Research article

Cross-sectional study on body image and self-esteem among adolescents in Catalonia

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Abstract

Background: Research data to evaluate crucial components of adolescence maturational process is needed and a challenge for researchers and field professionals. Objectives: Promote positive body image, healthy habits and changes in self-esteem among both boys and girls at High schools in our area, though the analysis of measurements and obtained research data. Methods: Self-reported questionnaire assessed 323 students. Physical measurements (weight, height, BMI) were registered in all participants. The questionnaire measured body image perception (Gardner body image evaluation scale), self-esteem (Rosenberg self-esteem scale) and body image concern (Adonis complex questionnaire). Results: The body image distortion score was similar by gender and it decreased by age. The body dissatisfaction score was negative and higher in girls. Body dissatisfaction score and self-esteem were related, so participants with low self-esteem showed a higher body dissatisfaction score. Clear association was also shown between body dissatisfaction score and body image concern, females had a higher body concern and dissatisfaction than males. Discussion: These local measurements provided updated data on our population and they will be taken in consideration to implement community health programs and further tailor intervention programs.

Keywords: body image; self-esteem; adolescence; cross-sectional study

Introduction

Adolescence is a transitional phase of growth and development between childhood and adulthood. The World Health Organization (WHO) defines an adolescent as any person between ages 10 and 19 [1]. During adolescence, the individual experiences the intense process of maturation characterized by physical, psychological, sexual and social changes.

Body image is a complex concept that comprises perceptive and emotional aspects [2,3]. Effective measures of body image deal with individual feelings including satisfaction/dissatisfaction, physical self-consciousness, beliefs, ideas and behavior concerning appearance [4]. The assessment of body dissatisfaction would predict unhealthy behaviors among boys and girls with differing patterns between genders [5]. In United States, 25% of normal- weight adolescent girls and around 5% of normal-weight adolescent boys perceived themselves to be too heavy [6-8], and up to 48% of overweight adolescent girls and up to 61% of overweight adolescent boys perceived themselves to be about the right weight [6-9]. Norwegian adolescents experience severe body dissatisfaction and only 50% meet the government's recommendations on physical activity and intake of fruits and vegetables [10]. In a Spanish cohort, up to 22% of adolescent boys perceived themselves too thin and 39% of adolescent girls perceived themselves as overweight [11].

The mass media promote ideal standards for beauty that

place great emphasis on slenderness in women and lean muscularity in men [12,13]. These conflicting messages might have a negative influence on teenager's development of self body image and inaccurate perceptions, leading to health problems (i.e. low self-esteem, mood disorders, anxiety, eating disorders).

Since 2004 in Catalonia there is a public Program call "Health and School" [14], where a public health nurse visits High schools weekly and closely works with teachers, staff and families. The nurse supports teenager's population health, delivers preventive health care programs, promotes and protects the health within High school population. The program "Health and School" focus on healthy habits, mental health, emotional well-being and substance abuse. However, there is a lack of observational research on these intervention programs and most of the published studies are based on data of other countries, which cannot be assumed to reflect or generalize in our community.

The main aim of this pilot cross-sectional study is to investigate through a school-based student health survey the body-image perception, self-esteem and body image concern in teenagers from 12 to 19 years old. In order to promote positive body image, healthy habits and changes in self-esteem among both boys and girls at High schools in our area. The study will contribute with new evidence-based knowledge on our population and further tailor intervention programs.

Methods
Participants

Cross-sectional study conducted among students of a public High school (Lo pla d'Urgell) in Bellpuig (Lleida, Spain). A structured, self-reported questionnaire was administered to 426 students (201 boys, 225 girls) between September 2015 and June 2016. The study population was heterogenic in both gender and age (from 12 to 19 years-old) and they voluntarily participated. The participants were grouped in three age groups: 12-14, 15-16 and 17- 19 years old. A 100 students were excluded from the study due to parental declined consent (N=88), previous diagnose of eating disorder (N=1), mental retardation diagnose (N=8) and lack of understanding the language of the questionnaire (N=3). A total of 323 students were assessed and included in the cross-sectional study (156 boys, 167 girls) (Figure 1). The study protocol was approved by the Institut d'Investigació en Atenció Primària (IDIAP) Jordi Gol i Gurina Ethical Committee (registration number p16/002). All participants (students, parents, teachers) were detailed informed and they singed a letter of consent to participate in the study. A Nurse registered the students' weight and height prior codification and students filled out anonymously the questionnaires.

Measures
Physical measurements

A certified Nurse registered weight (kg) and height (m) of the participants in standing position, barefoot and in light garments. Body mass index (BMI=kg/m2) was calculated by weight (kg) divided by the squared height (m).

