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Article

Prevalence of body self-image dissatisfaction and correlations with anthropometry variables in urban Mediterranean adolescents

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Abstract: The critical changes in physical appearance during adolescence can considerably influence the self-appraisal of body image. The purpose of this study is to analyze body self-image gender differences in Mediterranean adolescents, and his relationships to the anthropometric characteristics of this population in different phases of the adolescence. Participants were 809 Mediterranean teenagers (396 females) aged 11 to 17. A relative low prevalence of dissatisfaction with body image was observed among healthy urban Mediterranean adolescents (boys 17.3%; girls 22.7%). Girls showed statistically significantly higher mean BSQ scores than boys (M = 61.7, SD = 26.6 versus M = 56.3, SD = 27.1; $p < 0.001$). Girls in the late adolescence were more often classified as being dissatisfied (31%) in comparison to those in the early adolescent group (19.1%; $p < 0.05$). There was a good correlation of BSQ scores with all the anthropometric variables in males but not in females.

Keywords: body self-image; adolescent; anthropometry; nutritional status

1. Introduction

Adolescence is a period of intense biopsychosocial maturation [1]. In both sexes, the most relevant changes during this crucial development period are related to body morphological transformations [2]. These critical changes in physical appearance can considerably influence adolescents' self-appraisal of body image [3]. This self-concept of body image (BI) is a multidimensional construct involving the accuracy of the person's perception of the shape and size of the body along with the feelings that this representation can cause [4].

To evaluate negative feelings regarding BI, different instruments have been culturally adapted for adolescents. Self-assessment questionnaires are best suited to evaluate the components of BI in both epidemiological and clinical studies [5,6]. One of these instruments is the Body Shape Questionnaire (BSQ) [7], which is aimed at exploring BI self-perception. The BSQ is one of the most-used tools in research concerning the psychological impact of body characteristics in the adolescent population at the national and international levels. BSQ validations have been conducted in different populations, yielding data that confirm the excellent level of internal consistency in its original form. Raich et al. [8] adapted and validated the instrument to the Spanish population, showing high internal consistency (Cronbach's α oscillating from 0.97 to 0.95).

The purpose of this study is to analyze gender differences in BI satisfaction or dissatisfaction among Mediterranean adolescents by using the BSQ instrument. The relationships of BI (according to BSQ scores) to the anthropometric characteristics of these adolescents are also assessed.

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2. Materials and Methods

2.1. Ethical approval

The Research Ethics Committee of the author's institution approved this study. Its execution was accomplished in accordance with the ethical principles for medical research involving human subjects (Declaration of Helsinki of the World Medical Association).

2.2. Participants

Among the 809 participants, 413 (51.1%) were male and 396 (48.9%) female. The mean age of the adolescents was 13.8 (*SD* = 2.0) for males and 13.7 (*SD* = 1.9) for females. Students were collected from 3 urban schools with similar middle-level socioeconomic conditions located in a Spanish Mediterranean big.

2.3. Anthropometric measures

Two measures for height were assessed, and we considered the mean of this value [9]. Age and sex were self-reported, and the classification of body mass index (BMI) (weight [kg]/height [m]^2) was used as the primary assessment of nutritional status. Nutritional status was categorized according to the percentile values for age and gender: underweight, BMI percentiles below the fifth; eutrophic, between fifth and 85th percentiles; overweight, between the 85th and 95th; and obesity, above the 95th percentile. The categorization of the adolescence period was performed as proposed by the WHO [10]: early adolescence period (EAP), 10 to 13 years; middle adolescence period (MAP), 14 to 15 years; and late adolescence period (LAP), 16 years or more.

