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Physical fitness, indicator of healthy pre-adolescent development
La aptitud física, indicador de un desarrollo saludable en el preadolescente

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Abstract. Physical fitness (PF) is an important indicator in the healthy development of pre-adolescent children, in this sense, working on PF is essential to generate a positive self-perception of it. The aim of this study is to (1) analyze the self-reported PF of third cycle primary school students, (2) study whether there are significant differences depending on the location of the school and the sex of the participants, and (3) investigate the correlations between the items that make up the FP VAS scale and age. The sample consisted of a total of 522 participants (10-12 years old), 46% boys and 54% girls % of 5º and 6º primary education, where 46.4% studied in rural schools and 53.4% in urban schools. The Fitness Perception Visual Analogue Scale for Adolescents (FP VAS A) was used to assess self-reported PF. There were statistically significant differences between sexes ($p<0.001$), with boys showing higher scores than girls in all items of the FP VAS A scale, with the exception of global flexibility. Students from rural centers, with respect to their peers from urban centers, also showed significantly higher scores ($p<0.001$) in all items of the FP VAS A scale. There was no correlation between self-perceived PF and age. In conclusion, the self-perception of PF and its control with this type of instrument could help pre-adolescents to adopt active and healthy lifestyle habits to improve their perception of PF
Keywords: physical fitness; pre- adolescents; early adolescence; self-perception.

Resumen. La condición física (FP) es un indicador importante en el desarrollo saludable de los niños preadolescentes, en este sentido, trabajar la FP es fundamental para generar una autopercepción positiva de la misma. El objetivo de este estudio es (1) analizar la FP autoreportada de alumnos de tercer ciclo de primaria, (2) estudiar si existen diferencias significativas en función de la localización del centro y del sexo de los participantes, y (3) investigar las correlaciones entre los ítems que componen la escala FP VAS y la edad. La muestra estuvo compuesta por un total de 522 participantes (10-12 años), 46% niños y 54% niñas % de 5º y 6º de educación primaria, donde el 46,4% estudió en escuelas rurales y el 53,4% en escuelas urbanas. Se utilizó la Escala Visual Analógica de Percepción de la Aptitud Física para Adolescentes (FP VAS A) para evaluar la PF autoinformada. Hubo diferencias estadísticamente significativas entre sexos ($p<0,001$), mostrando los niños puntuaciones más altas que las niñas en todos los ítems de la escala FP VAS A, a excepción de la flexibilidad global. Los estudiantes de centros rurales, con respecto a sus pares de centros urbanos, también mostraron puntuaciones significativamente más altas ($p<0,001$) en todos los ítems de la escala FP VAS A. No hubo correlación entre la PF autopercibida y la edad. En conclusión, la autopercepción de la FP y su control con este tipo de instrumentos podría ayudar a los preadolescentes a adoptar hábitos de vida activos y saludables para mejorar su percepción de la FP.
Palabras clave: aptitud física; preadolescentes; adolescencia temprana; autopercepción.

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Introduction

Physical inactivity has been one of the major public health problems of the 21st century (Blair, 2009) and, according to the World Health Organization report, it is the fourth leading risk factor for mortality (World Health Organization, 2022). Globally, 81 % of adolescents aged 11-17 years did not engage in sufficient physical activity (PA) in 2016, due this high prevalence to passive and sedentary behaviors during leisure time and the use of passive modes of transport when travelling (World Health Organization, 2022). So, predominant idea of researchers and health and education professionals, has been inadequate PA levels in childhood, decrease even more drastically during the adolescent period (Varma et al., 2017). On the other hand, the benefits of regular PA among children and adolescents are more than demonstrated, with improvements in body composition, cardiorespiratory and muscular fitness, bone health and biomarkers of metabolic health (Kline et al., 2021).

In this sense, it would be interesting to talk about physical fitness (PF) concept's, It's the body's ability to perform various types of PA effectively and efficiently, consisting mainly of capabilities such as strength, cardiorespiratory endurance, speed-agility and flexibility (Ortega et al., 2007). PF is one of the most relevant markers of children and adolescent health (Ortega, Ruiz, Castillo, & Sjöström, 2008) and it is an important indicator in the healthy development of children (Smith et al., 2019), moreover, it is influenced by environmental, genetic and lifestyle factors, being the practice of PA very influential in this last factor (Tabacchi et al., 2018). According to several studies, fitness work is associated with better academic performance (Lima et al., 2018), higher quality of life (Kalantari & Esmaeilzadeh, 2016) and lower risk of depression in adolescence (Lukács et al., 2020).

