



## Influence of the type of sports practiced by Spanish adolescents on their self-concept, self-esteem, and physical fitness

*Influencia del tipo de deporte practicado por los adolescentes españoles en su autoconcepto, autoestima y condición física*

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### Abstract

**Introduction:** Adolescence is a critical period for mental health, and physical activity could help address this issue. Regular physical activity has been linked to improved mental health in young people. This may lead to better mental health outcomes by elevating physical self-concept and self-esteem.

**Objective:** to analyze the influence of the type of sports practiced by Spanish adolescents on their self-concept, self-esteem, and physical fitness.

**Methodology:** A total of 1180 adolescents aged 12 to 19 years from 4 high schools in Andalusia, Spain, participated in the study. The EUROFIT battery, which is validated and widely used battery for assessing physical fitness in adolescents, was administered during three different days, and the correlation between these variables was analyzed.

**Results:** Specifically, it was found that adolescents who did not practice sports present higher values of body mass index, although their values were lower in Sit-and-reach tests, Horizontal jump, Course Navette, Handgrip, physical self-concept Strength, and physical self-concept Attractive. Among those who did practice sports, individuals engaged in contact sports exhibited better physical abilities and higher levels of self-concept.

**Discussion:** our findings regarding self-concept and self-esteem align with existing literature.

**Conclusion:** those adolescents who participate in oppositional and contact sports present higher values of physical fitness and physical self-concept compared to those who participate in other type of sport or do not practice any sports. The specific interests of each adolescent must be addressed with the aim of improving adherence to extracurricular physical activity.

### Keywords

Fitness; self-concept; self-esteem; sport.

### Resumen

**Introducción:** La adolescencia es un período crítico para la salud mental y la actividad física podría ayudar a abordar este problema. La actividad física regular se ha relacionado con una mejor salud mental en los jóvenes. Esto puede conducir a una mejora de la salud mental al elevar el autoconcepto físico y la autoestima.

**Objetivo:** analizar la influencia del tipo de deporte practicado por los adolescentes españoles sobre su autoconcepto, autoestima y condición física.

**Metodología:** En el estudio participaron un total de 1.180 adolescentes de 12 a 19 años de 4 centros de secundaria de Andalucía, España. La batería EUROFIT, que es una batería validada y ampliamente utilizada para evaluar la aptitud física en adolescentes, se administró durante tres días diferentes y se analizó la correlación entre estas variables.

**Resultados:** En concreto, se encontró que los adolescentes que no practicaban deporte presentan valores más altos del índice de masa corporal, aunque sus valores fueron inferiores en las pruebas de Sit-and-reach, Salto horizontal, Course Navette, Handgrip, Autoconcepto físico, Fuerza y Autoconcepto físico Atractivo. Entre los que practicaban deportes, los que practicaban deportes de contacto exhibían mejores capacidades físicas y mayores niveles de autoconcepto.

**Discusión:** Nuestros hallazgos sobre el autoconcepto y la autoestima se alinean con la literatura existente.

**Conclusiones:** en general, se podría concluir que aquellos adolescentes que practican deportes de oposición y de contacto presentan valores más elevados de condición física y autoconcepto físico en comparación con aquellos que practican otro tipo de deporte o no practican ningún deporte. Se deben abordar los intereses específicos de cada adolescente con el objetivo de mejorar la adherencia a la actividad física extraescolar.

### Palabras clave

Autoconcepto; autoestima; condición física; deporte

## Introduction

Many mental diseases are thought to manifest during adolescence, a time of potential vulnerability (Patton et al., 2014). There are different approaches to address this issue and physical activity (PA) may be one of them (Denche-Zamorano et al., 2022). An extensive analysis of numerous systematic reviews has shown that PA is associated with mental health in young people (Biddle et al., 2019). Furthermore, it has been shown that adolescents who regularly engage in PA have greater physical fitness, which has positive effects on both their physical and mental health (Barbosa & Urrea, 2018). Physical fitness can be defined as the ability that any person has that allows them to carry out activities of daily living with vigor. It has various components related to health: aerobic power, muscular strength, and body composition, being an important biological marker of the general state of health and quality of life from an early age (Vernetta et al., 2023). More specifically, in Spanish population it has been seen that high levels of physical fitness, particularly in relation to aerobic endurance, may contribute to better mental health outcomes in adolescents by elevating their physical self-concept and self-esteem (Benitez-Sillero et al., 2023). Moreover, physical self-concept may have a positive relationship with the enjoyment of physical activity (Benítez-Sillero et al., 2024; Ramer et al., 2021).

