

Body satisfaction and associated factors among high school students

Satisfação com o peso corporal e fatores associados em estudantes do ensino médio

Satisfacción con el peso corporal y factores asociados en estudiantes de secundaria

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ABSTRACT

Objective: To analyze body satisfaction among students and its possible associations with nutritional status, socio-demographic factors, life style and health perception.

Methods: This cross-sectional study enrolled students aged 15 to 20 years of public schools from the city of Caruaru, North-east Brazil. Anthropometric, socio-demographic, life style and health perception, sleep, stress and body image variables were evaluated. The body mass index for gender and age was used to diagnose underweight, and overweight according to Conde and Monteiro (2006). Binary logistic regression was applied with the occurrence of “dissatisfaction with thinness” and “dissatisfaction with excess weight” as outcomes.

Results: 594 students (62% females) aged 17.5±1.6 years old were studied. A proportion of 38.7% (95%CI 34.8-42.7) were satisfied with their body weight, while 31.3% (95%CI 27.6-35.2) would like to increase it and 30.0% (95%CI 26.3-33.8) would like to reduce it. The students who were satisfied with their weight ate at least five servings of vegetables/day, three or more meals/day, and they had a positive perception of sleep. Males and individuals with low weight expressed the desire to increase their body weight, while females, students who have less than three meals/day, students with higher income, and those with overweight would like to reduce their weight. Among the males who would like to increase their body weight 13.5% had overweight and 18.8% of the females who desired to reduce their weight were underweight.

Conclusions: Preventive measures that include the discussion about body culture and health damage risks are needed. These measures should target genders' specificities.

Key-Words: body image; adolescent; nutritional status.

RESUMO

Objetivo: Investigar a satisfação corporal em estudantes e possíveis associações ao estado nutricional, fatores sociodemográficos, estilo de vida e percepção de saúde.

Métodos: Estudo transversal realizado com estudantes de 15 a 20 anos de idade de escolas públicas do município de Caruaru (PE). Foram avaliadas variáveis antropométricas, sociodemográficas, de estilo de vida e percepção de saúde, sono, estresse e imagem corporal. Utilizou-se o índice de massa corporal por gênero e idade para diagnosticar baixo peso, eutrofia e excesso de peso, segundo o critério de Conde e Monteiro (2006). Na análise multivariada, recorreu-se à regressão logística binária, adotando-se a ocorrência de “insatisfação pela magreza” e de “insatisfação pelo excesso” como desfechos.

Resultados: Amostra composta por 594 estudantes (62% moças), com idade média de 17,5±1,6 anos. Uma proporção de 38,7% (IC95% 34,8-42,7) afirmou estar satisfeito com o peso corporal, enquanto 31,3% (IC95% 27,6-35,2) gostariam de aumentar e 30,0% (IC95% 26,3-33,8) de reduzir o peso. Estudantes satisfeitos com o peso corporal consumiam pelo menos cinco porções de vegetais/dia, possuíam percepção posi-

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tiva de sono e realizavam três ou mais refeições/dia. Rapazes e indivíduos com baixo peso apresentaram o desejo de aumentar o peso, enquanto moças, estudantes que realizavam menos de três refeições/dia, com maior renda e excesso de peso gostariam de reduzi-lo. Entre os rapazes que gostariam de aumentar o peso, 13,5% apresentavam excesso de peso e 18,8% das moças que queriam reduzir o peso estavam com baixo peso.

Conclusões: Há necessidade de realizar medidas preventivas que visem esclarecer sobre a cultura do corpo e o risco de danos à saúde, conduzidas de forma independente para cada sexo.

Palavras-chave: imagem corporal; adolescente; estado nutricional.

RESUMEN

Objetivo: Investigar la satisfacción corporal en estudiantes y posibles asociaciones con el estado nutricional, factores socio demográficos, estilo de vida y percepción de salud.

Métodos: Estudio transversal de estudiantes de 15-20 años de escuelas públicas del municipio de Caruaru - Pernambuco, Brasil. Se evaluaron variables antropométricas, socio demográficas, de estilo de vida y percepción de salud, sueño, estrés e imagen corporal. Se utilizó el índice de masa corporal (IMC) por género y edad para diagnosticar bajo peso, eutrofia y exceso de peso, según el criterio de Conde y Monteiro (2006). En el análisis multivariado, se recurrió a la regresión logística binaria, adoptando la ocurrencia de “insatisfacción por la delgadez” e “insatisfacción por el exceso” como desenlaces.

Resultados: Muestra compuesta por 594 estudiantes (62,0% muchachas), con promedio de edad de 17,5±1,6 años. Una proporción de 38,7% (IC 95% 34,8-42,7) afirmó estar satisfecho con el peso corporal, mientras que a 31,3% (IC 95% 27,6-35,2) le gustaría aumentar y a 30,0% (IC 95% 26,3-33,8) le gustaría reducir el peso. Estudiantes satisfechos con el peso corporal consumen como mínimo cinco porciones de vegetales/día, poseen percepción positiva de sueño y realizan tres o más comidas/día. Muchachos e individuos con bajo peso presentaron el deseo de aumentar el peso, mientras que a muchachas, estudiantes que realizan menos de tres comidas/día, mayores ingresos y exceso de peso les gustaría reducir el peso. Entre los muchachos a quienes les gustaría aumentar el peso, 13,5% presentaban exceso de peso y 18,8% a quienes les gustaría reducir el peso estaban con bajo peso.

Conclusiones: Hay la necesidad de medidas preventivas con el objetivo de aclarar sobre la cultura del cuerpo y el riesgo de daños a la salud, conducidas de modo independiente para cada sexo.

Palabras clave: imagen corporal; adolescentes; estado nutricional.