Adolescence is a crucial life stage in the formation of lifestyles and the establishment of healthy habits that will have an impact on health and health-related quality of life later in the life cycle (Baceviciene et al., 2019). Regular practice PA and PF work during adolescence are considered indispensable pillars to guarantee physical, mental and social wellbeing in later stages of life (True et al., 2021). In contrast, physical inactivity, sedentary habits and low fitness levels during adolescence could increase the risk of cardiovascular pathologies (Carnethon et al., 2005), develop type 2 diabetes (Crump et al., 2016) and was associated with an increased risk of all-cause mortality

(Högström et al., 2014) in adulthood and old age.

To combat physical inactivity, it is necessary for childhood and adolescence to have a positive prior experience towards PA itself and, the perception and control of their own physical capabilities can be a valuable and useful tool (Christiansen et al., 2018). In addition, public health agencies give priority to the evaluation of PF from early stages, due to the relationship established between PF and the health status of the person (García-Hermoso et al., 2022; True et al., 2021). In the school context, the most commonly used means to evaluate PF objectively are field tests combined with the use of specific devices and instruments to measure the different physical abilities, obtaining practically accurate results (Ortega, Artero, et al., 2011; Ramírez-Vélez et al., 2015). Field tests such as the PA Level Assessment Battery (ALPHA-Fitness) (Ruiz et al., 2011), have demonstrated their internal consistency and validity for students to know and control the PF values of different abilities (España-Romero et al., 2010). However, the execution of all these tests by all the students that make up a Physical Education class may require a great amount of time, as well as the availability of the necessary space and material to be performed correctly (Mendoza-Muñoz et al., 2021; Ortega, Ruiz, et al., 2011).

Self-reported fitness questionnaires or scales can be a more than interesting alternative, since their completion requires little time on the part of the users and all members of a class can complete them simultaneously from their seats or from wherever they are (Ortega, Ruiz, et al., 2011). In addition, positive adolescent self-reported PF has been shown to have a direct relationship with increased PA or a higher level of PA, having a positive impact on adolescent health and well-being (Ortega, Ruiz, et al., 2011; Pastor-Cisneros et al., 2021; Shi et al., 2022). The instrument that has been most widely used to assess self-perception of PF is the International Fitness Scale (IFIS) (Ortega, Ruiz, et al., 2011), a tool that has proven to be valid and reliable, translated into several languages and used in several studies with South American(De Moraes et al., 2019; Ramírez-Vélez et al., 2017; Sánchez-Toledo et al., 2017), European (Ortega, Ruiz, et al., 2011; Sánchez-López et al., 2015) and Asian (Shi et al., 2022) children and adolescents. There are some instruments that fulfil a similar function to the IFIS scale, measuring the same physical capacities, such as the self-perception of PF questionnaire of Delignières et al. (Delignières et al., 1994), slightly modified by Jürimäe et al. (Jürimäe & Saar, 2003). Recently, the Fitness Perception Visual Analogue Scale for Adolescents (FP VAS A) has been designed, a scale that has shown validity and internal consistency (Mendoza-Muñoz et al., 2021), evaluating the same physical capacities as the IFIS scale, however, in each item a visual analogue scale (VAS) from 1 to 10 is used, instead of a 5-Likert scale as the IFIS scale uses.

