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Dissatisfaction with body image among adolescent students: association with socio-demographic factors and nutritional status

Insatisfação com a imagem corporal entre adolescentes estudantes: associação com fatores sociodemográficos e estado nutricional

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Abstract *This article seeks to determine the prevalence of dissatisfaction with body image and its association with socio-demographic factors and nutritional status among adolescents. The following socio-demographic data, anthropometric variables, and perception of body image (n = 660) were collected. The prevalence of dissatisfaction with body image was 71.4%. Girls wished to reduce the size of their body silhouette, whereas boys wished to increase it. The desire to reduce body size was positively associated with female gender, with increased waist circumference and with excess weight. On the other hand, the desire to increase body size was negatively associated with the female gender and waist circumference, and was positively associated with ages 16, 17 and 18 + 19 years. Dissatisfaction with body image is highly prevalent among adolescents, though it is manifested differently in boys and girls. Increased abdominal fat, excess weight and female gender were predictors of dissatisfaction due to excess weight, and male gender and advanced age were predictors of dissatisfaction due to thinness.*

Key words Adolescent, Self-image, Body image, Nutritional status, Perception, Risk factors

Resumo *O objetivo deste artigo é verificar a prevalência de insatisfação com a imagem corporal e sua associação com fatores sociodemográficos e estado nutricional em adolescentes. Foram coletadas informações sociodemográficas, antropométricas e percepção da imagem corporal (n = 660). A prevalência de insatisfação corporal foi 71,4. As moças desejavam reduzir o tamanho da silhueta corporal, enquanto os rapazes desejavam aumentar. O desejo de reduzir a silhueta foi positivamente associado ao sexo feminino, à circunferência da cintura aumentada e ao excesso de peso. Por outro lado, o desejo de aumentar foi negativamente associado ao sexo feminino e circunferência da cintura aumentada, e positivamente associada às idades de 16, 17 e 18 + 19 anos. A insatisfação corporal é prevalente entre os adolescentes e é diferente entre sexos. Gordura abdominal aumentada, excesso de peso e sexo feminino foram preditores de insatisfação pelo excesso de peso; sexo masculino e idade mais avançada foram preditores de insatisfação pela magreza.*

Palavras-chave Adolescente, Autoimagem, Imagem corporal, Estado nutricional, Percepção, Fatores de Risco

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Introduction

Body image is characterized by one's mental perception of measures, contours and shapes of the body and parts of it and feelings associated with these characteristics¹. In addition, body image consists of a subjective component which refers to the individual's satisfaction with the size or specific parts of the body².

Adolescence is a period characterized by important biological, physical, psychological and social changes³, and body image disturbance, especially due to dissatisfaction with one's own body, is frequently observed during this phase of life⁴. Body image dissatisfaction is influenced by numerous factors (family, friends, media, society), but the main pressure seems to come from the media and society by imposing a "thin-ideal" for female beauty and an athletic image for males⁵. This pressure is exerted on the whole population but adolescents are more vulnerable to it.

Studies regarding the perception of body image in adolescents have elicited marked interest over the last few years both at the national^{6,7} and international level⁸. This interest is mainly due to the close relationship of body image dissatisfaction with psychological disorders and health-related risk behaviors⁹. In a recent study body image dissatisfaction was found to be the most important risk factor for manifestations of symptoms of anorexia nervosa in adolescents from a capital in the southern region of Brazil¹⁰. Evidence indicates that body image dissatisfaction is highly prevalent among adolescents^{6,7}.

Numerous researches have been conducted on body image in adolescents⁶⁻¹⁰, however, there are no studies that verify the association of two different levels of body image dissatisfaction (desire to reduce and to increase body size) with sociodemographic factors (age, gender and economic status) and anthropometric indicators (body mass index and waist circumference). In this sense, this study may contribute to the advancement of knowledge in healthcare, especially for the health care of adolescents. Thus, the objective of the present study was to determine the prevalence of body image dissatisfaction and its association with sociodemographic factors and nutritional status in adolescents aged 14 to 19 years.

Methods

Data from the project "Risk factors for atherosclerosis in adolescents", coordinated by mem-

bers of the Sports Center of the Federal University of Santa Catarina, in partnership with the Town Hall of Três de Maio, Rio Grande do Sul, Brazil, were used. A school-based cross-sectional epidemiological study was conducted in the urban zone of the town of Três de Maio, with data being collected between June and July 2006. The project was approved by the Ethics Committee on Human Research of the Federal University of Santa Catarina (protocol 41/2006), and the adolescents or responsible persons (in the case of minors) signed a free informed consent form.

Três de Maio is located in the northwestern region of the State of Rio Grande do Sul and belongs to the microregion of Santa Rosa. The estimated population is 24,136 inhabitants and the territorial area comprises 424.2 km². The human development index is 0.83¹¹, corresponding to high development according to the United Nations Development Programme¹².

