



Original

Factors associated with body image dissatisfaction among adolescents in public schools students in Salvador, Brazil

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Abstract

Objective: To identify the prevalence of body image dissatisfaction and associated factors among students in Salvador, Brazil.

Methods: A cross-sectional study involving a random sample of 1,494 (852 girls and 642 boys) adolescents between 11 and 17 years of age who were students in the public schools in Salvador, Brazil. Participants completed the Body Shape Questionnaire and the Eating Attitudes Test-26. Body image was characterized as satisfactory or unsatisfactory. We obtained demographic, anthropometric and economic information and information regarding the stage of maturation, self-perception of body weight, and consumption of sweetened beverages and diet soft drinks. To identify associated factors we used Poisson regression analysis.

Results: Body image dissatisfaction was present in 19.5% of the adolescents, with a prevalence of 26.6% among the girls and 10% among the boys. Independent of sex, the prevalence of body image dissatisfaction was higher among adolescents who were overweight or obese (girls, PR: 1.38, CI: 1.09-1.73 and boys, PR: 2.26, CI: 1.08-4.75), higher among those who perceived themselves as fat (girls, PR: 2.85, CI: 2.07-3.93 and boys, PR: 3.17, CI: 1.39-7.23), and higher among those who had negative attitudes toward eating (girls, PR: 2.42, CI: 1.91-3.08 and boys, PR: 4.67, CI: 2.85-7.63). A reduction in body image dissatisfaction was only identified among underweight girls (PR: 0.12, CI: 0.03-0.49).

Conclusions: A high occurrence of body image dissatisfaction was observed among the adolescents, and biological and behavioral factors were associated with this dissatisfaction.

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Key words: *Body image dissatisfaction. Negative attitudes eating. Adolescent. Obesity.*

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LOS FACTORES ASOCIADOS CON LA INSATISFACCIÓN CORPORAL EN ADOLESCENTES DE ESCUELAS PÚBLICAS EN SALVADOR, BRASIL

Resumen

Objetivo: Identificar la prevalencia de insatisfacción corporal y factores asociados entre estudiantes de Salvador en Brasil.

Métodos: Estudio transversal realizado en una muestra aleatoria de 1494 adolescentes (852 niñas y 642 niños) de entre 11 y 17 años de edad estudiantes de escuelas públicas en Salvador (Brasil). Los participantes completaron los cuestionarios: Cuestionario de La Figura Corporal y el Inventario de Actitudes Alimentarias. La imagen corporal pudo ser considerada satisfactoria o insatisfactoria. Se obtuvieron datos demográficos, antropométricos y económicos e información sobre la etapa de maduración sexual, la auto-percepción del peso corporal y el consumo de bebidas azucaradas y gaseosas. Para identificar los factores asociados se utilizó el análisis de regresión de Poisson.

Resultados: La insatisfacción corporal estuvo presente en el 19,5% de los/as adolescentes, con una prevalencia del 26,6% entre las chicas y el 10% entre los chicos. Independientemente del sexo, la prevalencia de la insatisfacción corporal fue superior entre los/as adolescentes con sobrepeso u obesos (en las niñas, PR: 1,38, IC: 1,09-1,73 y en los niños, PR: 2,26, IC: 1,08-4,75), mayor entre los/as que percibían a sí mismos como "gordos" (en las niñas, PR: 2,85, IC: 2,07-3,93 y en los niños, PR: 3,17, IC: 1,39-7,23), y entre los/as que tenían actitudes alimentarias negativas (en las niñas, PR: 2,42, IC: 1,91-3,08 y en los niños, PR: 4,67, IC: 2,85-7,63). Una reducción en la insatisfacción corporal se identificó sólo entre las niñas con bajo peso (RP: 0,12, IC: 0,03-0,49).

Conclusiones: Se observó una alta ocurrencia de la insatisfacción corporal entre los adolescentes, y que factores biológicos y del comportamiento se asocian con dicha insatisfacción.

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Palabras clave: *Niños. Insatisfacción corporal. Actitudes alimentarias negativas. Adolescentes. Obesidad.*

Abbreviations

BID: Body image dissatisfaction.
BSQ: Body Shape Questionnaire.
BMI: Body Mass Index.
CI: Confidence interval.
EAT-26: Eating Attitudes Test-26.
PR: Prevalence ratio.