Physical self-concept is one of the domains of self-concept in adolescent, which also includes others such as social or academic (Hapsari et al., 2023). Self-concept is defined as a person's opinions about their level of skill or suitability in particular functional areas, serves as a gauge of psychological health and psychological contentment (Coelho et al., 2020). Additionally, physical self-concept can also be divided into different sub-domains (Esnaola et al., 2011) for these authors the four sub-domains of Fox and Corbin's (1989): sport competence, attractive body, strength and physical condition could be more adequate for adolescent.

Likewise, self-esteem is a widely studied psychological construct, defined as a person's evaluation of themselves, in terms of value and competence, refers to a general sense of approval or disapproval of oneself and can influence various areas of life, from emotional well-being to academic performance and interpersonal relationships (Estrada-Araoz et al., 2025). Although frequently used synonymously with self-concept, self-esteem entails feelings of global self-worth, general happiness, and satisfaction. Nonetheless, many researchers and theorists acknowledge that they are distinct but connected structures (Coelho et al., 2020).

As mentioned before, adolescents who regularly engage in PA have been shown to have greater physical fitness, which has positive effects on both their physical and mental health (Barbosa & Urrea, 2018). More specifically, it has been demonstrated that consistent sports practice significantly improves muscle strength, cardiorespiratory fitness, and body composition (Agata & Monyeki, 2018; Cueto-Martín et al., 2018; Landry & Driscoll, 2012). Moreover, different authors have seen adolescents who engage in PA tend to have higher levels of self-concept and self-esteem (Benitez-Sillero et al., 2023; Mendo-Lázaro et al., 2017; Slutzky & Simpkins, 2009).

Furthermore, among Spanish young adults between the ages of 15 and 35, the degree of PA has been associated with the incidence of anxiety, depression, and other mental illnesses (Denche-Zamorano et al., 2022). Not only the level of PA may influence in the incidence of mental illnesses, but some other authors have also indicated that differences may arise based on the type and duration of sports practiced (Honório et al., 2024; Slutzky & Simpkins, 2009) although this is not well established yet. For example, in middle school students, those students that practiced sport without body contact showed significantly higher levels on behavior, one domain of self-concept, but not in global self-concept, compared with those that practice sports with body contact (Honório et al., 2024). Finally, according to Slutzky & Simpkins (2009) research, children's perceptions of their abilities can have an impact on their overall self-esteem when they participate in different types of sports. Therefore, more information about which sports offer further benefits for mental and physical health would be valuable knowledge for health professionals when recommending exercise to their clients. So, although Fox & Corbin in 1989 recommended that research should be done about the antecedents of Physical Self-Perceptions such as actual ability, parental influence or sport among other (Fox & Corbin, 1989) there is still research to be done. For this reason, the main aim of the study is to analyze the influence of the type of sports practiced by Spanish adolescents on their self-concept, self-esteem, and physical fitness.



## Method

A cross-sectional descriptive study was performed.

### *Participants*

A total of 1180 adolescents aged 12 to 19 years (mean = 14.80; standard deviation = 1.64 years), being the 50,5% of them boys, from 4 high schools in Andalusia, Spain, participated in the study. The sample was selected by convenience.

### *Procedure*

The current research was conducted following the approval obtained from the participants' schools and the signed consent forms from their families. We adhered to ethical standards from both national and international guidelines, including the Declaration of Helsinki and laws safeguarding personal data. Also, the project received approval from the University of Córdoba's Human Research Ethics Committee. The students involved were briefed on the study's purpose, emphasizing that their involvement was anonymous, confidential, and voluntary.