The sample size was calculated considering a population of 1642 adolescents of both genders ranging in age from 14 to 19 years, who were regularly enrolled in public and private middle schools (last year, eighth grade), high schools and technical courses. A probabilistic sample stratified according to gender and proxy of economic status was established using the following parameters: 95% confidence interval (95% CI), tolerable sample error of 3.5%, prevalence of sedentarism of 40%, and design effect of 1.2¹³. The minimum sample size calculated was 624 adolescents.

Sampling was performed in two steps: i) stratification according to gender and a proxy of socioeconomic status; ii) drawing lots. In the latter case, participants were systematically selected from two lists of each school (one for each gender) according to the age group of the study. To guarantee the randomness of the sample the students were divided according to alphabetical order. The selection interval was established by dividing the total number of students on the list by the number of adolescents that should represent the school in the sample. This selection criterion permitted recomposition of the sample since in the case of absence from class on two consecutive days, lack of participation in the two sampling phases, refusal, transfer or school evasion another student was selected from the list according to the pre-established systematic sampling strategy. The final sample consisted of 660 adolescents (317 boys and 343 girls), 5.5% more than the calculated expected minimum sample size, in view of possible predicted blanks in the responses that would impair analysis of the variables studied.

Demographic data including age, gender and economic status were collected. The socioeconomic status of the family was classified using the Brazilian Economic Classification Criterion (divided into five levels from A to E, in decreasing order)¹⁴. The adolescents responded to this question at home together with the parents or responsible persons.

Data regarding body image perception were obtained using the figure rating scale proposed by Stunkard et al.¹⁵ and validated for the Brazilian population¹⁶. The set of silhouettes was shown to the subjects and the following questions were then asked: Which silhouette (current) best represents your current physical appearance? Which silhouette (ideal) would you like to have? Body image dissatisfaction was analyzed based on the discordance between the current and ideal silhouette and the subjects were classified as satisfied and dissatisfied. Next, subjects with body dissatisfaction were dichotomized into those who wished to increase their body size (dissatisfaction due to thinness) and those who wished to reduce their body size (dissatisfaction due to excess weight).

After the questionnaire was filled out, body weight and height were measured¹⁷. Nutritional status was evaluated based on body mass index ($BMI = \text{weight}/\text{height}^2$). The cut-off values for gender and age suggested by the International Obesity Task Force were used for the classification of BMI¹⁸. Waist circumference was measured using an anthropometric fiber glass tape (Mab-bis®) midway between the lowest rib and iliac crest¹⁹, and was classified as normal or increased according to the cut-off values recommended by Katzmarzyk²⁰.

Statistical analysis included the calculation of means, standard deviations and distribution of frequencies. The Student t-test for independent samples was used to evaluate differences in current and ideal silhouettes between genders. Nominal and ordinal variables were dichotomized or grouped into strata: gender (male, female), age group (14, 15, 16, 17 and 18 + 19 years), socioeconomic status (A + B, C, D + E), waist circumference (normal and increased), and nutritional status [eutrophic and excess weight (overweight + obesity)]. A frequency table (absolute and relative) was constructed to describe the distribution of categorical variables in the sample as a whole and according to gender. Frequencies were compared using the chi-square test.

The overall prevalence of body image dissatisfaction and the prevalence according to gender were calculated. Differences in prevalence were determined using a test for the comparison of two proportions. Since the dependent variable (perception of body image) consisted of three categories (satisfied, desire to reduce and desire to increase), multinomial logistic regression was used to estimate the association between body image dissatisfaction and the independent variables (gender, age group, socioeconomic status, nutritional status and waist circumference). The category "satisfied" was used as a reference. In all tests, the level of significance was set at 5% ($p \leq 0.05$ or 95% IC). Statistical analysis was performed using the SPSS® version 13.0 and MedCalc version 9.3.3.0 programs.

Results

The mean score for ideal figure rating was higher among adolescent boys (3.73 ± 0.93) than girls (2.68 ± 0.68 , $p < 0.001$). In contrast, no significant difference between genders was observed in the perception of current body silhouette (boys: 3.66 ± 1.38 ; girls: 3.54 ± 1.31 , $p = 0.278$).

Table 1 shows the distribution of the variables analyzed according to gender. Significant differences between genders were only observed for the proportions of the different categories of age and waist circumference.