Introduction

Body image is a multifaceted construct that involves a person's perceptions, thoughts, and feelings about her or his body size, shape and structure.¹ In recent decades, excessive concern with the body image has been noted, and the prevalence of body image dissatisfaction (BID) has increased among adolescents.^{2,3,4}

Previous studies indicate that the prevalence of BID in developed countries is between 35% and 81% among female adolescents and between 16% and 55% among male adolescents.^{5,6} Despite the evidence based on data from developed countries, knowledge about the prevalence of BID and associated factors during adolescence in developing countries such as Brazil is scarce.^{2,7}

Body image dissatisfaction is a serious risk factor for eating disorders.⁸ It is possible that there is a bidirectional causal relationship between BID and disordered eating. Additionally, BID is a risk factor for compulsive eating, the adoption of improper eating attitudes and behaviors, and obesity.⁹ Some evidence indicates that biological factors, including age, sex, puberty, and body composition,^{10,11} along with psychological factors, including depression, low self-esteem, and adoption of weight-loss strategies,³ are conditions of risk for BID during adolescence. In addition, recent studies have shown an important association between BID and pressure from parents, friends, and mass media for the adolescent to achieve an ideal weight.^{3,11}

In recent decades, Brazil experienced an important epidemiological transition; chronic non-communicable diseases, such as obesity,¹² an important risk factor for the development of BID,³ the adoption of unhealthy eating behaviors,¹³ and eating disorders¹⁴ have increased. Evidence also indicates a relationship between geography and the occurrence of BID. For example Salvador, Brazil, the site of the current study, has a hot climate for the majority of the year and its entire coast is made up of beaches; these conditions encourage a large portion of the population to wear body-exposing light clothing, such as shorts and bikinis, fostering a greater concern with physical appearance. Considering the association of BID with disorders that compromise the health of adolescents, we hope with this study to identify the prevalence of BID and to evaluate its associated factors among students enrolled in the public school system of the City of Salvador, Brazil.

Methods

This was a cross-sectional study involving a random sample of adolescents of both sexes aged 11 to 17 who were enrolled in the public school system in the city of Salvador, capital of the state of Bahia. Salvador is one of the most affluent cities in northeast Brazil and has 2,676,606 residents.¹⁵ This study is a subproject of a broader investigation titled "Psychosocial factors as elements impacting the health, nutrition and cognitive development of students from the public schools of Salvador/BA".

Participants

The sampling process involved a complex design, structured in two stages: the first stage is represented by the schools, the second stage by the classes. To estimate the size of the sample, we used information supplied by the Department of Education of the State of Bahia for the 2007 school year, the most recent available at the time. In 2007, 77,873 adolescents matriculated, with 40% in the 7th year, 33% in the 8th year, and 27% in the 9th year of fundamental public schools in the City of Salvador. We assumed a BID prevalence of 18.8%.¹⁶ Thus, with a confidence level of 95% and a maximum admissible error of 2.5%, we estimated that we needed a minimum of 1,201 students for this investigation. Of the 207 schools functioning in 2007, we randomly selected 23. From these 23, an average of three classes per school (69 classes) were selected. All students who regularly attended the instructional unit, had authorization from their parents/guardians, and were aged between 11 and 17 years participated in the study. Excluded from the study were 81 students (from the 64 students who are 18 years old or older, 03 had physical problems, and 13 teenagers were pregnant and 01 lactating). In addition, 65 students did not attend school, 09 were absent during the period of data collection and 54 had their participation in the survey refused by their parents or guardians. In total, 1,561 students were evaluated. After review of the questionnaires and exclusion of 67 cases due to inconsistent data, the final sample was made up of 1,494 students (852 girls and 642 boys), more than the minimum necessary to investigate BID.

Parents or guardians who agreed to their child's participation signed the Agreement of Free and Informed Consent. Illiterate parents gave consent by means of their fingerprint. The study protocol was approved by the Ethics Committee of the Institute of Public Health at the Federal University of Bahia (protocol number 002/08).

Instruments and measures

Body image

The goal of the Body Shape Questionnaire (BSQ) is the identification of various aspects of dissatisfaction

or concern with weight and body image in the four weeks prior to the interview. The BSQ consists of 34 items rated on a Likert scale from 1 to 6. Based on their scores, the adolescents were classified into one of the following groups: satisfied with body image (scores ≤ 80); slightly dissatisfied (scores from 81 to 110); moderately dissatisfied (scores from 111 to 140), and seriously dissatisfied (scores > 140).¹⁷ The BSQ was translated into Portuguese¹⁸ and validated for Brazilian adolescents.¹⁹ The Cronbach's alpha coefficient (α) was 0.96, and this was independent of sex. The internal consistency in the current study was 0.95. This scale was correlated with Body Mass Index in the validation study sample ($r = 0.41$, $p < 0.01$).¹⁹

