



Original / *Sports and exercise*

## Perception of physical fitness is associated with perception of body weight; sociodemographic analysis in Spain

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### Abstract

**Introduction:** The objective of this study was to analyse the relationship between sociodemographic characteristics, body weight perception and physical fitness perception.

**Methods:** Survey by means of personal interview. The sample consisted of 8,594 participants living in Spain between 15 and 97 years of age. Sampling error was  $\pm 1.07\%$ .

**Results:** Of the people who reported having good or excellent physical fitness, there was a proportionally greater prevalence of males, people aged 15 to 34, people with university studies and people from an upper or very upper social class ( $P < 0.001$ ). It was also inferred that there was a greater possibility of perceiving deficient or very bad physical fitness in cohorts who felt that they should gain a bit of weight (OR = 2.87), lose a bit of weight (OR = 2.31) or lose a lot of weight (OR = 8.78).

**Conclusion:** Perception of physical fitness is associated with perception of body weight, independently of people's sociodemographic characteristics.

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Key words: *Physical fitness perception. Body weight perception. Sociodemographic characteristics.*

### Abbreviations

C: Contingency quotient.

CI 95%: Confidence interval of 95%.

CIS: Centro de Investigaciones Sociológicas (Sociological Research Center).

OR: Odds ratio.

z: Corrected typified remainders.

$\chi^2$ : Pearson's chi-square test for independence.

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### LA PERCEPCIÓN DEL ESTADO DE FORMA FÍSICA ESTÁ ASOCIADA A LA PERCEPCIÓN DEL PESO CORPORAL; ANÁLISIS SOCIODEMOGRÁFICO EN ESPAÑA

### Resumen

**Introducción:** El objetivo del trabajo fue analizar la relación entre características sociodemográficas, percepción de peso corporal y percepción de estado de forma física.

**Métodos:** Encuesta mediante entrevista personal. La muestra estuvo formada por 8.594 participantes residentes en España de entre 15 y 97 años. El error muestral fue  $\pm 1,07\%$ .

**Resultados:** Entre las personas que declararon estar bien de peso o tener una forma física buena o excelente hubo, proporcionalmente, mayor prevalencia de hombres, jóvenes de entre 15 y 34 años, personas con estudios universitarios y ciudadanos de clase social alta o muy alta ( $P < 0,001$ ). Además, se infirió mayor posibilidad de percibir una forma física deficiente o muy mala en las cohortes que consideraron que les vendría bien ganar algo de peso (OR = 2,87), perder unos pocos kilos (OR = 2,31) o perder muchos kilos (OR = 8,78).

**Conclusión:** La percepción del estado de forma física está asociada a la percepción del peso corporal, independientemente de las características sociodemográficas de las personas.

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Palabras clave: *Percepción de estado de forma física. Percepción de peso corporal. Datos sociodemográficos.*

### Introduction

The Centro de Investigaciones Sociológicas (CIS) operating under the auspices of the Spanish Ministry of the Presidency, with the chief mission of producing studies of Spanish society. Since 1980, every five years without fail the CIS has conducted surveys on the sports habits of people living in Spain. These surveys use personal interviews and rigorously selected samples to produce highly reliable studies.<sup>1,2</sup> Two markers asked about in the 2010 survey were body weight perception and physical fitness perception.

With regard to body weight, obesity is known to increase the risk of cardiovascular and respiratory diseases,<sup>3</sup> and that people with obesity can come under social pressure, or be made fun of by their peers or relatives,<sup>4</sup> which can lead to stigmatisation.<sup>5</sup> At the same time, and without contradicting the above, it is well known that there are frequent cases of people who,

although having an objectively balanced weight, perceive themselves to be more obese than they really are,<sup>6</sup> which among other effects can lead them to have a less positive image of their body. In this sense, the work of Jáugeri-Lobera et al.<sup>7</sup> is of particular interest, as it uses a sample of Spanish adolescents to analyse the relationship between perception of body weight and other variables, such as body assessment, self-esteem and general mental health. With regard to physical fitness, obesity is negatively related to physical fitness in the different periods of evolution of a person's life,<sup>8,9</sup> and studies show that physical fitness is a powerful marker of health.<sup>10</sup>

Thus, in accordance with the above, the objective of the study was to analyse the relationship between sociodemographic characteristics, body weight perception and physical fitness perception. The hypothesis was that people who feel that they have an imbalanced body weight also perceive that they are less physically fit, regardless of their sociodemographic profile.