#### *Anthropometric characteristics*

Anthropometric data were assessed in a single session, with participants being barefoot and lightly clothed. A Tanita model TBF-350 (Tanita Corporation, Arlington Heights, IL) leg-to-leg impedance analyzer was used for BIA (bioimpedance) measurements according to manufacturer guidelines. Weight in kilograms (kg) and fat percentage were measured with an accuracy of 0.1 kg. Hydration status is important for accurate assessment of body composition using BIA. For this reason, in accordance with BIA guidelines the subjects were asked to abstain from exercise prior to their test and avoid caffeinated beverages such as soda and coffee prior to their test. This Tanita model has been previously validated (Loenneke et al., 2013). Height in centimeters (cm) was measured using a SECA stadiometer with an accuracy of 0.1 cm, portable stadiometer has been studied as a reliable and valid for use (Baharudin et al., 2017). Additionally, the body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared ( $BMI = \text{weight (kg)} / \text{height (m)}^2$ ).

#### *Fitness tests*

During three different days, the EUROFIT battery, which is a validated and widely used battery for assessing physical fitness in adolescents, was administered. This battery consists of five tests that are familiar to the students as they are regularly used as part of their assessment tools throughout their education (Evelein et al., 2011; Ortega et al., 2008). The description of the tests is below:

- a) 30 seconds sit up tests: This test assesses muscular endurance. Participants lie face up on a mat with their hands behind the back of their neck. Their legs are flexed at 90 degrees with their feet supported. Participants must then perform as many sit-ups as possible in 30 seconds while touching their knees with their elbows. The number of correct executions of the movement is recorded using a Casio HS-80TW stopwatch.
- b) Sit-and-reach flexibility test: This test measures the range of motion of the hip. Participants should reach as far as possible distance (in cm) with their hands extended, moving with fingertips a ruler located on the surface of the box (Adhesive tape measure). Participants must be seated on a mat, with the legs extended and resting the soles of the feet on a standardized box. Then, they must flex the trunk forward. According to the protocol, the measure of 15 cm is placed in the situation where the feet rest.
- c) Horizontal jump: This test evaluates the ballistic muscular strength of the lower limbs. Participants start from a static position immediately after a line, with their feet shoulder width apart and parallel. They must jump as far as possible without losing balance upon landing. The distance jumped (in cm) is recorded using an adhesive tape measure. Two attempts are allowed, and the best (greater distance) is selected.
- d) Handgrip strength: This test assesses the strength of the upper limbs. Participants grip a TAKEY TKK 5110 dynamometer with an adjustable handle and gradually and continuously press it for 2 s, generating the greatest strength possible. The strength is measured in kg with a precision of 0.1 kg. Two attempts are made with each hand, and the best result is recorded.



e) Course Navette. This test indirectly evaluates the maximum aerobic capacity. Participants perform a maximal incremental run over a 20-meter distance, with an out-and-back course. The author's original software in mp3 version 25 is used for this test. The test begins at a gentle pace, and participants must cover changes of direction at the time of the sound signal, which progressively accelerates. The test continues until the participant is no longer able to maintain the imposed pace. The time taken to complete the test is measured in min and s to ensure accurate measurements. To avoid any potential alteration between tests, the tests were performed on different days following a specific order. On day one the Sit-and-reach flexibility test and the sit-up test were conducted. On day two, the 20-meter shuttle run (Course Navette) was performed. On day three, the handgrip strength test and the horizontal jump test were administered.

This sequencing of tests on different days helps ensure accurate and consistent measurements by allowing participants to fully recover between each assessment (Benítez-Sillero et al., 2023).

### *Physical self-concept*

The abbreviated 8-item format (Rodríguez Fernández et al., 2015) of the Physical Self-concept Questionnaire (Goñi Grandmontagne et al., 2004) was used in the study. Participants responded to the questionnaire using a five-point Likert-type scale, where 1 represented "false" and 5 represented "true." Several sentences were used for example, "I feel happy with my body image." The scores from the individual items were summed to obtain an overall score on general self-concept, although items 5 and 7 were swapped. The questionnaire assessed the physical self-concept across four dimensions: strength, attractiveness, ability, and condition. The internal consistency values of the test were found as  $\alpha = 0.82$ .