The FP VAS A scale will be the instrument to be used in this research, and there are few studies that have used it for data collection, apart from the study where its internal consistency and validity were analyzed (Mendoza-Muñoz et al., 2021). A study by Pastor-Cisneros et al. uses this FP VAS scale to analyze the relationship between physical literacy and self-perceived fitness level in children and adolescents (Pastor-Cisneros et al., 2021). In this study and others, self-perception of PF has been compared secondarily between boys and girls, with boys showing a more positive self-perception of PF than girls for all abilities except flexibility (Palacios-Cartagena et al., 2022; Pastor-Cisneros et al., 2021; Ruiz-Montero et al., 2020). In addition, there are not too many studies that analyze sex differences for self-perception of PF that only cover the beginning of adolescence (10-13 years), end of primary education, and if they exist, they have employed the IFIS scale, as is the case of the research by Sánchez-López et al. in Spanish students aged 9 to 12 years (Sánchez-López et al., 2015). There is also hardly any scientific evidence on the influence that the type of school, rural or urban, may have on students' self-perception of PF, and sociocultural and economic factors may influence this, as several studies showed that urban children were less active than rural children, a fact possibly influenced by these factors (Joens-Matre et al., 2008; Liu et al., 2008; Loucaides et al., 2004; Springer et al., 2006). There is little evidence and little consensus in relation to the environment where children reside. There is a study from 2019 (Álvarez & Rangel-Caballero, 2019) where no significant differences in the components of physical fitness were found with respect to the place where they live. But it did find that urban children tend to be more physically active than rural children. Another study from 2017 suggests that schoolchildren living in urban areas have a better physical fitness status, as well as a higher body mass index than schoolchildren from rural areas (Guillamón, Cantó, & Soto, 2017). However, older studies (Cumbreras, Sánchez, Sánchez, & Torres-Luque, 2014; De la Cruz-Sánchez et al., 2012; Torres-Luque et al., 2014) reported that the rural population has better findings in physical fitness.

Therefore, the aim of this study was to analyze the self-reported PF of elementary school students using the items of the FP VAS A scale and to study whether there are significant differences depending on the location of the school and the sex of the participants. The correlation between the items that make up the FP VAS scale and age will also be investigated. So, hypotheses put forward are: (1) Boys have more PF than girls, (2) Pupils in rural schools have more PF than pupils in urban schools, and (3) there is an inverse correlation between PF and age.

Materials and methods

Participants

A non-probability sampling method based on convenience sampling was used to select the sample size (Salkind et al., 1999). The total sample (n=522) was made up of 46% boys and 54% girls, so it can be said that the sample was balanced in relation to the sex of the

participants. Regarding the location of the school where the participants studied, 53.4% of the total sample was studying in urban centers and 46.6% in rural centers. Centers located in towns with more than 20,000 inhabitants were classified as urban centers and those located in towns with less than 20,000 inhabitants as rural centers. This categorization was based on the criteria established by the Cáceres Provincial Council (https://www.dip-caceres.es/).

For this study, the following inclusion criteria were established for the participants: (1) having an informed consent signed by the parent or guardian authorizing the student's participation in the research, (2) being a student in the area of Physical Education in a public primary school in Extremadura, an autonomous community of Spain.

Procedure

Thanks to the directory of public schools in Extremadura provided by the Ministry of Education and Employment of the Extremadura Regional Government, we searched for and selected the contact information of the schools that teach Primary Education (6 to 12 years old).

For all the selected centers, an e-mail was sent to the Physical Education teachers of those centers, providing them with information regarding the object of the study, the informed consent to be submitted by the students who wished to participate, and attaching a model of the instrument to be used for this study. In the event that the teacher offered to collaborate in the research, he/she had to make an appointment via e-mail so that a member of the research team could come to the school to distribute the questionnaires that the students in the Physical Education class had to fill out for this study. Only students who had submitted informed consent could complete the questionnaires; therefore, the researcher had to verify that the parents or guardians authorized the student to participate in the study. A Tablet was provided to each student with a URL link to the questionnaire, a questionnaire elaborated with the digital application Google Forms. The researcher read aloud the various items on the questionnaire, making sure that the participants understood each item and had no doubts. The decision to use an e-questionnaire was made to save time and costs by storing all responses easily and simply in a single database.

Data were collected anonymously and kept private. This study was performed in accordance with the guidelines of the Declaration of Helsinki. and was approved by the Bioethics and Biosafety Committee of the University of Extremadura (protocol code: 71//2022).

Instruments

Sociodemographic data: A questionnaire was designed with four questions to characterize the sample (sex, age, grade and location of the center).