2.4. Body self-image evaluation

The instrument selected for body image assessment was the Body Shape Questionnaire (BSQ) [7], with transcultural adaption for Spanish adolescents [8]. The BSQ is a self-administered questionnaire consisting of 34 questions in a Likert-like self-reporting scale, with six response options (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = Very often, 6 = always). These questions cover four areas: body dissatisfaction, 12 questions; fear of gaining weight, seven questions; feelings of worthlessness because of appearance, 10 questions; desire to lose weight, six questions. Four levels of dissatisfaction with physical appearance were considered and was scored as follows: free of body dissatisfaction, below 80 points; mild dissatisfaction, 80–110 points; moderate dissatisfaction, 110 to 140 points; and severe dissatisfaction, greater than or equal to 140 points [11].

The decision to use this questionnaire was based on several criteria: adaptation to the Spanish population, specificity to the assessment of body dissatisfaction among adolescents, brevity, and ease of application. The reliability of this questionnaire has been secured, with high internal consistency obtained in the study of adaptation (Cronbach's alpha between 0.95 and 0.97) [8].

2.5. Statistical Analysis

Anthropometric data and scores from the questionnaires were evaluated using the statistical software SPSS v.20. A descriptive analysis was performed using frequency, mean values, and standard deviations. For contrast analysis, non-parametric tests were selected, since not all the numerical variables showed a normal distribution when assessed by the Kolmogorov-Smirnov test. The variation in scores of body image dissatisfaction between different periods of adolescence and between groups of nutritional status was evaluated by the Kruskal-Wallis test. To compare the mean scores of the instruments both between sexes and among groups related to adolescence period, we applied Mann-Whitney's U test. The Chi-square, in the case of ordinal factors, and the Fisher exact test for the nominal factor were applied to examine the associations of adolescence periods (early, middle, and late), sex, and nutritional status, as well as the frequency of subjects classified as satisfied and dissatisfied by the BSQ.

A model of binary logistic regression was adjusted to determine which of the independent variables had significant associations with the risk body dissatisfaction. To meet the response variable's requirement for dichotomy, the BSQ was reorganized into two categories: satisfied

(classified as free of body dissatisfaction) and dissatisfied (with some level of dissatisfaction: mild, moderate, or severe). The same was done for the nutritional status variable, which had its four categories grouped into two: underweight/eutrophic and overweight/obesity. To establish correlations between different anthropometric variables, a regression test (Pearson's r) was used. The level of probability (*p*-value) was considered statistically significant for values < 0.05.

3. Results

3.1. Anthropometric data

Table 1 shows the global average of the anthropometric data of the participants distributed by sex. There were statistically significant differences between boys and girls in height, weight, and body surface (BS).

Table 1. Descriptive data of age and anthropometric variables according to sex.

	Boys (n: 413)		**Girls (n: 396)**		
	Mean ± SD	Range	Mean ± SD	Range	P*
Height (cm)	157,8±10,9	135-189	155,9±8,3	135-177	0.036
Weight (kg)	50,8±13,9	24,9-118	48,41±10,7	25-82,1	0.026
BMI (kg/m2)	20,1±3,5	12,2-33,3	19,69±3,0	13,5-33,1	0.149
BS (m2)	1,65±0,3	1,1-2,8	1,61±0,2	1,1-2,2	0.025

BMI: body mass index; BS: body surface
*Kruskal-Wallis test

According to the categorization of the adolescence period, 404 (49.9%) were in the early adolescence period (EAP), 218 (26.9%) in the middle adolescence period (MAP), and 187 (23.1%) in the late adolescence period (LAP). The results concerning anthropometric variables and nutritional status classification according to periods of adolescence and sex are indicated in Table 2 and 3. There were statistical significance differences between girls and boys only in height, weight and body fat percentage within MAP and LAP, but not in EAP (Table 2). Girls at the LAP showed a higher proportion of underweight than boys (13.1% versus 2.9%) (Table 3).

Table 2. Descriptive analysis of the anthropometric variables for periods of adolescence.