### *Self-esteem*

To assess self-esteem the Rosenberg Self-Esteem Scale (RSES) was employed (Rosenberg, 2015). The items focus on different aspects of self-esteem and are answered on a four-point Likert scale ranging from 1 (fully agree) to 4 (fully disagree). For example, "I feel that I have a number of good qualities" or "I feel that I'm a person of worth, at least on an equal plane with others." This questionnaire showed good Cronbach's alpha values for self-esteem ( $\alpha = 0.85$ ),

### *Physical activity*

To determine the level of physical activity, two questions were asked. The first of them is based on the first question of the PAQ-A questionnaire (Martínez-Gómez et al., 2009), although some modification is made to it. Do you regularly attend any type of physical activity classes, sports...? Indicates type of activity and days in the week. The students answer with a number from 0 to 7 depending on the days of the week in which they carry out the activity.

For the analysis of the type of physical activity, the answer to open questions were categorized into the following categories: non-practicing people, individual activities (athletics, cycling and swimming), fitness (Pilates classes, strength, etc.), dance classes, rhythmic gymnastics, individual racket sports (tennis and badminton), racket sports in pairs (paddle), wrestling (karate, judo, kickboxing, boxing), volleyball, team sports (basketball and handball) and football. To carry out this differentiation, motor praxeology was used as a reference (Parlebas, 2001). As volleyball is a sport without contact with the opponent, it was decided to separate it from the rest of the team sports. Football was also analyzed in a specific way due to the large number of people playing it and its differentiated social characteristics in our country (Benítez-Sillero et al., 2021; Benítez-Sillero et al., 2023).

The following criteria have been used to group sports according to their characteristics, based on motor skills (Parlebas, 2001).

The competitive nature of the activities was determined if there is confrontation among the participants for outperforming each other, this classification not referring exclusively to the regulated or federated competition. The activities considered non-competitive were fitness and dance.

The aspect referred to as the individual or collective component is determined if there is cooperation and motor communication with at least another individual to achieve the common objective of the essence of the activity. The individual activities were: the individual category of athletics, cycling, swimming, fitness, dance, rhythmic gymnastics, tennis, and badminton.



Contact activities are determined if there is direct body-to-body interaction among the sportspeople who are confronted with achieving different objectives in the activity. Contact activities were wrestling, team sports and football.

The opposition aspect is determined if there is a dueling situation in which at least two components of the activity have antagonistic objectives and interact with each other by establishing a counter-communication. The activities in which there was no opposition were: individual activities, physical conditioning, dance and rhythmic gymnastics.

Confusing or doubtful answers were eliminated.

### Data analysis

Descriptive data was presented as mean (M)  $\pm$  standard deviation (SD). Firstly, the differences in relation to the practice of physical activity were analyzed with the T-Student test. Subsequently, an analysis was carried out using the ANOVA test for comparisons based on the type of physical activity practiced with the anthropometric and fitness variables, as well as with those of physical self-concept and self-esteem, with a post-hoc analysis using the Bonferroni test of subgroups based on sex. Data coding and analysis was done with SPSS, version 25, and significance was set at  $p < 0.05$ .

## Results

In table 1, descriptive data and differences between the no practice and practice groups are presented. Significant differences between the practice and no practice groups are found in all variables except for the Sit-and-reach test. Specifically, adolescents who do not engage in any physical activity presented higher values of BMI, although their values were lower in Sit-ups, Horizontal jump, Course Navette, Handgrip, PSC Strength, PSC Attractive, PSC Ability, PSC Condition, PSC total, and Self-esteem.

Table 1. Descriptive data and differences between no practice and practice groups.