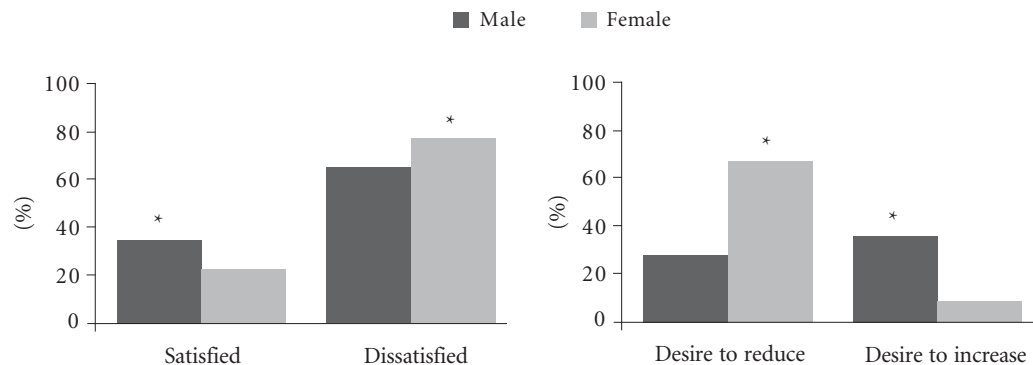
The distribution of the adolescents according to body image dissatisfaction and gender is shown in Figure 1. The percentage of dissatisfied subjects was higher among adolescent girls ($p < 0.05$) (Figure 1A). When the group of dissatisfied subjects was divided according to the desire to change body size (Figure 1B), the desire to reduce body size predominated among girls, whereas the wish to increase it was higher among boys, with significant differences between genders.

Table 2 shows the results of multiple regression analysis for the association between body image dissatisfaction (desire to increase and desire to reduce body size) and the independent variables (gender, age, socioeconomic status, waist circumference and nutritional status). The desire to reduce body size was positively associated with female gender, increased waist circumference and excess weight. The desire to increase body size was negatively associated with female gender and increased waist circumference, and was positively associated with ages 16, 17 and 18 + 19 years.

Table 1. Distribution of the variables analyzed according to gender (Três de Maio, RS, Brazil, 2006).

Variable	Boys (n = 343)		Girls (n = 317)		Total (n = 660)	
	n	%	n	%	n	%
Age (years)*						
14	39	12.3	78	22.7	117	17.7
15	86	27.1	73	21.3	159	24.1
16	73	23.0	85	24.8	158	23.9
17	69	21.8	77	22.4	146	22.1
18 + 19	50	15.8	30	8.7	80	12.1
Socioeconomic status						
A + B	123	38.8	117	34.1	240	36.4
C	150	47.3	163	47.2	312	47.3
D + E	44	13.9	64	18.7	108	16.4
Waist circumference*						
Normal	258	81.4	187	54.5	445	67.4
Increased	59	18.6	156	45.5	215	32.6
Nutritional status						
Eutrophic	266	83.9	296	86.3	562	85.2
Excess weight	51	16.1	47	13.7	98	14.8

*p < 0.05 for comparison of proportions between genders.



*p < 0.05 for comparison between genders.

Figure 1. Distribution of adolescents according to body image perception and gender (Três de Maio, RS, Brazil, 2006).

Discussion

The prevalence of body image dissatisfaction was high among adolescents from Três de Maio, Rio Grande do Sul (71.4%), demonstrating that the frequency of body dissatisfaction is high even among adolescents from small towns. The prevalence of body image dissatisfaction among adolescents observed in the present study was higher

than that reported by Pelegrini *et al.*⁶ (56.7%) and Petroski *et al.*⁷ (60.4%). These rates suggest that body dissatisfaction should be regarded an important public-health problem and should be included in the list of adolescent health issues, since this behavior can cause eating disorders (bulimia, anorexia), low self-esteem, and health-related risk attitudes and behaviors such as acceptance of poorly planned diets, exercise dependence and

Table 2. Multiple regression analysis of the association between body image dissatisfaction (desire to reduce or to increase body size) and the independent variables (reference category: satisfied with body image) (Três de Maio, RS, Brazil, 2006).

Variable	Reference category n	Desire to reduce		Desire to increase	
		n	OR* (95% CI)	n	OR* (95% CI)
Gender					
Male	111	91	1.00	115	1.00
Female	78	233	4.17 (2.60-6.69)	32	0.44 (0.27-0.74)
Age (years)					
14	39	65	1.00	13	1.00
15	41	80	1.31 (0.58-2.96)	38	2.29 (0.94-5.57)
16	45	79	1.23 (0.64-2.38)	34	2.35 (1.07-5.15)
17	42	63	0.75 (0.39-1.48)	41	2.21 (1.01-4.85)
18 + 19	22	37	0.76 (0.39-1.48)	21	2.85 (1.31-6.17)
Socioeconomic status					
A + B	65	119	1.00	56	1.00
C	96	151	1.04 (0.54-2.00)	65	1.12 (0.58-2.18)
D + E	28	54	0.74 (0.46-1.21)	26	0.80 (0.49-1.30)
Waist circumference					
Normal	172	129	1.00	144	1.00
Increased	17	195	7.76 (4.27-14.13)	3	0.26 (0.07-0.96)
Nutritional status					
Eutrophic	185	232	1.00	145	1.00
Excess weight	4	92	10.24 (3.26-32.17)	2	0.76 (0.13-4.47)

OR: odds ratio.