	Boys				**Girls**			
	EAP	MAP	LAP		EAP	MAP	LAP	
	Mean ± SD	Mean ± SD	Mean ± SD	P*	Mean ± SD	Mean ± SD	Mean ± SD	P*
Height	150.2±7.2	163.1±8.3÷	168.3±7.4÷	<0.001	150.9±7.5	159.3±5.8	162.9±5.1	<0.001
Weight	42.8± 8.8	55.7±10.6÷	62.6±14.6÷	<0.001	43.3±10.3	52.1±9.7	54.8±6.8	<0.001
BMI	18.8±2.8	20.8±2.9	21.9±4.1	<0.001	18.8±2.9	20.5±3.3	20.6±2.0	<0.001
Fat %	14.0±4.1	14.1±5.1÷	14.4±5.7÷÷	ns	14.8±4.0	16.0±4.7	14.3±2.5	<0.01
FMI	2.7±1.2	3.1±1.5÷÷	3.3±2.1	<0.01	2.9±1.3	3.4±1.6	3.0±0.8	<0.01

EAP: early adolescence period; MAP: middle adolescence period; LAP: late adolescence period; BMI: body mass index; FMI: Fat mass index; SD: standard deviation
* Kruskal-Wallis test; ns: no significant differences
÷ Mann-Whitney test; p<0.001 as compared to girls in the same period of the adolescence.
÷÷ t-test; p<0.05 as compared to girls in the same period of the adolescence.

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Table 3. Nutritional status in the different periods of the adolescence based on BMI values.

	Boys			Girls		
Nutritional Status	EAP n (%)	MAP n (%)	LAP n (%)	EAP n (%)	MAP n (%)	LAP n (%)
Underweight	15 (7.1)	3 (3.0)	3 (2.9)	10 (5.2)*	5 (4.2)*	11 (13.1)**
Eutrophic	163 (77.3)	80 (80.0)	81 (78.6)	153 (79.7)	94 (79.0)	59 (70.2)
Overweight	24 (11.4)	10 (10.1)	13 (12.6)	20 (10.4)	15 (12.6)	11 (13.1)
Obesity	9 (4.3)	6 (6.1)	6 (5.8)	9 (4.7)	5 (4.2)	3 (3.6)

EAP: early adolescence period; MAP: middle adolescence period; LAP: late adolescence period.
(*) Chi-square test: $p<0.05$ comparing with girls at the LAP.
(**) Chi-square test: $p>0.05$ comparing girls and boys at similar adolescence period.

3.2. BSQ scores

The mean value of the BSQ scores in the whole sample was 59.0 (SD = 26.9). Girls showed statistically significantly higher mean values than boys (M = 61.7, SD = 26.6 versus M = 56.3, SD = 27.1; Mann-Whitney test, Z = –3.912; $p < 0.001$). According to BSQ score stratification, 339 boys (82.7%) were satisfied with their body image, while 71 (17.3%) were dissatisfied: 54 (13.2%) with mild dissatisfaction, 10 (2.4%) with moderate dissatisfaction, and 7 (1.7%) with severe body dissatisfaction. Among girls, 304 (77.4%) were satisfied with their body image, while 89 (22.7%) were dissatisfied: 69 (17.6%) with mild dissatisfaction, 14 (3.6%) with moderate dissatisfaction, and 6 (1.5%) with severe body dissatisfaction. No statistically significant differences were found in the distribution of body image dissatisfaction and sex.

There was a progressive increase in BSQ mean scores with age in boys and girls (Figure 1). Differences between genders were only found at 11 and 12 years of age, when girls showed higher mean values. At 11 years, boys exhibited a BSQ mean value of 48.3 (SD = 19.9), and girls of 65.6 (SD = 25.3) (Mann-Whitney test, Z = –4.328; $p < 0.001$). At 12 years, boys exhibited a BSQ mean value of 52.2 (SD = 25.3), and girls of 58.4 (SD = 25.9) (Mann-Whitney test, Z = –2.219; $p < 0.05$).