Disordered eating

The Eating Attitudes Test-26 (EAT-26) evaluates attitudes towards eating and includes three scales: 1) the diet scale; 2) the scale for bulimia and concern with consumption of food; and 3) the scale for oral control. The 26 items on this test are rated on four-point Likert scales from 0 to 3.²⁰ A total of 21 points or more is indicative of the presence of negative attitudes towards eating, and scores equal to or below 20 indicate the absence of such negative attitudes.²¹ The EAT-26 was translated into Portuguese by Nunes et al.²² and validated for the Brazilian population with an internal consistency of $\alpha = 0.75$.²¹ In this study the internal consistency was 0.84.

Perception of body image

In this study, self-perception of body weight was evaluated through the question "How do you feel in relation to your weight?". Available responses included the following: very fat, fat, normal, underweight, and very underweight. For the statistical analyses, we decided to categorize self-perception of image into the following groups: fat (fat/very fat), normal, and underweight (underweight/very underweight).

Physical exam

Weight was determined using a Master® portable digital scale, and height was determined using a portable stadiometer (Leicester Height Measure®). The measurements were repeated, and the technical recommendations of Lohman, Roche & Martorell²³ were adopted. The Body Mass Index was used to classify the anthropometric state of each adolescent into one of the following categories: underweight (BMI below the 3rd percentile), normal weight (between the 3rd and 85th percentiles), overweight (between the 85th and 97th percentiles) and obese (above the 97th percentile).²⁴ BMI percentile calcula-

tions were based on the appropriate age and sex of each adolescent.

Pubertal development was assessed by means of male and female sexual characteristics, as well as age of menarche for girls. As to adolescent girls, of the onset of pubescence was defined on the basis of the Tanner stage II for breast glands and post-pubescence by menarche. For boys, stage III for genital development set the onset of puberal growth spurt and stage V marked the late pubescence.²⁵

Food consumption

Ingestion of sweetened beverages and diet soft drinks was evaluated by means of a Food Frequency Questionnaire (97-item) for adolescents adapted from Slater et al.²⁶ Possible answers included the following: "never or rarely", "one to three times a month", "once a week", "two to four times a week", and "four or more times a week". The number of these items consumed per day was also investigated.

Economic and demographic characteristics

To classify the economic conditions of each family, the Brazil Criterion for Economic Classification was used. This measure includes the level of education of the head of the family, the number of employees with a salary and nine more items related to material goods.²⁷ The birth dates for the students were obtained from school records, and age in years was calculated by subtracting the date of birth from the date of the interview.

Procedure

The data were collected between July and December 2009 in a school environment by ten interviewers trained and qualified to conduct the study activities. The managers of the 23 chosen schools received an invitation letter to participate in the study. Meetings explaining the goals and stages of the study were held with directors, teachers, and parents of the students. At this time, it was also explained that the participation was completely voluntary.

Information regarding the economic conditions of each family was supplied by the parents; the rest of the information acquired (sex, body image, eating attitudes, self-perception of body weight, pubertal development, and food consumption) was self-reported by the adolescents and recorded on the appropriate forms. Interviewers showing the adolescents how to complete the psychometrics tests and Food Frequency Questionnaire. Anthropometric measurements were obtained by four nutritionists and the socioeconomic information was provided by the parent or guardian. Data collection was performed in appropriate locations previously identified by the schools.

Statistical analysis

Body image dissatisfaction was the main dependent variable, and each student was categorized as being either satisfied with their body image (category 0) or dissatisfied with their body image (category 1). The independent variables included age (11-12 years old = 0, 13-15 years old_{Dummy1} = 1 e 16-17 years old_{Dummy2} = 2), economic condition (0 = worst condition, better condition = 1), pubertal development (prepubertal or pubertal = 0; postpubertal = 1), anthropometric state (normal weight = 0, underweight_{Dummy1} = 1 and overweight or obese_{Dummy2} = 2), self-perception of body weight (normal = 0; underweigh_{Dummy1} = 1; fat_{Dummy2} = 2), negative attitudes eating (absent = 0, present = 1), diet soft drinks (< 4 times/week = 0, ≥ 4 times/week = 1), sweetened beverages (< 4 times/week = 0, ≥ 4 times/week = 1).