Fitness Perception Visual Analogue Scale for Adolescents (FP VAS A): This scale was used to assess self-reported PF (Mendoza-Muñoz et al., 2021). The scale is composed of five items (overall physical fitness, cardiorespiratory endurance, muscular strength, speed-agility and flexibility). VAS scale 1-10

Statistical Analysis

First, the distribution of the data was studied using the Kolmogorov-Smirnov test and the assumption of normality was checked to determine the type of statistical tests to be used. The assumption of normality was not met; therefore, nonparametric statistical tests were used.

The Mann Whitney U test was used to analyze the differences in scores for each of the variables studied as a function of center location and as a function of sex. The significance level was set at $p<0.05$.

Spearman's Rho test was used to determine the degree of relationship between each variable and age. According to the ranges established by Mondragón Barrera to interpret this statistic, the existence of a low correlation for coefficients between 0.01 and 0.10, a medium correlation for values between 0.11 and 0.50, a strong correlation from 0.51 to 0.75, a high correlation for values from 0.76 to 0.90 and a perfect correlation for values above 0.91 was established (Barrera, 2014).

Hedges' g was used to calculate the effect size of sex or center location for each of the variables studied. The following effects were determined: For values below 0.20 no effect was indicated, for coefficients between 0.21 and 0.49 a small effect was indicated, for values between 0.50 and 0.79 a moderate effect and for values above 0.80 a strong effect was determined (Cohen, 2013).

The internal consistency of the instrument was determined from Cronbach's alpha. The degree of internal consistency was interpreted on the basis of the reference values established by Nunnally and Bernstein: low internal consistency was determined for values below 0.70, satisfactory internal consistency for values between 0.71 and 0.90 and excellent internal consistency for values above 0.91 (Nunnally & Bernstein, 1994).

For the sociodemographic variables, the data are shown in terms of number and percentage of the total. For the scores obtained for the items of the FP VAS A scale, the data were presented as Mean (M) and Standard Deviation (SD). The Statical Package of Social Science (SPSS) version 23 for MAC was used to perform the data analysis.

Results

Table 1 shows the sociodemographic characterization of the sample according to age, sex, grade academic and school location.

Table 2 shows the descriptive data and the differences for each of the FP VAS A items according to sex and center location. The overall score of the FP VAS A scale is shown at the end, after the five items that make up the scale, also showing the differences according to sex and center location.

Boys obtained higher scores than girls for all items

(p<0.001) of the FP VAS A scale, showing a better self-perception of PF than girls in all items, except for the variable "My overall flexibility is", where girls obtained a slightly higher score. The differences were statistically significant for all items except for the flexibility item. Statistically significant differences were also shown for the overall scale score, with boys showing a higher overall FP VAS A scale score (p<0.001) than girls.

Hedges´g was used to calculate the effect size. For values below 0.20 no effect was indicated, for coefficients between 0.21 and 0.49 a small effect was indicated, for values between 0.50 and 0.79 a moderate effect and for values above 0.80 a strong effect was determined

Table 3 shows regarding school location, students who were studying in rural schools showed a better self-perception of PF in all items of the FP VAS A scale and in the overall score of the scale, since the scores obtained by students in rural schools were higher than those of students in rural schools. The differences were statistically significant for all items and for the overall FP VAS A scale score.

Table 4 shows the correlations between FP VAS A scale items and age, through Spearman's Rho test. No significant correlations were obtained for any item of the FP VAS A scale and age, nor for the overall scale score and age

Cronbach's alpha was used to calculate the internal consistency of the instrument, obtaining a value of 0.87, a satisfactory value according to the references established by Nunnally and Bernstein (Nunnally & Bernstein, 1994).

Table 1.
Sample characterization (N=522).

Variable	Categories	N	%
Sex	Boy	240	46
	Girl	282	54
Grade (Primary education)	5th grade	217	41.6
	6th grade	305	58.4
Center Location	Rural	243	46.6
	Urban	279	53.4
Variable		M	SD
Age		11.52	0.88

N: number; %: percentage; SD: standard deviation; M: Mean.