Variables	No practice		Practice		Between-groups comparison (p-value)
	n	M (SD)	n	M (SD)	
BMI	488	22.10 (4.56)	653	21.43 (4.07)	0.005
Sit up (n)	445	21.48 (5.94)	591	22.48 (6.39)	<0.001
Sit-and-reach (cm)	485	16.65 (8.83)	659	17.13 (9.03)	0.183
Horizontal jump (cm)	461	152.10 (37.46)	632	167.93 (35.55)	<0.001
Course Navette (periods)	471	4.12 (2.09)	649	5.39 (2.65)	<0.001
Handgrip (kg)	492	25.14 (7.79)	653	26.28 (7.96)	0.007
PSC Strength	505	2.65 (1.12)	675	3.17 (1.09)	<0.001
PSC Attractive	505	3.72 (1.30)	675	3.94 (1.15)	<0.001
PSC Ability	505	3.62 (1.12)	675	4.14 (0.95)	<0.001
PSC Condition	505	1.98 (1.19)	675	2.83 (1.19)	<0.001
PSC total	505	2.99 (0.82)	675	3.52 (0.78)	<0.001
Self-stem	394	0.49 (0.56)	475	0.67 (0.55)	<0.001

Abbreviations: M = mean value; SD = standard deviation; BMI = body-mass index; PSC = physical self-concept.

Differences in physical fitness variables according to the type of sport practiced are shown in table 2. Adolescents in the no practice group presented significantly higher BMI compared to those who practiced competitive, collective, opposition, and contact sports. Regarding the Sit-up test, adolescents who practice any sport performed better compared to those who do not participate in any sport. Additionally, adolescents in collective, opposition, or contact sports presented the highest values in this test. In the Sit-and-reach test, adolescents who do not participate in competitive, opposition, and contact sports performed better compared to those who participate in these types of sports. Regarding the Horizontal jump and Course Navette, adolescents who participate in any type of sport obtained higher values compared to those in the no practice group, while in Handgrip, participants in competitive, opposition, and contact sports show greater values compared to those who do not participate in these types of sports.



Table 2. Differences in physical fitness variables according to the type of the practiced sport

Variable	Type	Sub-group	n	M (ES)	Between-groups comparison (p-value)
BMI (kg·m2)	No practice	a	490	22.11 (4.57)	-
	Competitive	b.1. no	134	21.84 (4.33)	-
		b.2. yes	477	21.16 (3.87)	a**
	Collective	c.1. no	333	21.39 (4.10)	-
		c.2. yes	278	21.23 (3.84)	a*
	Opposition	d.1. no	240	21.22 (3.95)	a*
		d.2. yes	371	21.37 (4.01)	a*
	Contact	e.1. no	315	21.43 (3.98)	-
		e.2. yes	296	21.20 (3.99)	a*
Sit up (n)	No practice	a	447	21.50 (5.94)	-
	Competitive	b.1. no	124	23.52 (5.46)	a**
		b.2. yes	428	24.77 (6.55)	a***
	Collective	c.1. no	294	23.60 (6.01)	a*** c.2***
		c.2. yes	258	25.52 (6.56)	a***
	Opposition	d.1. no	215	23.36 (5.73)	a*** d.2**
		d.2. yes	337	25.21 (6.60)	a***
	Contact	e.1. no	282	22.88 (5.87)	a** e.2***
		e.2. yes	270	26.18 (6.38)	a***
Sit-and-reach (cm)	No practice	a	488	16.63 (8.81)	-
	Competitive	b.1. no	134	20.59 (9.07)	a*** b.2***
		b.2. yes	482	16.23 (8.93)	-
	Collective	c.1. no	333	19.06 (9.22)	a*** c.2***
		c.2. yes	283	14.97 (8.52)	a*
	Opposition	d.1. no	239	20.03 (8.99)	a*** d.2***
		d.2. yes	377	15.37 (8.75)	-
	Contact	e.1. no	315	19.33 (9.09)	a*** e.2***
		e.2. yes	301	14.94 (8.63)	a*
Horizontal jump (cm)	No practice	a	463	151.90 (37.49)	-
	Competitive	b.1. no	125	151.31 (33.55)	b.2***
		b.2. yes	466	173.08 (34.44)	a***
	Collective	c.1. no	321	161.66 (36.55)	a*** c.2***
		c.2. yes	270	176.59 (32.13)	a***
	Opposition	d.1. no	230	158.25 (35.39)	d.2***
		d.2. yes	361	175.00 (33.82)	a***
	Contact	e.1. no	304	157.24 (34.47)	e.2***
		e.2. yes	287	180.38 (32.33)	a***
Course Navette (pe- riods)	No practice	a	474	4.10 (2.10)	-
	Competitive	b.1. no	133	4.41 (2.04)	b.2***
		b.2. yes	474	5.76 (2.72)	a***
	Collective	c.1. no	330	4.94 (2.26)	a*** c.2***
		c.2. yes	277	6.08 (2.93)	a***
	Opposition	d.1. no	238	4.79 (2.16)	a*** d.2***
		d.2. yes	369	5.90 (2.84)	a***
	Contact	e.1. no	315	4.68 (2.20)	a* e.2***
		e.2. yes	292	6.30 (2.83)	a***
Handgrip (kg)	No practice	a	494	25.11 (7.78)	-
	Competitive	b.1. no	134	24.44 (7.49)	b.2**
		b.2. yes	476	26.74 (7.96)	a**
	Collective	c.1. no	332	25.68 (8.05)	-
		c.2. yes	278	26.90 (7.71)	a**
	Opposition	d.1. no	239	24.82 (7.68)	d.2**
		d.2. yes	371	27.15 (7.94)	a***
	Contact	e.1. no	314	24.56 (7.39)	e.2***
		e.2. yes	296	28.01 (8.07)	a***