## Methods

### *Procedure and ethical considerations*

This research is a second analysis of data from the Survey on Sports Habits in Spain carried out by the CIS in 2010 (n = 8.925).<sup>2</sup> The CIS provided and authorised the use of the data for this study and the Ethics Committee of the Autonomous University of Madrid approved the research.

### *Variables*

Six variables were analysed: gender, age, level of studies, economic status, body weight perception and physical fitness perception. Three age categories were formed: 15-34 years, 35-54 years, and 55 years or older. For the level of studies variable, four categories were established: no studies, primary education, secondary education or vocational training, and university education. For the sociodemographic status variable, five categories were established: unskilled manual worker, skilled manual worker, traditional middle classes, new middle classes, and upper or very upper class. With regard to perception of body weight, participants were asked what they thought of their body weight, by choosing from four answers: fine with current weight; should gain a bit of weight; should lose some weight; and should lose a lot of weight. Finally, with regard to the physical fitness variable, participants were asked to say how fit they were according to five possible answers: very bad; deficient; acceptable; good; and excellent. The answers were then grouped into three categories: deficient and very bad; acceptable; and good or excellent.

### *Participants and sampling error*

For this study only participants with complete data in all the aforementioned variables were selected, excluding sampling units with lost cases or who failed to answer any of the questions. The final sample consisted of 8,594 participants (96.29% of those surveyed), aged between 15 and 97. Considering these data, the sampling error for a confidence level of 95% (1.96 sigma),  $p = q$ , and using the single random sampling method, was  $\pm 1.07\%$ .

### *Statistical analysis*

Pearson's chi-square test for independence ( $\chi^2$ ) was performed, quantifying the degree of association of the relationships by means of the statistical contingency coefficient (C). The directions of the differences were identified by analysing the corrected typified remainders (z). To estimate whether the different perceptions of body weight increase the likelihood of participants perceiving a deficient or very bad state of fitness, a dichotomous simple logistic regression was carried out, inferring the odds ratio (OR) and confidence interval at 95% (CI 95%). Calculations were made using the *IBM SPSS Statistics 20* software package (IBM Corporation, USA). The established confidence level was 95% ( $p < 0.05$ ).

## Results

As table I shows, both the body weight perception and physical fitness perception were associated with the sociodemographic variables of gender, age, level of studies and socioeconomic status ( $P < 0.001$ ). The contingency coefficients indicated intensities of association of between 0.07 and 0.17 for body weight, and between 0.09 and 0.22 in physical fitness. With regard to the people who reported having good body weight, the largest positive typified remainders indicated that there was a proportionally greater prevalence of males ( $z = 8.2$ ), people between the ages of 15 to 34 ( $z = 9.3$ ), people with university studies ( $z = 3.8$ ) and people from an upper or very upper social class ( $z = 3.8$ ). The same categories were observed upon analysis of the cohort who perceived their physical fitness to be good or excellent: males ( $z = 10.7$ ), people aged 15 to 34 ( $z = 12.8$ ), people with university studies ( $z = 2$ ) and people from an upper or very upper class ( $z = 3$ ).

Table II shows that, having adjusted the sociodemographic variables analysed in this study (model 2), in relation to people who report having a well-balanced body weight, there is a greater possibility of perceiving deficient or very bad physical fitness in cohorts who considered that they should gain a bit of weight (OR = 2.87), lose a bit of weight (OR = 2.31) or lose a lot of weight (OR = 8.78).