The chi-squared test and differences in averages were used for categorical and continuous variables, respectively, to characterize the population of the study. To evaluate associations between the measured factors and BID, Poisson regressions were performed with the program Stata, version 10.0. The modeling process was based on an ordered strategy that consisted of the following two stages: 1) bivariate analyses that indicated which variables to include in the multivariate model (variables with a p-value less than 0.20), and 2) multivariate analysis including all of the variables pre-selected in the bivariate analysis; those with p-values less than 0.05 remained in the final model. The prevalence ratios (PR) and their respective 95% confidence intervals (CI 95%) were used to evaluate the association and strength of association between the variables investigated, respectively. These analyses were conducted independently for each sex.

Table I
Demographic economic, biological and behaviours characteristics by gender among students of public schools

Variables	Girls (n = 852) %	Boys (n = 642) %	P*
Age (years)			< 0.011
11-12	21.5	19.4	
13-15	63.8	60	
16-17	14.7	20.6	
Pubertal development			< 0.001
Prepubertal/pubertal	19.7	86.1	
Postpubertal	80.3	13.9	
Anthropometric state			0.006
Underweight	6.2	10.4	
Normal weight	80.1	73.4	
Overweight	8.5	9.2	
Obese	5.2	7	
Economic condition			0.358
Worst economic conditions	50.9	48.5	
Better economic conditions	49.1	51.5	
Self-perception of body weight			< 0.001
Underweight	17.9	22.4	
Normal weight	58.5	65.4	
Fat	23.6	12.2	
Sweetened beverages (times/week)			0.513
< 4	59.6	61.3	
> 4	40.4	38.8	
Diet soft drinks (times/week)			0.379
< 4	91.1	92.3	
> 4	8.9	7.7	
Negative eating attitudes			< 0.001
Absent	81.9	88.6	
Present	18.1	11.6	

Female: Missing data – Economic Condition: 25, Pubertal development: 1 and Sweetened beverages: 1

Male: Missing data - Economic Condition: 23, Pubertal development: 4 and Sweetened beverages: 2

*Chi-squared analysis.

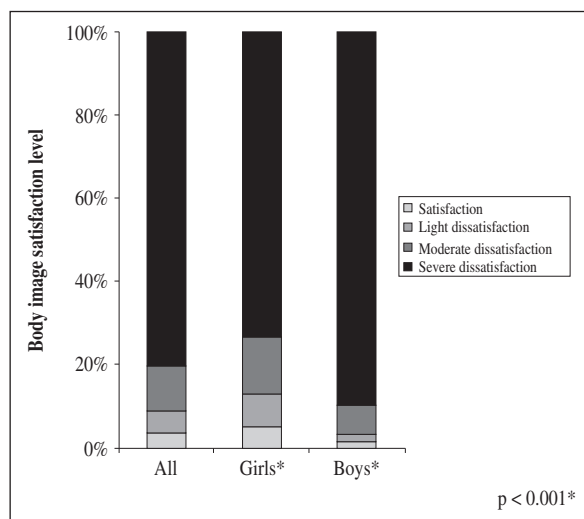


Fig. 1.—Prevalence of body image satisfaction level among students of public schools. *Chi squared analysis.

Results

The demographic, economic, biological, and behavioral characteristics of the participants in the study are presented in table I. The average BSQ score for the population was 62.4 (SD = 30.7), and for the sexes were 54.1 (SD = 22.8) and 68.7 (SD = 34.1) for boys and girls, respectively. This difference between the sexes was significant ($p < 0.001$). Body image dissatisfaction was identified in 19.5% of the students (26.6% and 10% of girls and boys, respectively). A mild degree of BID was observed in 6.5% of boys and 13.5% of girls, moderate BID was observed in 1.9% of boys and 7.8% of girls, and serious BID was identified in 1.6% of boys and 5.3% of girls (fig. 1).

The correlation between BMI and BSQ ($r = 0.22-0.45$, $p < 0.001$) was significant, independent of sex. Analyses of the distribution of BID and perception of body mass according to anthropometric state and sex

are presented in table II. Among overweight adolescents, 58.3% of girls and 22% of boys reported BID, and among those who were obese, BID was observed in 61.4% and 44.4% of girls and boys, respectively. The adolescents did not always have an accurate perception of their body weight; among normal-weight girls, 17.9% believed that they were fat, and 37.5% and 22.7% of overweight and obese participants, respectively, believed themselves to be of appropriate weight. Only 4.2% of normal-weight boys perceived themselves as fat. Among overweight or obese boys, 54.2% and 24.4%, respectively, believed themselves to be of appropriate weight (table II).