Table 2.
Scores and differences obtained according to sex of the items of the FP VAS A

Item	Sex			
	Boy	Girl		
	M (SD)	M (SD)	p	g
1. My overall physical fitness is:	7.89 (1.31)	6.30 (2.26)	<0.001*	0.841
2. My cardiorespiratory endurance (ability to do physical activities for a long time) is:	8.13 (1.53)	6.29 (2.50)	<0.001*	0.870
3. My overall muscle strength is:	7.71 (1.37)	6.20 (2.23)	<0.001*	0.798
4. My movement speed (the ability to run very fast) is:	8.43 (1.23)	6.27 (2.19)	<0.001*	0.987
5. My overall flexibility is:	5.70 (2.29)	5.77 (2.59)	0.554	0.028
Visual Analogue Fitness Perception Scale for Adolescents (FP VAS A)	7.75 (1.08)	6.16 (1.76)	<0.01*	0.944

Note: p is significant < 0.05*. M = mean value; SD = Standard deviation; g= effect size Hedges Each score obtained on the VAS PFA is based on a VAS scale (1–10)

Table 3.
Scores obtained according to centre location of the items of the FP VAS A

Item	Centre Location			
	Rural	Urban		
	M (SD)	M (SD)	p	g
1. My overall physical fitness is:	8.15 (1.34)	6.06 (2.05)	<0.001*	<0.001*
2. My cardiorespiratory endurance (ability to do physical activities for a long time) is:	8.28 (1.52)	6.14 (2.40)	<0.001*	<0.001*
3. My overall muscle strength is:	7.59 (1.52)	6.28 (2.21)	<0.001*	<0.001*
4. My movement speed (the ability to run very fast) is:	8.09 (1.55)	6.55 (2.27)	<0.001*	<0.001*
5. My overall flexibility is:	6.28 (2.36)	5.27 (2.44)	<0.001*	<0.001*
Visual Analogue Fitness Perception Scale for Adolescents (FP VAS A)	7.67 (1.06)	6.05 (1.69)	<0.001*	<0.001*

Note: p is significant < 0.05*. M = mean value; SD = Standard deviation; g= effect size Hedges Each score obtained on the FP VAS A is based on a VAS scale (1–10)

Table 4.
Correlations between FP VAS A variables and age.

Dimensions	Age ρ (p)
1. My overall physical fitness is:	-0.014 (0.751)
2. My cardiorespiratory endurance (ability to do physical activities for a long time) is:	-0.053 (0.225)
3. My overall muscle strength is:	0.003 (0.952)
4. My movement speed (the ability to run very fast) is:	-0.027 (0.534)
5. My overall flexibility is:	-0.018 (0.679)
Visual Analogue Fitness Perception Scale for Adolescents (FP VAS A)	-0.041 (0.351)

Each score obtained on the FP VAS A is based on a VAS scale (1–10).

Discussion

Among the main findings of this research, boys presented a better self-perception of PF than girls for all abilities except for the self-perception of flexibility, where the differences between boys and girls were not statistically significant. In relation to the location of the center, the scores obtained by students from rural centers were higher than those of students from urban centers in all the items of the FP VAS A scale, these differences being statistically significant. Therefore, students in rural centers showed a better self-perception of PF, in general and for all abilities, than students in urban centers. In addition, the correlations between the items of the FP VAS A scale and age were not significant, therefore, it can be affirmed that there was no relationship between self-perceived PF and age, probably because the sample was too homogeneous (M=11.52; SD=0.88).

In this study, the results showed how the self-perception of PF was more positive in boys than in girls for all physical abilities, with the exception of flexibility where the differences were not significant, being the scores obtained in the self-perception of this physical ability very similar between boys and girls. These results are consistent with those of other research (Castro-Sánchez et al., 2021; Huotari et al., 2009; Jürimäe & Saar, 2003; Mendoza-Muñoz et al., 2021; Ortega, Ruiz, et al., 2011; Palacios-Cartagena et al., 2022; Sánchez-López et al., 2015), where boys obtained higher scores and, therefore, more positive self-perceptions in general PF and in all physical capacities

except flexibility, where either no significant differences were observed according to sex as happened in this research, or girls showed a better self-perception of flexibility. Flexibility, as a physical capacity, could be erroneously self-perceived in adolescents, being a capacity that decreases, especially in boys, during adolescence if it is not constantly trained (De Moraes et al., 2019). The ignorance of some adolescents of the global concept of flexibility may be related to this fact, assuming that flexibility is based on the adoption of certain postures or extreme movements, rather than to the ability of joints and muscles to mobilize through their full range (Sands & McNeal, 2013).. In relation to the latter, some studies suggest that adolescents report their health status and general PF taking muscular strength and cardiorespiratory endurance as a reference, since the correlation between perceived health condition and self-perceived flexibility was not significant (Bermejo-Cantarero et al., 2021; Marques et al., 2017; Shi et al., 2022).

