sociodemographic factors of university students would contribute to the development of more effective interventions to achieve the regular practice of sports activities, as well as their commitment and adherence, and thus have a positive influence on the mental and physical health of university students after the period of confinement.

This study managed to identify that the context, in which the confinement takes place, exerts a negative influence on motivation; a fact that should be considered at the time of proposing interventions.

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