Results from the bivariate analyses of the Poisson regression according to sex indicated that higher prevalence of BID was found among adolescents who were overweight or obese (girls, PR: 2.68, CI: 2.15-3.35, and boys, PR: 5.36, CI: 3.24-8.88), who believed that they were fat (girls, PR: 4.37, CI: 3.29-5.8, and boys, PR: 6.41, CI: 3.67-11.19), or had negative attitudes towards eating (girls, PR: 3.79, CI: 3.05-4.73, and boys, PR: 9.60, CI: 4.92-18.74). Ingestion of low-calorie soft drinks (PR: 1.53, CI: 1.10-2.13) was positively and significantly associated with BID only among girls. Statistically significant associations were not observed between BID prevalence and the other variables investigated in this study (table III).

The results of multivariate statistical analyses, illustrated in table IV, indicate that BID prevalence was positively associated with overweight or obesity among girls (PR: 1.38, CI: 1.09-1.73) and boys (PR: 2.26, CI: 1.08-4.75). Body image dissatisfaction was less prevalent among girls (PR: 2.85, CI: 2.07-3.93) than boys (PR: 3.17, CI: 1.39-7.23) who considered themselves to be fat. Similarly, among those with negative attitudes towards eating, BID was less prevalent in girls than boys (girls, PR: 2.42, CI: 1.91-3.08 and boys, PR: 4.67, CI: 2.85-7.63). Being underweight reduced the occurrence of BID by 88% (PR: 0.12, CI: 0.03-0.49), but only among girls.

Table II

Body image and self-perceived of body weight by gender and anthropometric state among students of state public schools

Behaviours	Girl's anthropometric state (n = 852)				p*	Boy's anthropometric state (n = 642)				p*
	Underweight n = 53	Normal weight n = 683	Overweight n = 72	Obese n = 44		Underweight n = 67	Normal weight n = 471	Overweight n = 59	Obese n = 45	
Body image					<0.001					<0.001
Satisfaction	94.3	77.3	41.7	38.6		94	94.3	78	55.6	
Dissatisfaction	5.7	22.7	58.3	61.4		6	5.7	22	44.4	
Self-perception of body weight					<0.001					<0.001
Underweight	69.8	17	–	–		68.7	20.2	3.4	2.2	
Normal weight	30.2	65.2	37.5	22.7		31.3	75.6	54.2	24.4	
Fat	–	17.9	62.5	77.3		–	4.2	42.4	73.3	

*Chi-squared analysis.

Table III
Crude prevalence ratio for the association between exposure and outcome variables among students of public schools

Variables	Girls (n = 852) PR _{crude} (95% IC)	Boys (n = 642) PR _{crude} (95% IC)
<i>Age (years)</i>		
11-12	1	1
13-15	1.21 (0.87-1.67)	1.51 (0.72-3.49)
16-17	1.25 (0.81-1.93)	1.24 (0.51-3.03)
<i>Pubertal development</i>		
Prepubertal/pubertal	1	1
Postpubertal	1.42 (0.99-2.03)	1.01 (0.50-2.05)
<i>Anthropometric state</i>		
Normal weight	1	1
Underweight	0.29 (0.08-1.01)	0.89 (0.31-2.59)
Overweight or obese	2.68 (2.15-3.35)	5.36 (3.24-8.88)
<i>Economic Condition</i>		
Worst economic conditions	1	1
Better economic conditions	1.08 (0.84-1.39)	0.88 (0.52-1.46)
<i>Self-perception of body weight</i>		
Normal weight	1	1
Underweight	1.13 (0.70-1.79)	1.65 (0.78-3.49)
Fat	4.37 (3.29-5.80)	6.41 (3.67-11.19)
<i>Sweetened beverages (times/week)</i>		
< 4	1	1
> 4	1.03 (0.79-1.34)	1.32 (0.79-2.19)
<i>Diet soft drinks (times/week)</i>		
< 4	1	1
> 4	1.53 (1.10-2.13)	1.09 (0.44-2.73)
<i>Negative eating attitudes</i>		
Absent	1	1
Present	3.79 (3.05-4.73)	9.60 (4.92-18.74)

95% CI: 95% Confidence Interval.

Girls: Missing data – Economic Condition: 25, Pubertal development: 1 and Sweetened beverages: 1.

Boys: Missing data - Economic Condition: 23, Pubertal development: 4 and Sweetened beverages: 2.

Discussion

The prevalence of BID among adolescents (19.5%) estimated in this study is lower than that recorded for other Brazilian studies^{2,19} or for adolescents from Mexico,²⁸ the United States,⁶ Jordan⁴ and Spain,²⁹ but higher than the estimates for adolescents from Israel.³⁰ These differences may be attributable to the use of different methodological instruments for the identification of BID, the cut-off point used to define BID, and/or socio-cultural and demographic characteristics inherent to the populations.