Body image

Body image perception was measured by the Gardner Body
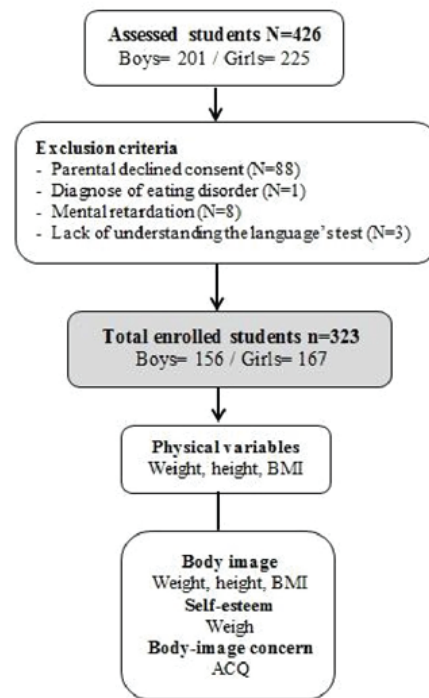

Figure 1. Flowchart of the cross-sectional study on healthy body image and self-esteem among adolescents.

Image Evaluation Scale [15,16]. Gardner's scale consists on 13 drawing silhouettes of 8 centimeters in height that represents schematic contours of a human figure. The average silhouette illustrates the average weight distribution on the reference population. On the average silhouette modifications were made increasing and decreasing ± 30% its volume; this created a continuum of silhouettes from the smallest to the biggest (-30%, -25%, -20%, -15%, -10%, -5%, average, 5%, 10%, 15%, 20%, 25%, 30%). A copy with the 13-drawings was provided to the participants and they indicated which silhouette most resembles their body image (A; actual body image estimation) and which silhouette they would most like to resemble (I; ideal body image estimation).

A Nurse assigned a true silhouette (T) to each participant. The true silhouette of each participant was calculated based on a standard BMI normalized by age and gender from WHO growth reference tables [17] and it was shown as a defined percentile. Each silhouette was identified with a percentile growth range (-30%: <P5; -25%: P5-P10; -20%: P10-P20; -15%: P20-P30; -10%: P30-P40; -5%: P40-P45; average: P45-P50; 5%: P55-P60; 10%: P60-P70; 15%: P70-P80; 20%: P80-P90; 25%: P90-P95; 30%: >P95). The true silhouette for each participant was defined by the identification with one of the silhouettes and this method was defined to increase inter-rate reliability within nurses assigning true silhouettes to participants.

The body dissatisfaction score was calculated as the difference between actual body image estimation and ideal body image estimation (body dissatisfaction score=A-I). The body-image distortion score was defined as the difference between actual body image estimation and true silhouette (body-image distortion score=A-T). The resulting score ranged from -12 to +12.

Self-esteem

The Rosenberg Self-Esteem Scale (RSES) was used to assess global self- esteem of participants [18,19]. RSES is a 10-item questionnaire with a Likert-type response with scores between 1 and 4. A score less than 25 may indicate low self esteem, 26–29 normal self- esteem and 30–40 high self-esteem.

Body image concern

Body image concerns and the extent to which they affect the individual's daily life were assessed using the Spanish version of the Adonis complex questionnaire (ACQ) [20,21]. The ACQ is a 13-item scale with three response options ranging from "rarely or not at all" to "frequently", depending on the level of agreement (non pathological=0; intermediate=1; pathological=3). The total score ranges from 0 to 39, where higher scores indicate more problems associated with the Adonis Complex: slight concern (0-9), moderate concern (10-19), serious concern (20-29) and possibly pathological concern (30-39) [22].

Statistical analyses

Continuous variables are expressed as mean and standard deviation (SD) and categorical variables as absolute and relative frequency. Age and gender groups were compared using Chi- square test for categorical variables and the non-parametric Mann-Whitney and Kruscall-Wallis test for numeric variables. The lineal correlation between BMI, body-image distortion score and body dissatisfaction score were analyzed using Pearson's correlation (negative coefficients indicate that the higher the BMI, the higher the desire to be thinner). SPSS 25.0 software was used for data management, statistical analysis and plotting of the results. Statistical difference was considered significant at p-values ≤ 0.05.