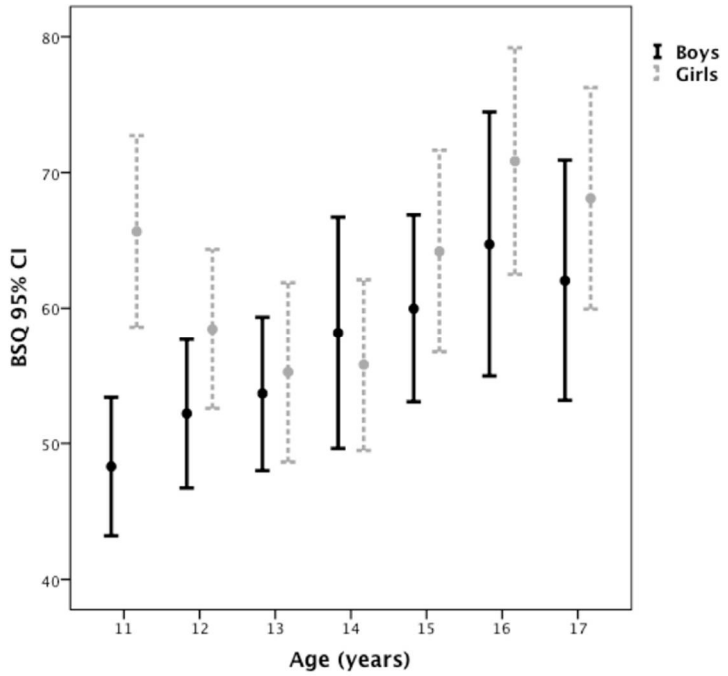

Figure 1. BSQ mean scores at the different ages according to sex (CI = coefficient interval).

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Table 4 discloses BSQ mean scores and frequency of body image dissatisfaction among the three periods of adolescence and both sexes. It was found that individuals in the LAP were more dissatisfied in comparison to adolescents in the EAP and the MAP, and differences were statistically significant (Kurskal-Wallis test: Chi-square 21.249; $p < 0.001$). There were differences between the sexes in the mean scores of the BSQ, with greater dissatisfaction in female than in male adolescents (Mann-Whitney U test: $Z = –3,912$; $p < 0.001$).

Table 4. BSQ mean scores and frequency of body image dissatisfaction among the three periods of adolescence and sex

	Boys				**Girls**			
	EAP	**MAP**	**LAP**		**EAP**	**MAP**	**LAP**	
n	209	98	103	p*	193	116	84	p*
BSQ score (mean±SD)	51.5±23.0	59.3±26.4	63.3±33.0	0.001	59.3±26.2	60.1±26.6	69.7±26.4	0.001
BSQ Classification, n(%)								
Satisfied	179 (85.6)	80 (81.6)	80 (77.7)		158 (81.9)⁺	88 (75.9)	58 (69.0)	
Mild DS	25 (12.0)	13 (13.3)	16 (15.5)		24 (12.4) ⁺⁺	24 (20.7)	21 (25.0)	
Moderate DS	4 (1.9)	4 (4.1)	2 (1.9)		7 (3.6)	3 (2.6)	4 (4.8)	
Severe DS	1 (0.5)**	1 (1.0)	5 (4.9)		4 (2.1)	1 (0.9)	1 (1.2)	

*ANOVA test;
** Krusskal-Wallis test; $p<0.05$ as compared to LAT of the counterpart gender
⁺ Chi-square test; $p<0.01$ as compared to LAT of the same gender
⁺⁺ Chi-square test; $p<0.05$ as compared to LAT of the same gender

According to the BSQ's classification, girls in the LAP were more often classified as being dissatisfied (31%) than were those in the EAP group (19.1%; Fisher's test, $p < 0.05$). Regarding boys, the LAP group also disclosed a higher percentage of BI dissatisfaction (22.3%), but differences were not significant as compared to other groups (EAP, 14.4%; MAP, 18.4%).