There is a general consensus that the prevalence of BID is high among adolescents, especially girls,^{5,11} which was also observed in the present study. It is possible that the greater increases in BID prevalence among girls than boys during puberty are attributable to the rapid weight gain (principally in the form of fat)

that occurs in this phase.¹⁰ This weight gain could make girls more vulnerable than boys to social pressure to mold their bodies to fit the ideal of slenderness.⁵

In the present study, we evaluated the relationship between anthropometric state and body perception. The proportion of overweight or obese subjects who considered their weight to be normal was greater among boys. In contrast, the proportion of normal-weight subjects who perceived themselves as overweight was higher among girls than boys. The results of this study were similar to those observed by White, Hilary Cintra⁷ and adolescents living in São Paulo, which found greater underestimation of body weight among boys and overestimation among girls.

The results of this study also indicate that, independent of sex, BID prevalence was higher among adolescents who were overweight or obese, who perceived themselves as fat, or who had negative eating attitudes.

Table IV
Adjusted Prevalence Ratio for the association between exposure and outcome variables among students of public schools

Variables	Girls (n = 852) PR _{adjusted} (95% IC)	Boys (n = 642) PR _{adjusted} (95% IC)
<i>Anthropometric state</i>		
Normal weight	1	1
Underweight	0.12 (0.03-0.49)	0.61 (0.19-1.85)
Overweight or obese	1.38 (1.09-1.73)	2.26 (1.08-4.75)
<i>Self-perception of body weight</i>		
Normal weight	1	1
Underweight	0.97 (0.63-1.50)	1.03 (0.50-2.14)
Fat	2.85 (2.07-3.93)	3.17 (1.39-7.23)
<i>Negative eating attitudes</i>		
Absent	1	1
Present	2.42 (1.91-3.08)	4.67 (2.85-7.63)

PR_{adjusted} = Adjusted Prevalence Ratio.

*Adjusted for Pubertal development and Economic Condition.

95% CI: 95% Confidence Interval.

Girls: Missing data – Economic Condition: 25, Pubertal development: 1.

Boys: Missing data - Economic Condition: 23, Pubertal development: 4.

Only among girls was being underweight negatively associated with the prevalence of BID.

Consistent with earlier studies,^{3,11} measured BMI was significantly associated with BID in both sexes. Obesity has been stigmatized in contemporary society, and a slim and/or muscular body is viewed as the ideal of beauty. This standard of beauty puts individuals with excess weight in conflict with the current norms established by society, making them vulnerable to BID.^{3,11}

Thus, obesity during adolescence is recognized as a risk factor for the adoption of improper behaviors for weight control,^{31,32} anxiety,³³ and depression;³⁴ these conditions can favor sustained BID.

It is worth emphasizing that the relationship between obesity and BID may be bidirectional. BID is associated with improper eating behaviors aimed at weight loss that may increase sensations of hunger and the risk of compulsive eating, which in turn contribute to overweight.⁹ The evidence supporting an association between BID and overweight is more worrying in light of recent findings regarding the high prevalence of overweight and obesity among Brazilian adolescents, both males (21.7% and 5.9%, respectively) and females (19.4% and 4%, respectively).¹²

Only among girls was slenderness negatively and significantly associated with BID, indicating that slender girls are more satisfied with their bodies than normal or overweight girls. This indirectly suggests that girls' satisfaction with their bodies corresponds to the physical ideal of beauty established by society for women - a slender body.¹¹

We also found that the prevalence of BID in both sexes was higher among students who considered themselves to be fat. A study conducted in São Paulo (SP) with adolescents aged 14 to 19 years recorded a

higher prevalence of BID among those who believed that they were overweight or obese, regardless of sex.⁷

Negative eating attitudes were also correlated with an increased prevalence of BID in both sexes. Body image dissatisfaction can trigger eating disorders³⁵ and disturbances related to eating behaviors, such as fasting, purging, excessive physical exercise, and a restrictive diet.⁹ The results of prospective investigations indicate that the adoption of these strategies can result in loss of control over ingestion of food, which in turn leads to weight gain.^{34,36} Failure to meet goals and expectations regarding weight loss can create feelings of disappointment or failure, which contribute to increases in BID.^{4,6}

In this study, we did not observe an association between age and BID; this agrees with the results of a study performed with children aged 8 to 11 years living in Porto Alegre, Brazil.² Other variables (pubertal development, economic condition, and consumption of diet soft drinks and sweetened beverages) were not significantly associated with BID in either sex. Regarding the association between economic condition and BID, data from the literature disagree. A longitudinal study indicated that socioeconomic status is associated with BID,³ while cross-sectional studies have failed to identify this association.^{2,4} In the present study, the sample was homogeneous with respect to economic condition; this homogeneity can be explained by the character of the public school from which the sample was taken.