Results

The total enrolled students in this pilot study were 323 teenagers (51.7% girls) between 12 and 19 years old. Mean participant age was 14.5±1.7. Participants were distributed on three age groups: 12-14 (N=170; 52.6%), 15-16 (N=104; 32.2%) and 17-19 years old (N=49; 15.2%). The BMI z-scores ranged from -5 to +5, with a mean value of 0.94±3.1 (BMI: 20.9±3.1) on boys and 0.91±2.9 (BMI: 21.4±3.4; Mann-Whitney test, P=0.929) on girls. The majority of participants had a normal or healthy weight (boys: 76.3%; girls: 76.6%), but 21.2% of boys and 21.6% of girls were overweight/obese without statistical differences by gender (Chi-square test, P=0.601). By age group, participants had mainly a normal or healthy weight in all three groups (12-14=73.5%; 15-16=78.8%; 17-19=81.6%) and the number of participants with overweight or obese decrease with age (Kruskal-Wallis test, P=0.049) (Table 1).

The Gardner Body Image Evaluation Scale measured the body image perception of teenagers. Female participants desired to be thinner (Desired weight: -2.01±1.7, Mann-Whitney test, P<0.001) and this trend was maintained in all three age groups (12-14=-1.09±2.3; 15-16=- 1.1±2.1; 17-19=-0.47±1.8; Kruskal-Wallis test, P=0.083), but it decreased by age. The body image distortion score (difference between actual and true

body image) was similar by gender but it showed a decrease by age (12-14=-1.41±2.6; 15-16=-1.23±2.2; 17-19=-0.61±2.2; Kruskal- Wallis test, P=0.053). The body dissatisfaction score (difference between actual and ideal body image) was negative and higher in girls (-1.71±2.4, Mann-Whitney test, P<0.001) than in boys and slightly decrease by age (12-14=0.92±2.7; 15-16=0.55±2.3; 17-19=0.2±2.7; Kruskal-Wallis test, P=0.350) (Table 1).

A positive correlation was shown between BMI and body image distortion score (Pearson's correlation coefficient, r=0.499, P=0.194) and a negative correlation between BMI and body dissatisfaction score (Pearson's correlation coefficient, r=-0.441, P=0.249) (Figure 2).

The RSES is a measure of global self-esteem. The mean score of the overall boy's participants was 32.1±4.5 and on girl's participants was 30.5±5.2 (Mann-Whitney test, P=0.004). The self-esteem was similar through age (12-14=30.2±5.1; 15-16=32.7±4.7; 17-19=31.7±3.7; Mann-Whitney test, P=0.001) and RSES showed significant differences by gender and age. Self- esteem was higher in boys than in girls (high self-esteem: boys=72.4%, girls=58.7%). 19.2% of girl participants had a low self-esteem, and it maintained in the young group of age (12- 14:19.4%). However, it decreased with age (17-19:4.1%; Mann-Whitney test, P=0.006) (Table 2).

The body image concern was evaluated by the Adonis complex questionnaire. Female participants showed a higher body image concern than boys (boy=4.54±4.3; girl=5.53±4.0; Mann-Whitney test, P=0.004), even though both were classified on the slight concern category of the questionnaire. Age groups also showed these differences (12-14=4.54±4.3; 15-16=5.53±4.0; 17-19=5.05±4.2; Mann-Whitney test, P=0.004). The enrolled students were mainly classified on two categories: slight and moderate concern, none of the participants were scored on the pathological categories (serious concern and possibly pathological concern) (Table 2).

A potential association within body image distortion score, body dissatisfaction score, Rosenberg Self-Esteem Scale and Adonis complex questionnaire were analyzed to define elements would be fundamental in the body image perception. No association was found between body image distortion score and self-esteem neither with body image concern. A clear association was shown between body dissatisfaction score and body image concern (Mann- Whitney test, P=0.038), where girls had a higher body concern and dissatisfaction than boys. Body dissatisfaction score and self-esteem were also related (Mann-Whitney test, P<0.001), so participants with low self-esteem showed a higher body dissatisfaction score (Table 3).