**Table I**  
Body weight perception and physical fitness perception. Chi-square test for independence

Sociodemographic variables	n	%	Body weight perception				Physical fitness perception		
			Fine with current weight 47.7% (n = 4,097)	Should gain a bit of weight 3.9% (n = 336)	Should lose some weight 38.8% (n = 3,331)	Should lose a lot of weight 9.7% (n = 830)	Very bad 16.5% (n = 1,419)	Acceptable 38.6% (n = 3,314)	Good or excellent 44.9% (n = 3,816)
Gender			$\chi^2=96.1$ ; df = 3; P < 0.001; C = 0.10				$\chi^2=131.9$ ; df = 2; P < 0.001; C = 0.12		
Female	4,349	50.6	<b>43.3 (-8.2)</b>	<b>3.3 (-3.1)</b>	<b>42.1 (6.4)</b>	<b>11.4 (5.4)</b>	<b>19.8 (8.2)</b>	<b>41 (4.7)</b>	<b>39.3 (-10.7)</b>
Male	4,245	49.4	<b>52.2 (8.2)</b>	<b>4.6 (3.1)</b>	<b>35.4 (-6.4)</b>	<b>7.9 (-5.4)</b>	<b>13.2 (-8.2)</b>	<b>36.1 (-4.7)</b>	<b>50.7 (10.7)</b>
Age (years)			$\chi^2=254.5$ ; df = 6; P < 0.001; C = 0.17				$\chi^2=457.9$ ; df = 4; P < 0.001; C = 0.22		
15-34	2,815	32.8	<b>54.8 (9.3)</b>	<b>6.7 (9.4)</b>	32.7 (-8)	<b>5.7 (-8.6)</b>	<b>8.5 (-14)</b>	<b>36.8 (-2.4)</b>	<b>54.7 (12.8)</b>
35-54	3,063	35.6	<b>44.9 (-3.9)</b>	<b>2.9 (-3.7)</b>	<b>42.2 (4.9)</b>	10.1 (0.9)	<b>13.9 (-4.8)</b>	<b>41.4 (4.1)</b>	44.6 (-0.4)
≥ 55	2,716	31.6	<b>43.4 (-5.4)</b>	<b>2.2 (-5.6)</b>	<b>41.1 (3.1)</b>	<b>13.3 (7.8)</b>	<b>27.7 (19)</b>	37.2 (-1.8)	<b>35.1 (-12.5)</b>
Level of studies			$\chi^2=91.4$ ; df = 9; P < 0.001; C = 0.08				$\chi^2=339.6$ ; df = 6; P < 0.001; C = 0.19		
No studies	576	6.7	44.6 (-1.5)	2.4 (1.9)	36.6 (-1.1)	<b>16.3 (5.6)</b>	<b>41.1 (16.5)</b>	<b>32.1 (-3.3)</b>	<b>26.7 (-9.1)</b>
Primary	4,127	48	47.7 (0.1)	4 (0.4)	38.2 (-1.0)	10 (1.1)	<b>17.7 (2.8)</b>	<b>36.5 (-3.8)</b>	45.9 (1.7)
Secondary or vocational training	2,450	28.5	<b>45.6 (-2.4)</b>	<b>4.7 (2.4)</b>	<b>41 (2.7)</b>	8.7 (-1.9)	<b>11.2 (-8.3)</b>	<b>42.5 (4.8)</b>	46.2 (1.6)
University	1,441	16.8	<b>52.3 (3.8)</b>	<b>2.9 (-2.1)</b>	37.3 (-1.3)	<b>7.6 (-2.9)</b>	<b>12.4 (-4.7)</b>	40.4 (1.6)	<b>47.3 (2)</b>
Socioeconomic status			$\chi^2=48.1$ ; df = 12; P < 0.001; C = 0.07				$\chi^2=70.3$ ; df = 8; P < 0.001; C = 0.09		
Unskilled manual workers	1,171	13.6	<b>42.6 (-3.7)</b>	4.7 (1.5)	40.1 (1)	<b>12.6 (3.6)</b>	18.3 (1.7)	36.5 (-1.5)	45.2 (0.2)
Skilled manual workers	2,803	32.6	47.8 (0.2)	3.6 (-0.9)	38.9 (0.1)	9.7 (0.1)	16.4 (-0.2)	38.3 (-0.3)	45.3 (0.5)
Traditional middle classes	1,544	18	48.3 (0.5)	<b>2.7 (-2.8)</b>	38.6 (-0.1)	10.5 (1.2)	<b>21.9 (6.3)</b>	<b>35.5 (-2.7)</b>	<b>42.6 (-2)</b>
New middle classes	1,706	19.9	47 (-0.7)	<b>4.7 (2)</b>	39.3 (0.5)	9 (-1)	<b>14.2 (-2.9)</b>	<b>42.6 (3.8)</b>	43.3 (-1.5)
Upper or very upper class	1,370	15.9	<b>52 (3.5)</b>	4.2 (0.5)	36.9 (-1.5)	<b>6.9 (-3.7)</b>	<b>12.1 (-4.6)</b>	39.3 (0.6)	<b>48.6 (3)</b>

Abbreviations:  $\chi^2$  = chi-squared value; df = degrees of freedom; P = probability of statistical significance. C = contingency coefficient. In each cell for the different categories: percentage (followed by corrected typified remainders). In **bold**: statistically significant typified remainders.