It is noted that this study has limitations inherent to cross-sectional design because it estimated relationships between variables, outcome and exposure in a single moment. The temporal sequence of events was not considered, and therefore, the cause and effect could not be identified. However, the results are

supported by other studies that demonstrated the association between the response variable and biological and behavioural variables.

Conclusions

We conclude that BID is prevalent among adolescents enrolled in the public state schools of Salvador, Brazil. Our results indicate that, among factors with a potential influence on BID, overweight or obesity, slenderness, the self-perception of being fat, and negative eating attitudes should be given special attention. For boys, the factors deserving attention include overweight or obesity, the perception of being fat, and negative eating attitudes. Thus, the results of this study highlight the need to develop health-promoting measures that take into account aspects inherent to adolescence and to involve the school and home environment in the development of non-distorted body image among Brazilian students.

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References

1. Grogan S. Body image and health: contemporary perspectives. *J Health Psychol* 2006; 11: 523-30.
2. Pinheiro AP, Giugliani ERJ. Body dissatisfaction in Brazilian schoolchildren: prevalence and associated factors. *Rev Saúde Pública* 2006; 40: 489-96.
3. Paxton SJ, Eisenberg ME, Neumark-Sztainer D. Prospective predictors of body dissatisfaction in adolescent girls and boys: a five-year longitudinal study. *Dev Psychol* 2006; 42: 888-99.
4. Mousa TY, Mashal RH, Al-Domi HA, Jibril MA. Body image dissatisfaction among adolescent schoolgirls in Jordan. *Body Image* 2010a; 7: 46-50.
5. Lawler M, Nixon E. Body dissatisfaction among adolescent boys and girls: the effects of body mass, peer appearance

culture and internalization of appearance ideals. *J Youth Adolesc* 2011; 40: 59-71.

6. Bearman SK, Martinez E, Stice E, Presnell K. The Skinny on Body Dissatisfaction: A Longitudinal Study of Adolescent Girls and Boys. *J Youth Adolesc* 2006; 35: 217-29.
7. Branco LM, Hilário MOE, Cintra IP. Body perception and satisfaction in adolescents and its relationship with nutritional status. *Rev Psiquiatr Clín* 2006; 33: 292-6.
8. Stice E, Ng J, Shaw H. Risk factors and prodromal eating pathology. *J Child Psycho Psychiatry* 2010; 51: 518-25.
9. Neumark-Sztainer D, Paxton SJ, Hannan PJ, Haines J, Story M. Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *J Adolesc Health* 2006; 39: 244-51.
10. Markey CN: Invited commentary. Why body image is important to adolescent development. *J Youth Adolesc* 2010; 39: 1387-91.
11. Xu X, Mellor D, Kiehne M, Ricciardelli LA, McCabe MP, Xu Y. Body dissatisfaction, engagement in body change behaviors and sociocultural influences on body image among Chinese adolescents. *Body Image* 2010; 7: 156-64.
12. Brazilian Institute of Geography and Statistics - IBGE. POF 2008-2009: Anthropometry and nutritional status of children, adolescents and adults in Brazil. Available from: http://www.ibge.gov.br/home/estatistica/populacao/condicaoedevida/pof/2008_2009_encaa/pof_20082009_encaa.pdf; cited 2011 Mar 5.
13. Espinoza P, Penelo E, Raich RM. Disordered eating behaviors and body image in a longitudinal pilot study of adolescent girls: what happens 2 years later? *Body Image* 2010; 7: 70-3.
14. Doyle AC, Le GD, Goldschmidt A, Wilfley DE. Psychosocial and physical impairment in overweight adolescents at high risk for eating disorders. *Obesity (Silver Spring)* 2007; 15: 145-54.
15. Brazilian Institute of Geography and Statistics - IBGE. Brazilian Census 2010. Available from: <http://www.ibge.gov.br/home/estatistica/populacao/censo2010>; cited 2011 May 5.
16. Alves E, Vasconcelos FAG, Calvo MCM, Neves J. Prevalência de sintomas de anorexia nervosa e insatisfação com a imagem corporal em adolescentes do sexo feminino do Município de Florianópolis, Santa Catarina, Brasil. *Cad Saúde Públ* 2008; 24: 503-12.
17. Cooper PJ, Taylor MJ, Cooper Z, Fairbum CG. The development and validation of the body shape questionnaire. *Int J Eat Disord* 1987; 6: 485-94.
18. Cordás TA, Castilho S. Body image for eating disorders - assessment instruments: "Body Shape Questionnaire". *Psiquiatr Biol* 1994; 2: 17-21.
19. Conti MA, Cordás TA, Latorre MRDO. A study of the validity and reliability of the Brazilian version of the Body Shape Questionnaire (BSQ) among adolescents. *Rev Bras Saúde Mater Infant* 2009; 9: 331-8.
20. Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The Eating Attitudes Test: psychometric features and clinical correlates. *Psychol Med* 1982; 12: 871-8.
21. Nunes MA, Camey S, Olinto MTA, Mari JJ. The validity and 4-year test-retest reliability of the Brazilian version of the Eating Attitudes Test-26. *Braz J Med Biol Res* 2005; 38: 1655-62.
22. Nunes MA, Bagatini LF, Abuchaim AL, Kunz A, Ramos D, Silva JA et al. Eating disorders: considerations about the Eating Attitudes Test (EAT). *Rev ABP-APAL* 1994; 16: 7-10.
23. Lohman TG, Roche AF, Martorell R: Anthropometric standardization reference manual. Abridged; Champaign, IL : Human Kinetics Books; 1988.
24. World Health Organization. Growth reference data for 5-19 years, WHO reference 2007. World Health Organization, 2007. Available from: http://www.who.int/growthref/who2007_bmi_for_age/en/index.html; cited 2007 September 20.
25. World Health Organization (WHO). Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. World Health Organization Tech.Rep.Ser. 854, 1-452. World Health Organization, 1995.
26. Slater B, Philippi ST, Fisberg RM, Latorre MRDO. Validation of a semi-quantitative adolescent food frequency questionnaire