Discussion

The main aim of the present pilot study was to provide data concerning body-image perception, self-esteem and body image concern in teenagers from 13 to 19 years old, through a school-based student questionnaire. To this end, a total of 323 participants were assessed and BMI score calculated. 76.3% of male adolescence and 76.6% of female adolescence had a normal or healthy weight, without differences by gender. The body image distortion score was similar by gender and it decreased with age, though the body dissatisfaction score was
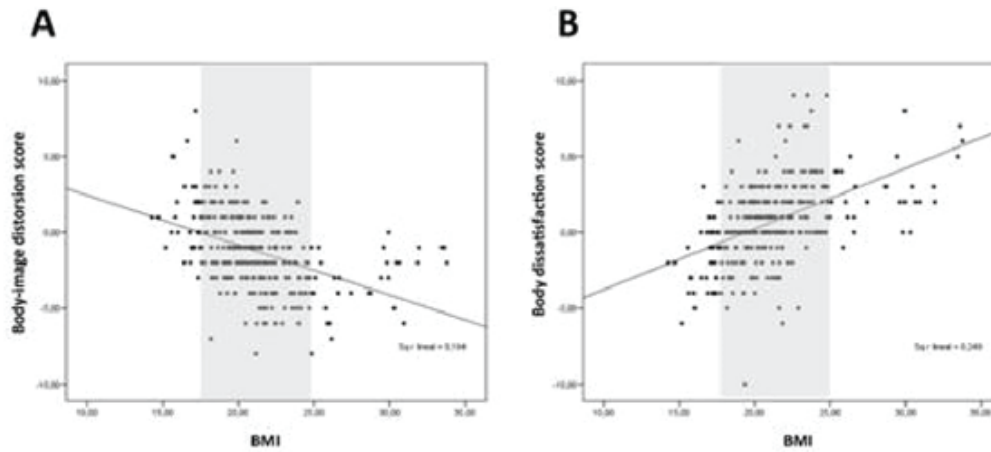
Figure 2. Scatterplots of body- image distortion score and body dissatisfaction score by body mass index.

Table 1. Descriptive weight categories and body-image Gardner's test.

Variables	Boys N=156	Girls N=167	Pa	12-14 years N=170	15-16 years N=104	17-19 years N=49	pb
BMI by percentile, mean (SD)	0,94 (3.1)	0.91 (2.9)	0.929	1.24 (3)	0.68 (3)	0.35 (3.1)	0.138
BMI by percentile categories			0.601				0.049
Underweight, number (%)	4 (2.6)	3 (1.8)		2(1.2)	3(2.9)	2(4.1)	
Normal or healthy weight, number (%)	119 (76.3)	128(76.6)		125(73.5)	82(78.8)	40(81.6)	
Overweight, number (%)	16 (10.3)	26 (15.6)		26 (15.6)	12 (11.5)	4 (8.2)	
Obese, number (%)	17 (10.9)	10 (6)		17 (10)	7 (6.7)	3 (6.1)	
Perceived weight, mean (SD)	-0.31 (2.5)	-0.3 (2.6)	0.888	-0.17 (2.7)	-0.55 (2.3)	-0.27 (2.6)	0.590
Desired weight, mean (SD)	0.08 (2.1)	-2.01 (1.7)	<0.001	-1.09 (2.3)	-1.1 (2.1)	-0.47 (1.8)	0.083
Body-image distortion score, mean (SD)	-1.25 (2.7)	-1.21 (2.2)	0.954	-1.41 (2.6)	-1.23 (2.2)	-0.61 (2.2)	0.053
Body dissatisfaction score, mean (SD)	-0.39 (2.4)	1.71 (2.4)	<0.001	0.92 (2.7)	0.55 (2.3)	0.2 (2.7)	0.350

a: Mann-Whitney test, Chi-square test; b: Kruskal-Willis test

Table 2. Evaluation of self-esteem by Rosenberg scale and evaluation of body image concern by Adonis complex questionnaire.

Variables	Boys N=156	Girls N=167	Pa	12-14 years N=170	15-16 years N=104	17-19 years N=49	pb
Rosenberg scale, mean (SD)	32.1 (4.5)	30.5 (5.2)	0.004	30.2 (5.1)	32.7 (4.7)	31.7 (3.7)	0.001
Self-esteem scale classification			0.001				0.006
Low, number (%)	11 (7.1)	32 (19.2)		33 (19.4)	8 (7.7)	2 (4.1)	
Medium, number (%)	32 (20.5)	37 (22.2)		37 (21.8)	17 (16.3)	15 (30.6)	
High, number (%)	113 (72.4)	98 (58.7)		100 (58.8)	79 (76)	32 (65.3)	
Adonis complex questionnaire, mean (SD)	4.54 (4.3)	5.53 (4)	0.004	4.54 (4.3)	5.53 (4)	5.05 (4.2)	0.004
Body image concern scale classification			0.414				0.414
Slight concern, number (%)	138 (88.5)	142 (85)		138 (88.5)	142 (85)	280 (86.7)	
Moderate concern, number (%)	18 (11.5)	25 (15)		18 (11.5)	25 (15)	43 (13.3)	

a: Mann-Whitney test, Chi-square test; b: Kruskal-Willis test

Table 3. Distribution of body image distortion score and body dissatisfaction score by age and gender, corrected by BMI z-score.