3.3. Correlations between BSQ and anthropometry

Analyzing the whole sample, there was a good correlation of BSQ scores with all the anthropometric variables (Table 5). Interestingly, when both genders were analyzed separately, these correlations disappeared completely in girls, but they remained in boys.

Table 5. Correlations between BSQ scores and anthropometric variables.

	Boys (n=410)		**Girls (n= 393)**		**Total sample (n=813)**	
	Pearson Correlation	Sig. (bilateral)	Pearson correlation	Sig. (bilateral)	Pearson Correlation	Sig. (bilateral)
Age	,192	,000	,102	,043	,148	,000
BMI	,213	,000	-	-	,139	,000
Weight	,260	,000	-	-	,170	,000
Diameter arm	,189	,000	-	-	,095	,007
Diameter calf	,181	,000	-	-	,127	,000
Calf skinfolf	,115	,020	-	-	,093	,009
Tigh skinfold	,119	,016	-	-	,099	,005
Abdominal skinfold	,147	,003	-	-	,098	,005
Suprailiac skinfold	,163	,001	-	-	,095	,007
Triceps skinfold	,130	,008	-	-	,079	,025
Biceps skinfold	,125	,011	-	-		

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Σ 6 skinfolds	,154	,002	-	-	,100	,005
Fat weight	,246	,000	-	-	,151	,000
Fat percentage	,161	,001	-	-	,093	,009
FMI	,198	,000	-	-	,119	,001
Lean weight	,240	,000	-	-	,163	,000
Muscular weight	,228	,000	,104	,039	,176	,000
Endomorphy	,120	,015	-	-		
Mesomorphy	-	-	-	-		
Ectomorphy	-,119	0.16	-	-	-,084	,017

3.4. BSQ and nutritional status

When the BSQ's mean scores of body dissatisfaction were analyzed according to the nutritional status of the adolescents, there was a trend to more body image dissatisfaction in overweight and obese adolescents than in those with low BMI, without statistical significance.

The lowest frequency of body self-image dissatisfaction was found in boys and girls with underweight (14.3% and 15.4% respectively). Comparing sexes, BSQ mean values were more stable in girls, passing from 59.7 (SD = 23.2) in underweight to 68.0 (SD = 31.5) in obese girls (Figure 2). Only in the eutrophic group were there statistically significant differences, with higher BSQ mean values in girls (M = 61.5, SD = 26.3 versus M = 55.1, SD = 22.7; Mann-Whitney test, Z = –3.542; $p < 0.001$). Interestingly, it was observed that some eutrophic adolescents (19.5%) also expressed body dis < 0.05).

Using multifactorial analysis including sex, nutritional status, and adolescence period, only this last variable was related to body self-image dissatisfaction (Wilks' Lambda: 0.983; $p < 0.01$). The binary logistic regression model from the OR risk estimator confirmed that girls in the LAP had a significant association with body dissatisfaction (OR:1.19, $p = 0.043$, and OR:1.18, $p = 0.012$).