Abbreviations: M = mean value; SD = standard deviation; BMI = body-mass index.

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001

Table 3 shows the differences in physical self-concept and self-esteem according to the type of sport practiced. Regarding PSC total, adolescents who do not practice any sport present lower values compared to those who practice any type of sport. Additionally, differences between practicing or not practicing any type of sport are found for all dimensions of the PSC except for PSC Attractive, where significant differences were only found between those who practiced or did not practice competitive or contact sports. In the case of self-esteem, the differences are significant between those who practiced some sport compared to those who did not practice any; however, there are no differences depending on the type of sport.



Table 3. Differences in physical self-concept and self-stem according to the type of the practiced sport

Variable	Type	Sub-group	n	M (ES)	Between-groups comparison (p-value)
PSC Strength	No practice	a	508	2.65 (1.13)	-
	Competitive	b.1. no	140	2.68 (1.07)	b.2***
		b.2. yes	492	3.30 (1.04)	a***
	Collective	c.1. no	341	3.04 (1.12)	a*** c.2**
		c.2. yes	291	3.31 (1.00)	a***
	Opposition	d.1. no	246	2.91 (1.12)	a** d.2***
		d.2. yes	386	3.32 (1.01)	a***
	Contact	e.1. no	324	2.90 (1.10)	a** e.2***
		e.2. yes	308	3.44 (0.97)	a***
PSC Attractive	No practice	a	508	3.70 (1.32)	-
	Competitive	b.1. no	140	3.66 (1.19)	b.2**
		b.2. yes	492	4.06 (1.09)	a***
	Collective	c.1. no	341	3.86 (1.16)	-
		c.2. yes	291	4.09 (1.07)	a***
	Opposition	d.1. no	246	3.85 (1.18)	-
		d.2. yes	386	4.04 (1.09)	a***
	Contact	e.1. no	324	3.82 (1.21)	e.2**
		e.2. yes	308	4.13 (1.00)	a***
PSC Ability	No practice	a	508	3.61 (1.12)	-
	Competitive	b.1. no	140	2.39 (1.14)	a* b.2***
		b.2. yes	492	2.98 (1.17)	a***
	Collective	c.1. no	341	3.99 (0.96)	a*** c.2***
		c.2. yes	291	4.39 (0.84)	a***
	Opposition	d.1. no	246	3.96 (0.98)	a*** d.2***
		d.2. yes	386	4.31 (0.86)	a***
	Contact	e.1. no	324	3.99 (0.96)	a*** e.2***
		e.2. yes	308	4.37 (0.84)	a***
PSC Condition	No practice	a	508	1.98 (1.18)	-
	Competitive	b.1. no	140	2.39 (1.14)	a*** b.2***
		b.2. yes	492	2.98 (1.17)	a***
	Collective	c.1. no	341	2.67 (1.20)	a*** c.2***
		c.2. yes	291	3.05 (1.13)	a***
	Opposition	d.1. no	246	3.35 (0.80)	a*** d.2**
		d.2. yes	386	3.66 (0.72)	a***
	Contact	e.1. no	324	2.58 (1.22)	a*** e.2***
		e.2. yes	308	2.12 (1.07)	a***
PSC total	No practice	a	508	2.99 (0.83)	-
	Competitive	b.1. no	140	3.16 (0.72)	b.2***
		b.2. yes	492	3.65 (0.75)	a***
	Collective	c.1. no	341	3.39 (0.78)	a*** c.2***
		c.2. yes	291	3.71 (0.04)	a***
	Opposition	d.1. no	246	3.35 (0.80)	a*** d.2**
		d.2. yes	386	3.65 (0.72)	a***
	Contact	e.1. no	324	3.32 (0.80)	a*** e.2***
		e.2. yes	308	3.76 (0.66)	a***
Self-stem	No practice	a	395	0.49 (0.56)	-
	Competitive	b.1. no	91	0.67 (0.51)	a*
		b.2. yes	351	0.70 (0.55)	a***
	Collective	c.1. no	218	0.55 (0.04)	a***
		c.2. yes	224	0.53 (0.04)	a***
	Opposition	d.1. no	156	0.69 (0.53)	a***
		d.2. yes	286	0.69 (0.54)	a***
	Contact	e.1. no	215	0.65 (0.56)	a**
		e.2. yes	227	0.73 (0.52)	a***