- applied at a public school in Sao Paulo, Brazil. *Eur J Clin Nutr* 2003; 57: 629-35.
27. Associação Brasileira de Empresas de Pesquisa - ABEP. Critério de Classificação Econômica Brasil 2008. Available from: <http://www.abep.org.br/novo/Content.aspx?ContentID=302>; cited 2009 Jul 2.
 28. Moreno González MA, Ortiz Viveros GR. Eating disorder and its relationship with body image and self-esteem in adolescents. *Rev Psicol* 2009; 27: 181-90.
 29. Jáuregui-Lobera I, Bolaños-Ríos P, Santiago-Fernández MJ, Garrido Casals O, Sánchez E. Perception of weight and psychological variables in a sample of Spanish adolescents. *Diabetes Metab Syndr Obes* 2011; 4: 245-51.
 30. Latzer Y, Tzischinsky O, Azaiza F. Disordered eating related behaviors among Arab schoolgirls in Israel: An epidemiological study. *Int J Eat Disord* 2007; 40: 263-70.
 31. Souza Ferreira JE, Veiga GV. Eating disorder risk behavior in Brazilian adolescents from low socio-economic level. *Appetite* 2008; 51: 249-55.
 32. Al SH, Vereecken C, Abdeen Z, Kelly C, Ojala K, Nemeth A et al. Weight control behaviors among overweight, normal weight and underweight adolescents in Palestine: findings from the national study of Palestinian schoolchildren (HBSC-WBG2004). *Int J Eat Disord* 2010; 43: 326-36.
 33. Babio N, Canals J, Pietrobelli A, Perez S, Arija V. A two-phase population study: relationships between overweight, body composition and risk of eating disorders. *Nutr Hosp* 2009; 24: 485-91.
 34. Goldschmidt AB, Aspen VP, Sinton MM, Tanofsky-Kraff M, Wilfley DE. Disordered Eating Attitudes and Behaviors in Overweight Youth. *Obesity* 2008; 16: 257-64.
 35. Mousa TY, Al-Domi HA, Mashal RH, Jibril MA. Eating disturbances among adolescent schoolgirls in Jordan. *Appetite* 2010b; 54: 196-201.
 36. Neumark-Sztainer D, Wall M, Guo J, Story M, Haines J, Eisenberg M. Obesity, Disordered Eating, and Eating Disorders in a Longitudinal Study of Adolescents: How Do Dieters Fare 5 Years Later? *J Am Diet Assoc* 2006; 106: 559-68.