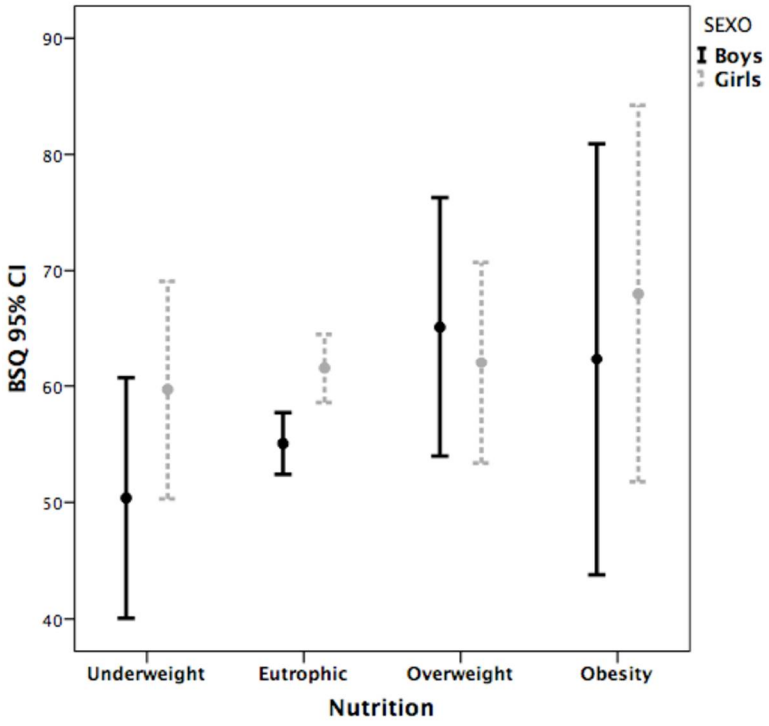

Figure 2. BSQ mean scores according to BMI nutritional status (CI = coefficient interval).

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4. Discussion

Using the BSQ cutoff of 80 points, the prevalence of body dissatisfaction in the current sample of Mediterranean adolescents was relatively low (17.3% for males and 22.7% for females), as compared to other similar studies [12,13]. Adolescents with moderate (111–140 points) or extreme (> 140) concern were also very low: 4.1% for males and 5.1% for females. Although the prevalence is higher in girls, these overall figures did not show any statistically significant difference between genders. However, analyzing the series by age, a significant increase was observed in the mean BSQ scores with increasing age. Although the increase in BSQ scores existed in boys, it was greater and statistically significant in girls. The relative deterioration of body self-image with age cannot be explained only by the increase in BMI that occurs between 10 and 17 years. At least, this does not apply for our sample of adolescent girls, since those with moderate and extreme concern about body dissatisfaction had similar BMIs to body-satisfied females.

In our series, 31.0% of girls in the late adolescence period (16–17 years of age) had concerns about body image, compared to 18.1% in early adolescence (11–13 years). These data are in accordance with previous literature reporting evidence that older adolescents, especially girls, have much a higher prevalence of body dissatisfaction than do younger adolescents [13,14-17]. The lower body dissatisfaction in early adolescence could be related to the lack of a body image identity due to the morphological and biopsychosocial changes occurring at early adolescence [18]. Adolescent girls seem to increase their personal expectations after menarche, being more dissatisfied with the changes related to the accumulation of body fat and turning their attention to weight reduction [4,19]. Furthermore, the internalization of a thin ideal body induced by the current culture may be one of the main factors influencing girls to dislike their physical appearances during late adolescence [20]. In boys, this effect may be less intense because they do not experience so much pressure to achieve an ideal body shape [21]. While the standard for the ideal female body is to be thin, the model for boys released by the current social atmosphere is a muscular and fat-free body [22,23].

Due to the high prevalence described in the literature, some authors consider as “normative” the occurrence of body dissatisfaction among girls [14,15,24]. However, in our sample of Mediterranean adolescent girls, concern about body dissatisfaction was only identified in less than one third of cases.

What about adolescent boys? The maturing process of boys differs from that of girls. The main characteristic is the progressive decrease of body fat and the corresponding increase of fat-free mass [25]. The increase in lean mass that occurs during adolescence in boys can be considered a protective factor against the development of feelings and/or thoughts of aversion against the body itself [16]. Previous literature postulated that body dissatisfaction seems to diminish throughout adolescence among adolescent boys [14,16,17,22,25]. However, at the different adolescence periods analyzed, BSQ scores obtained in boys in this study do not corroborate the previous findings. In our series, boys also increased their BSQ scores as age increased. In fact, 22.3% of males between 16 and 17 years had concerns about body image, compared to only 14.4% in the age group 11–13 years. Therefore, contrary to that previously reported, body dissatisfaction in boys does not tend to decrease as puberty advances. More interestingly, in our series, the mean age of boys with moderate or extreme body dissatisfaction was higher than that of unconcerned boys.