This less positive self-perception of their PF, by girls compared to boys, could be related to less PA practice and a lower level of PF, as it has been shown in other research that there is a direct correlation between self-perceived PF with the level of PA (Fernández Álvarez et al., 2020; Haugen et al., 2013; Malete et al., 2008; Palacios-Cartagena et al., 2022) and with the level of PF (Mendoza-Muñoz et al., 2021; Ortega, Ruiz, et al., 2011). Along these lines, a rapid decrease in PA with age has been reported, especially in girls (KIMM et al., 2000; Kimm et al., 2002). According to scientific evidence, boys are more motivated than girls to engage in physical exercise (Portela-Pino et al., 2019; Smith et al., 2014) with orientations focused on ego, challenge, strength and endurance, and competition (Montero et al., 2014; Portela-Pino et al., 2019), with girls spending more time on sedentary activities and presenting more barriers to PA (Pauline, 2013; Portela-Pino et al., 2019). Differences in FP self-perception could be associated with physical self-concept, with boys perceiving themselves more positively in the five physical competencies related to physical self-perception established by Fox et al: PF, sports competence, attractive body, physical strength, and self-confidence (Fox & Corbin, 1989). In the study by Crocker et al. demonstrated a weak association for adolescent girls between perception of physical strength and physical self-esteem (Crocker et al., 2006) and other studies claim that boys experience greater perception of physical strength because they have a stronger physical self-perception (Carraro et al., 2010; Mayorga et al., 2012; Ruiz-Montero et al., 2020). Another possible justification could be due to the fact that girls, in the earlier stages of adolescence, may try to hide their changes in PA and physical level, considering them unattractive (Ruiz-Montero et al., 2020; Vermeir & Van de Sompel, 2014), which could have a negative impact on their self-perception of PF.

In relation to the location of the center, students from rural centers showed a better self-perception of PF for all physical abilities than students from urban centers, with students from rural centers obtaining quite high scores in most of the self-perceived physical abilities, with the exception of flexibility. This better self-perception of PF could be due to a higher level of PF or a higher level of PA on the part of the rural student with respect to the urban student, since, as has been proven in other studies, there is a direct correlation between self-perceived PF with the level of PA (Fernández Álvarez et al., 2020; Haugen et al., 2013; Malete et al., 2008; Palacios-Cartagena et al., 2022) and with the level of PF (Mendoza-Muñoz et al., 2021; Ortega, Ruiz, et al., 2011). Along these lines, a large number of studies support these results, reporting that rural adolescents had a higher level of PA than their urban counterparts (Joens-Matre et al., 2008; Liu et al., 2008; Loucaides et al., 2004; Springer et al., 2006), with the study by Liu et al. finding that U.S. urban adolescents were more likely to be inactive than rural adolescents (Liu et al., 2008). In the case of PF and the different physical capacities that comprise it, a large number of studies also reaffirm the data obtained from this research, with adolescents from rural areas showing a better anthropometric profile, cardiorespiratory fitness, speed-agility, muscular strength and, in general, better PF than their peers from urban areas (Adamo et al., 2011; Albarwani et al., 2009; Dollman et al., 2002; Sylejmani et al., 2019; Tambalis et al., 2011). However, there are also contradictory results shown in other studies with respect to those of this research, where urban adolescents demonstrated a greater practice of moderate to vigorous PA than rural adolescents (Davis et al., 2008; Moore et al., 2013). The same occurs with PF, in some research urban adolescents performed better in the different abilities that make up PF than rural adolescents by showing better scores in PF tests (Andrade et al., 2014; Eiben et al., 2005; Hian et al., 2013; Peña Reyes et al., 2003), findings contrary to those presented in this study. Moreover, as in the study by Chillón et al. in Spanish adolescents, it is also possible that rural adolescents have better PF capacities (cardiorespiratory endurance and strength) and urban adolescents have other capacities (speed-agility and flexibility) (Chillón et al., 2011).