Abbreviations: M = mean value; SD = standard deviation; PSC = physical self-concept.

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001

## Discussion

The main aim of the study is to analyze the influence of the type of sports practiced by Spanish adolescents on their self-concept, self-esteem, and physical fitness. To achieve this, the physical fitness, self-concept, and self-esteem of a sample of adolescents up to 19 years of age is measured, and the correlation between these variables is analyzed. Additionally, differences are examined between adolescents who practiced sports and those who do not, as well as among different types of sports. All in all, no significant increase is found, teenagers who do not practice sports had lower levels of physical fitness. Among those who do practice sports, individuals engaged in contact sports exhibited better physical fitness and higher levels of self-concept.



Regular participation in physical activity has been consistently linked to improved physical fitness among adolescents, with associated benefits for mental and physical health (Barbosa & Urrea, 2018). Specifically, engaging in regular sports practice has been shown to lead to significant enhancements in muscle strength, cardiorespiratory fitness, and body composition (Agata & Monyeki, 2018; Cueto-Martín et al., 2018; Landry & Driscoll, 2012). Consequently, it can be asserted that adolescents who participate in sports tend to have better physical fitness than those who do not, a finding supported by our study. However, our research do not find significant differences in flexibility between adolescents who practiced sports and those who do not. This discrepancy may stem from the distinct factors influencing flexibility compared to overall fitness (Mittleman & Zacher, 2000). While fitness is influenced by physiological indices, movement economy, lactate threshold, neurological adaptations, and hormonal responses, flexibility is influenced by factors such as bone structure, tendons, joint capsules, and temperature regulation, as well as the effectiveness of warm-up and exercise routines (Brown et al., 2017). Additionally, flexibility training may not receive as much emphasis as it should (Cejudo, 2020). Finally, our findings regarding self-concept and self-esteem align with existing literature. Overall, adolescents who engage in physical exercise tend to have higher self-concept and self-esteem levels (Benitez-Sillero et al., 2023; Mendo-Lázaro et al., 2017; Slutzky & Simpkins, 2009). However, differences may arise based on the type and duration of sports practiced (Honório et al., 2023a; Slutzky & Simpkins, 2009).