It has been reported that girls are almost twice as likely to have body dissatisfaction in relationships with boys (BSQ-OR 2.893, $p < 0.001$) [23]. These authors observed that female teenagers tend to feel disproportionately fat, even when eutrophic or underweight, disfiguring the perception of body self-image. In agreement with this observation, our data show that relationship,

but with less risk (BSQ-OR 1.119, p = 0.043). Furthermore, the overweight adolescents were more dissatisfied with their body image [23]. Remarkably, in our sample of healthy adolescents, worries about body image were related to higher BMI in boys, but not in girls. Extremely body-dissatisfied boys had a mean BMI of 25.5 ± 6.7, as compared to 19.9 ± 3.3 in unconcerned boys. Perhaps this phenomenon could be influenced by the internalization of the muscular body commonly desired by the boys [13,20,26]. Some authors claim that the ideal body can vary between different cultures [20,27,28]. It is possible in some cultural settings that increased muscle mass might not be good for body image in adolescent boys.

Studies performed in Brazil showed that body satisfaction in adolescents and children varied from 64 to 82% [12,29]. These figures are very similar to those presented in our study (from 77.3 to 82.6%). Conti et al. [12] found a mean of 73.2 ± 36.4 points in the BSQ in adolescents in the metropolitan region of São Paulo. Teenagers from small towns in the area of da Mata Mineira showed a mean BSQ of 67.6 ± 30.0 points. Del Duca et al. [29] evaluated 5,028 adolescents from public schools in the state of Santa Catarina, also in Brazil. As for adolescents in the municipalities of Minas Gerais, 78.9% were dissatisfied with their body image and wanted a different silhouette. Of these, 60.8% wanted a smaller silhouette, demonstrating the desire for a slimmer body type also among adolescents in rural municipalities.

Using the same BSQ tool, other studies have collected dissimilar data. Thus, in our country, a study obtained BSQ scores indicating that 44% of adolescents (n = 211) did not show any concern about body image, 34% (n = 163) exhibited a slight concern, 13.1% (n = 63) exhibited moderate concern, and only 9% (n = 43) were extremely concerned [30]. Another study showed that more than half of the surveyed adolescents (53.8%) expressed concern about their body image and wished to be thin [31]. These data differ notably from those found in our sample.

The results of the current study indicate that body dissatisfaction is a reality in the lives of urban Mediterranean adolescents, and that gender and morphological changes that occur during adolescence are factors related to such negative feelings of body image. The identification of factors that may influence body image dissatisfaction among adolescents seems therefore to be an important research issue, independent of the type and development of the population. These epidemiological studies, especially within school health developmental policy, are essential to provide information about teens' dynamics, helping educators and health professionals to design intervention strategies when needed.

5. Conclusions

Adolescent girls in our series obtained significantly higher BSQ scores than boys. The prevalence of body dissatisfaction was generally low: 17.4% for males and 22.7% for females. The rate of adolescents with moderate (111–140 points) or extreme concern (> 140 points) about body image was also very low: 4.1% for boys and 5.1% for girls. Analyzing the series by age, a significant increase was observed in the BSQ mean scores with increasing age. The increase was greater in girls but also existed in boys. In this series, 31% of girls aged 16 and 17 (late adolescent phase) had concerns about body image, compared to 18.1% in the 11–13 age group (early adolescence). In the whole sample, BSQ scores were positively correlated with some anthropometric parameters such as total weight, BMI, arm and calf diameters, fat weight percentage, fat mass index, lean muscle weight, and fold thicknesses (except the subscapularis). BSQ scores correlated therefore with the ectomorphy level. This applied particularly for boys, but not for girls. Some other psychosocial factors beyond anthropometry could explain this absence of correlation between BSQ and anthropometric parameters in girls, therefore deserving further research.

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Conflicts of Interest: The authors declare no conflict of interest.

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