* Odds ratio simultaneously adjusted for all factors in the table.

consumption of weight-loss drugs^{21,22}. In addition, these conditions may have important negative repercussions on adult life and result in unmeasurable expenses for health services.

The present findings demonstrated a higher prevalence of body image dissatisfaction among adolescent girls, in agreement with Petroski et al.⁷. According to Williams et al.²³, females are generally more concerned about their body image, presenting greater dissatisfaction and weight gain concerns and preferring thin beauty ideals. Similarly, Gualdi-Russo et al.²⁴ and Knauss et al.⁸ found a greater body image dissatisfaction in young and adolescent girls.

Adolescent girls generally desired to reduce their body silhouette, whereas the desire to increase it predominated among boys. Similar results have been reported in the national⁷ and international^{21,25} literature, suggesting that in females body image dissatisfaction is more related to the desire to be thin, whereas in males body dissatisfaction is associated with the desire to gain muscle mass. One possible explanation for the differences in the presentation of body image dissatisfaction between genders might be a greater sociocultural

emphasis on physical attractiveness of adolescents in western societies, since internalization of a thin ideal (among girls) or athletic body (among boys) has been identified as a key component in the development of body dissatisfaction²⁵. However, this internalization, which is mainly influenced by the media, is not always reachable²⁶, a fact resulting in dissatisfaction and low self-esteem.

In the present study, increased waist circumference and inadequate nutritional status (overweight or obesity) were the strongest predictors of body dissatisfaction due to excess weight (desire to reduce body size). Thus, an elevated BMI and body fat distribution seem to be the main determinants of body dissatisfaction in adolescents. Other studies have shown a greater desire to reduce body size among adolescent girls with excess weight⁷. In general, the literature has shown that nutritional status, evaluated based on BMI, is not a consistent predictor of body dissatisfaction²⁷. Regarding body fat distribution (waist circumference), we found no studies investigating its association with body dissatisfaction.

On the other hand, body dissatisfaction due to the desire to increase body size was negatively

associated with increased waist circumference but not with excess weight. In addition, greater dissatisfaction due to thinness was observed among older adolescents, a finding suggesting that excessive concern with self-image tends to aggravate with age. However, the supposed risk of body dissatisfaction in older adolescents without excess abdominal fat is believed to be related to the fact that thin adolescents, especially boys, desire a more athletic and muscular body, but not a fatter one²¹. This fact might be related to both the need for self-affirmation among peers and the imposition of this beauty pattern by the media and society⁵.

The fact that body image dissatisfaction was not associated with socioeconomic status indicates that the risks of this outcome were the same for adolescents of high, middle and low social classes irrespective of gender, age, body fat distribution and nutritional status, demonstrating that body image dissatisfaction is a problem affecting adolescents of all social classes. Some authors support the view that the media, especially television, has been the major disseminator of these ideals²⁸.

The limitations of the present study are related to its cross-sectional cohort design, which does not permit the identification of a causal relationship between the variables analyzed and the use of an instrument (figure rating scale) for the determination of body image perception. Although this scale is easily and rapidly applied and has been widely used over the last years^{6,29}, the silhouette drawings are directly related to two-dimensional

linear shapes which may lead to failures in total body presentation, fat mass distribution and other aspects of body composition that are important for the formation of a body image³⁰. The advantages of the present study include the fact that the sample is representative of students from public and private schools in Três de Maio, Rio Grande do Sul. In addition, this is the first Brazilian study associating two different levels of body dissatisfaction (desire to increase and desire to reduce body size) with sociodemographic factors, nutritional status and body fat distribution.

Conclusions

The present results led us to conclude that: i) the prevalence of body image dissatisfaction is high among adolescents from the town of Três de Maio, especially among girls; ii) body dissatisfaction manifests differently in boys and girls; iii) increased abdominal fat, excess weight and female gender were predictors of body dissatisfaction due to excess weight (desire to reduce body size) and male gender and advanced age were predictors of body dissatisfaction due to thinness (desire to increase body size). In view of these conclusions, it is of fundamental importance that the school alerts adolescents to the risks of aggressive attitudes and behaviors aimed at weight loss or gain in muscle mass. Multidisciplinary interventions at school promoting healthy eating habits, physical activity and changes in body image concepts should be encouraged.

Collaborations

A Pelegriini, RS Coqueiro, CC Beck, KD Ghedin, AS Lopes and EL Petroski participated equally in all stages of preparation of the article.

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