Therefore, according to the literature, the differences between urban and rural adolescents in terms of PF and self-perception remain speculative and are not entirely clear. Firstly, the results may be influenced by the height and weight of the adolescents themselves, having an advantage in abilities such as strength, speed and endurance which could have an impact on their self-perception (Malina et al., 2004). In urban areas, adolescents may have greater access to a greater number and variety of sports facilities than in rural areas (Davison & Lawson, 2006; Hian et al., 2013), and may have greater opportunities for sports practice and, consequently, be able to improve their PF which could influence (Tishukaj et al., 2017), in turn, their self-perception of PF. However, this study shows that adolescents from rural centers show a better self-perception of their PF, which could be due to a higher

prevalence of sedentary lifestyles in urban adolescents, to a greater practice of PA by rural adolescents spontaneously in open spaces, and to a greater use of available outdoor land for PA (Sylejmani et al., 2019). Even so, the differences between rural and urban areas, according to studies in different countries (Albarwani et al., 2009; Andrade et al., 2014; Chillón et al., 2011; Dollman et al., 2002; Peña Reyes et al., 2003; Tishukaj et al., 2017), are specific to each country or region and it is difficult to generalize the data since the sociocultural aspects are different in each area.

Practical Implications

In this research it has been observed that girls show a less positive self-perception of PF than boys, a self-perception that could be related, as mentioned above, to a rapid decrease in PA in girls with age, (KIMM et al., 2000; Kimm et al., 2002); as they enter adolescence, they spend more time to sedentary activities and present more barriers to PA practice (Pauline, 2013; Portela-Pino et al., 2019). In addition, the lack of motivation towards exercise and the stress generated by tasks other than Physical Education could trigger a lack of priority towards the practice of PA in their daily routine (Langguth et al., 2015). In this sense, from the subject of Physical Education and from the initial stages of training, a motivating sports practice should be promoted, focused on the interests and expectations of all students, where the student is an active agent and protagonist of his or her own learning. The use of this type of self-perception of PF instruments could be a good aid in promoting the practice of PA after school hours, being able to use this scale FP VAS A to monitor their PF and, thus, observe their evolution and design PA plans to improve the different physical capacities.

It has also been shown how students from rural centers show a better self-perception of PF than their peers from urban centers. Although it is possible that adolescents in urban areas have access to a greater number and variety of sports facilities than those in rural areas (Davison & Lawson, 2006; Hian et al., 2013), the urbanization processes linked to the lifestyles adopted by adolescents today promote sedentary lifestyle habits and little activity, physical or otherwise, performed outdoors. We could be talking about a possible "Nature Deficit", a concept developed by Louv, which is associated with a sedentary lifestyle, a continuous and persistent disconnection with nature over time, and with all the contact it implies (sports, excursions, walks…) (Louv, 2008). In this line, public administrations and city governments should emphasize the leading role of nearby natural environments and the variety of physical activities that can be carried out in them, creating events of PA and social interaction that promote the practice of sports for their positive impact on the well-being and health of people.

Limitations and future lines of research

It was not possible to establish cause-effect relationships since this research is a cross-sectional study. It would be interesting to further investigate these results to establish possible causal relationships in future studies.

The study sample consisted of students from educational centers exclusively from the autonomous community of Extremadura (Spain), and the response of the participants could be affected by the sociocultural factors of their own territory. In this sense, it would be enriching to use this type of study in other Spanish territories and compare the results obtained to analyze how adolescents throughout Spain perceive their PF.

In this study, the sample was very homogeneous (age; M=11.52; SD=0.88), covering only the last cycle of primary school (5th and 6th grades), the stage of the beginning of adolescence. Therefore, future research could assess the self-perception of PF in the three cycles of primary school (1st and 2nd; 3rd and 4th; 5th and 6th) and analyze their differences.

Conclusions

Boys presented a better self-perception of PF than girls for all abilities with the exception of self-perception of flexibility. Students from rural centers showed a better self-perception of PF at a general level and for all self-perceived physical abilities than students from urban centers. In addition, there was no relationship between self-perceived PF and age in early adolescence. Self-perceived FP could be of great importance in adolescence as an indicator of health and well-being for the future, and could motivate adolescents to adopt active and healthy lifestyle habits to improve their FP, helping them to face challenges and develop in other areas of their lives.

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