There is limited research specifically examining the relationship between physical fitness qualities and the type of sport practiced (Farley et al., 2020). Our study reveals that participation in competitive, collective, opposition, and contact sports is associated with higher scores across various physical fitness variables, with few exceptions such as Sit up in competitive sports and Handgrip in collective sports. These findings align with recent research indicating that the development of physical fitness is closely linked to the type of sport practiced (Weast et al., 2014). Engaging in competitive sports, particularly those involving opposition and contact, has been shown to enhance physical fitness (Fransen et al., 2014; Tammelin et al., 2003). The specific physical demands of team sports lead to notable improvements in both upper and lower muscle strength (Matthys et al., 2011), whereas individuals participating in individual sports tend to exhibit better cardiovascular functions, explosive strength, sprinting ability, and acceleration and deceleration skills (Sole et al., 2021). Consequently, individual and team sports require distinct fitness levels and optimal anthropometric components (Kamarudin et al., 2022), which may account for the differences observed in our study.

In terms of self-concept and self-esteem associated with different types of sports, our study reveals that students engaged in opposition and contact sports tend to have a more positive physical self-concept compared to their counterparts. Furthermore, higher levels of self-esteem were consistently observed among those who participated in sports. These findings are consistent with several studies (Kirkcaldy et al., 2002; Weber et al., 2023), which have found that engagement in sports generally correlates with elevated self-esteem regardless of the specific type of sport.

However, distinguishing between individual and team sports does not yield a clear conclusion. While some studies suggest that individuals engaged in individual sports exhibit higher self-esteem (Šagát et al., 2021), others propose the opposite (Bojanić et al., 2019; Slutzky & Simpkins, 2009). Conversely, there are authors who argue that there is no significant difference in self-esteem between these two types of sports. Further research examining this phenomenon in greater depth is warranted.

In terms of self-concept and self-esteem, both tend to improve with sports participation. Contrasting individual and team sports, Dolenc (2015) found that athletes in individual sports perceive their bodies as stronger, more flexible, robust, and coordinated compared to those in team sports. However, in terms of general self-esteem, no significant differences were observed. On the other hand, Zurita-Ortega et al. (2016) suggest that participants in team sports exhibit higher self-concept. Yet, the discrepancy does not solely lie in the type of sport. Further analysis reveals that variations stem from other factors, such as athleticism level (Findlay & Bowker, 2009). In this regard, there's a positive correlation between self-concept and physical competence, as well as victory orientation. Similarly, exercise intensity plays a role (Luszczynska & Abraham, 2012). Moreover, variables like the setting where physical activity occurs (Hagger et al., 2011) and the frequency of practice should be considered. For instance, students engaging in sports three or more times a week tend to have a more positive self-concept (Moreno-Murcia et al., 2007).





In the context of contact sports, it's reasonable to expect practitioners to be more physically fit (Lupo et al., 2023). However, self-esteem and self-concept play crucial roles in performance, irrespective of whether the sport involves contact (Sawata Khetmalis, 2012). When considering whether contact sports players exhibit higher levels of self-esteem, findings vary. Some studies suggest there are no significant differences (Honório et al., 2023a). In fact, a systematic review by Zuckerman et al. (2021) noted that 14 out of 19 articles analyzed reported psychological improvements, including enhancements in self-esteem. Hence, further research in this area is warranted.

This study has some limitations that should be acknowledged. The main one is the absence of comparison between sexes for each sport modality, which is influenced by the sample. Therefore, it is recommended to perform future studies analyzing this sex-comparison. The physical tests utilized may not encompass all pertinent dimensions of physical fitness necessary to effectively differentiate between various types of sports, so future studies must consider applying different physical fitness tests. Furthermore, since self-esteem and self-concept were assessed via self-report questionnaires, there exists a possibility of response bias, as participants may tend to answer in a socially desirable manner. Additionally, external events or life changes experienced by participants during the study period might impact their levels of self-esteem and self-concept, complicating the attribution of changes solely to physical activity. Investigating the relative influence of differences between individual and team sports, considering the sex of the participants, would be particularly insightful for future research.

## Conclusions

In general, it could be concluded that those adolescents who participated in opposition and contact sports present higher values of physical fitness and PSC compared to those who participate in other type of sport or didn't practice any sport. Additionally, self-esteem is higher in the practice group compared to the adolescent in the no practice group. These results suggest the need to encourage the participation of adolescents in any sport as part of an extracurricular PA. Although it has been observed that opposition and contact sports generate a better level of physical condition and PSC, the specific interests of each adolescent must be addressed with the aim of improving adherence to extracurricular PA.

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