## Discussion

One of the strengths of the study was the large sample size (more than eight thousand participants) and its high representative capacity for the population living in Spain (sampling error of barely 1%). Considering the sample as a whole, 47.7% reported having good body weight, 3.9% stated that they should gain a bit of weight, 38.8% said they should lose a bit of weight, and 9.7% reported that they should lose a lot of weight. At the same time, 16.5% feel that they are in a deficient or very bad state of physical fitness, 38.6% think that they have acceptable fitness, and 44.9% reported having good or excellent fitness. However, these percentages are not independent from the socioeconomic characteristics of the people surveyed, and vary depending on the variables of gender, age, level of studies and socioeconomic status.

With regard to the variable of gender, studies exist that conclude that women perceive more obesity than

men do.<sup>6,11,12</sup> The data provided by this study indicates similar findings, such as that 53.8% of the females surveyed feel that they should lose a bit or a lot of weight, whereas the same applies for 43.3% of the males, a figure that is backed up by the perception of physical fitness, where 50.7% of the males feel that they are in a good or excellent state of fitness, whereas the same only applies to 39.3% of the females. Age shows a higher intensity of association than the other sociodemographic variables analysed in this study, with increased age, the percentages of people who feel they have a well-balanced body weight falls, and the perception of a deficient or very bad state of physical fitness rises. In this regard, other authors have affirmed prior to this analysis that the prevalence of weight and obesity increases with age.<sup>13</sup> An association was also observed between level of studies and perceived body weight and physical fitness. For example, in the cohort of people with no studies, 16.3% think that they should lose a lot of weight, and 41.1% feel that their physical fitness is deficient or

**Table II**  
Simple binomial logistic regression model. Possibility of perceiving a deficient or very bad state of fitness depending on body weight

	Perception of deficient or very bad physical fitness					
	Model 1			Model 2		
	OR	CI (95%)	P	OR	CI (95%)	P
Fine with current weight	1	reference	–	1	reference	–
Should gain a bit of weight	<b>2.12</b>	8.08-11.46	<0.001	<b>2.87</b>	2.08-3.97	<0.001
Should lose some weight	<b>2.40</b>	2.08-2.76	<0.001	<b>2.31</b>	2.00-2.67	<0.001
Should lose a lot of weight	<b>9.63</b>	1.56-2.88	<0.001	<b>8.78</b>	7.31-10.54	<0.001

Abbreviations: OR = odds ratio. CI (95%) = confidence interval of 95%. P = probability of statistical significance. Model 1: Logistic regressions without adjusting any confounding variables. Model 2: Logistic regressions adjusted for the co-variables of gender, age, level of education and socioeconomic status. In **bold**: statistically significant odds ratio.

very bad; however, in the cohort of people with university studies, these percentages drop to 7.6% and 12.4%, respectively. And similarly, with regard to socioeconomic status, the upper or very upper class cohort has proportionally more people who consider themselves to have a good weight and/or good or excellent physical fitness. Thus, a joint analysis of the variables of academic level and socioeconomic status makes it possible to state that the cultural and social capital of people living in Spain is related to body weight and physical fitness perception.

Finally, the main conclusion of this study is that, regardless of age, gender, level of studies and socioeconomic status, people who feel that they should gain or lose weight are more likely to perceive a deficient or very bad state of physical fitness, an aspect that is particularly relevant among the cohort of people who think that they should lose a lot of weight, with an odds ratio of more than 8, taking people who report having good body weight as the point of reference. Consequently, in light of the above, the hypothesis of the study is confirmed: people who feel that they have an imbalanced body weight also perceive that they are less physically fit, regardless of their sociodemographic profile.

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