Variables	Male N=156	Female N=167	12-14 years N=170	15-16 years N=104	17-19 years N=49	TOTAL N=323	pa
mean (SD)	mean (SD)		mean (SD)	mean (SD)	mean (SD)	mean (SD)	
Body image distortion score							
Body image concern scale							0.681
Slight concern	-1.24 (2.6)	-1.18 (2.1)	-1.45 (2.5)	-1.25 (2.2)	-0.21 (1.8)	-1.21 (2.4)	
Moderate concern	-1.33 (3.3)	-1.4 (2.7)	-1.14 (3.1)	-1.09 (2.7)	-2.2 (3)	-1.37 (2.9)	
Self-esteem scale							0.862
Low	-1.73 (2.2)	-1.09 (2.1)	-1.36 (2.4)	-1.13 (1.1)	0 (1.4)	-1.26 (2.4)	
Medium	-0.94 (3.2)	-1.22 (2.2)	-1.3 (2.8)	-1.35 (2.5)	-0.27 (2.5)	-1.09 (2.7)	
High	-1.29 (2.5)	-1.24 (2.3)	-1.46 (2.6)	-1.22 (2.3)	-0.81 (2.1)	-1.27 (2.4)	
Body dissatisfactions score							
Body image concern scale							0.038
Slight concern	-0.36 (2.3)	1.48 (2.2)	0.76 (2.6)	0.44 (2.2)	0.21 (2.3)	0.58 (2.4)	
Moderate concern	-0.67 (3.3)	3 (3)	2.05 (3.6)	1.45 (3.1)	0.2 (4.1)	1.47 (3.6)	
Self-esteem scale							<0.001
Low	0.73 (2.8)	3.03 (3.6)	2.45 (3.7)	2.25 (3.6)	3 (1.4)	2.44 (3.5)	
Medium	-0.47 (3.5)	1.89 (2)	1.27 (3.1)	0.88 (2.3)	-0.47 (3.5)	0.80 (3.1)	
High	-0.48 (2)	1.2 (1.8)	0.29 (2)	0.3 (2.2)	0.34 (2.3)	0.30 (2.7)	

a: Mann-Whitney test

negative, higher in girls than in boys and it slightly decreased with age. Female participants desired to be thinner and this trend was maintained in all three age groups. Self-esteem was higher in boys than in girls. Female participants showed a higher body image concern than boys. A clear association was shown between body dissatisfaction score and body image concern/self-esteem, which showed that girls had a higher body concern and dissatisfaction than boys, and participants with low self-esteem showed a higher body dissatisfaction score. This study provides updated data on the association between body image perception and self-esteem among High school students in a local area. Based on the current standardized measures and experimental findings, new community health intervention program and integrate disease prevention approach will be (re)designed and applied to a widespread population.

Girls underestimated their weight status and they wanted to be thinner, which was similar to American [23] and European population [24]. Weight underestimation was associated with excessive consumption of certain high-energy food and non-healthy eating habits [25]. Child obesity and overweight have remained stable in Catalonia from 2006 to 2012, but the prevalence disf obesity is higher in boys than girls [26]. This indicates the importance of promoting accurate and realistic weight status in both normal weight and overweight children.

The desired body image is different between genders: men want to have a higher body image against the reduction of women. The increase desired by men could be explained by a desire to increase muscle mass [12], even though current data did not show this trend in our population. Raising awareness of body image perception on adolescence is challenging. However, the body image distortion score was not pathological, participants could define them as normal. By age, distortion score was negative and decreased, because of normal maturation processes.

In addition, body image concern was higher in girls and it increased with age and body dissatisfaction score was directly related with body image concern and self-esteem. A positive correlation between the BMI and body image dissatisfaction score was observed [27]. So, it is important that interventions would target at these components. 20% of eligible students did not sign the consent, it is difficult to tell whether the inclusion of these students might have introduced a bias or the reasons why families declined to participate in the pilot study. The new intervention programs should engage families on them, as well as integrate standardized outcome measures and experimental findings.

Conclusions

To our knowledge, this is the first research pilot study conducted in Catalonia that investigated body-image perception, self-esteem and body concern in teenagers from 12 to 19 years old. Particularly, it developed a school-based question-

naire using a combination of physical measurements and tests. So, the physical parameters (BMI) and body image perception of adolescents were analyzed more specifically. The research results can be utilized as base data to develop effective intervention programs in the future since it provides information not only on our area population but also on youth actual body image perception.

Abbreviations

A: actual body image estimation; ACQ: adonis complex questionnaire; BMI: body mass index; I: ideal body image estimation; Kg: kilogram; M: meter; P: percentile; RSES: Rosenberg self-esteem scale; SD: standard deviation; T: true silhouette; WHO: world health organization.

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Conflicts of Interest

The authors have no conflicts of interest to disclose

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