Introduction

Determination of body image is influenced by highly complex biophysical, psychological, environmental, and behavioral components⁽¹⁾. According to Saikali *et al*, the concept of body image involves three components: (a) perceptive, which concerns perceptions of one's physical appearance, involving estimation of body weight and size; (b) subjective, which concerns appearance; (c) and behavioral, which comprises situations avoided by the individual as a means of avoiding discomfort associated with his or her appearance⁽²⁾. Social factors, cultural influences, pressure from the media, and the search for an ideal body appear to be determinants of body-image distortion, particularly among adolescents⁽³⁾.

Adolescence may be defined as the transitional period between childhood and adulthood, which takes place between the ages of 10 and 19⁽⁴⁾. It is characterized by profound biological and psychosocial changes that involve intense growth and development⁽⁵⁾. In the midst of hormonal, functional, affective, and social transformations, changes in physical build and bodily appearance take on an essential role⁽⁶⁾, particularly during the period of physical change and budding development of secondary sexual characteristics that is adolescence⁽⁷⁾.

The culture of thinness imposes values and standards which, in turn, are conditioning factors of attitudes and behaviors related to appearance, body size, and overvaluation thereof⁽⁷⁾, leading to feelings of discontent regarding one's body. Body image dissatisfaction is associated with overweight and obesity^(8,9); with changes in body weight⁽¹⁰⁾; with gender (particularly female)^(11,3); and with maternal perceptions of their children's nutritional status in childhood and early adolescence⁽¹²⁾.

Body image dissatisfaction may act as a driver of beneficial behavior, triggering adoption of healthy lifestyle habits such as a healthy diet and physical activity, and may thus lead to biophysical changes and improved perceptions of one's body⁽¹⁾. In adolescence, however, body image dissatisfaction often leads to adoption of aberrant dietary habits and inadequate weight management practices, such as self-medication with diuretics and laxatives, purging, and exercising to exhaustion⁽¹³⁾.

Physical and cognitive development may be hindered in adolescents and young adults who engage in inadequate behaviors due to body image dissatisfaction⁽¹⁴⁾, leading to poor nutritional status, low self-esteem, stunted psychosocial development, clinical depression⁽¹⁵⁾ and increased risk of eating

disorders compared to that of adolescents who are pleased with their body image⁽¹⁶⁾.

The fact that distorted perceptions of body weight have adverse consequences on health and nutritional status and the paucity of available knowledge on this issue in municipalities in inland Brazil justify the present study, which seeks to investigate body satisfaction among secondary students attending public schools in Caruaru, state of Pernambuco, Brazil, and assess potential associations between body image dissatisfaction, nutritional status, socio-demographic factors, lifestyle, and perceived health status.

Method

This cross-sectional study was performed on a sample of 15- to 20-year-old students enrolled in the state-operated public school system of Caruaru, state of Pernambuco, Brazil.

The municipality of Caruaru is located in the arid area of the state of Pernambuco, in Northeast Brazil, 120 km from the state capital, Recife. Caruaru is considered the “capital” of the arid area of Pernambuco, and, according to State Department of Education and Culture (Secretaria da Educação e Cultura, SEDUC) data, was home to 8,833 secondary students distributed among 15 public schools as of 2007.

Sample size was calculated in SampleXS, a sample calculator for cross-sectional studies made available by the World Health Organization (WHO). The following parameters were used: population, 8,833; confidence interval, 95%; maximum error, $\pm 5\%$; design effect, 1.5; and, as the precise extent of high-risk health-related behaviors in secondary students in the municipality of Caruaru is unknown, an estimated prevalence of 50%.

Using these parameters, the sample size was calculated as 541 subjects. In anticipation of refusal to participate, the estimated size was multiplied by 1.2, yielding a final sample of 649 subjects. During the sample selection process, the proportion of students according to geographic region (within the municipality of Caruaru), school size, and period (day vs. night school) were taken into account. Students taking morning and afternoon classes were grouped into a single category (daytime students).

A random, two-stage cluster sampling strategy was chosen. The first stage was conducted at the school level; all state-operated secondary schools in Caruaru were deemed eligible for participation. School and student density in each microregion of the municipality and school size (small, medium, large) were used as stratification criteria. School size was determined on the basis of student population: those serving more than

500 enrolled students were considered large; from 200 to 499 students, medium; and fewer than 200 students, small.

For the second stage of sampling, all classes (lowest sampling unit) of the selected schools were considered eligible for inclusion. The density of classes in each school and number of students enrolled in daytime and night classes were used as stratification criteria. The Research Randomizer online application (available at <http://www.randomizer.org>) was used to generate random numbers for sampling. According to 2007 school census data, each secondary education class had 41 enrolled students on average. Therefore, 16 classes from eight secondary schools (58.6% of all schools in the municipality) were randomly selected. As the Department of Education could not provide a named list of students for random selection, the class was defined as the smallest sample unit; all students attending class on the day of data collection for their respective age range were thus invited to take part in the study. Students with physical or mental disabilities were excluded from the sample.

The *Comportamentos de Risco em Adolescentes Catarinenses* (COMCAP) questionnaire, which has already been validated in a sample of Brazilian public school students⁽¹⁷⁾, was chosen as the data collection instrument. A pilot study conducted on a sample of Caruaru students in the same age range showed moderate-to-high reproducibility.

The dependent variable was body image satisfaction, an indirect measure of perceived body weight, with the following closed-ended response alternatives: “yes, I am [satisfied]”; “no, I would like to gain [weight]” (dissatisfaction due to perceived underweight), and “no, I would like to lose [weight]” (dissatisfaction due to perceived overweight). The independent variables comprised measures of nutritional status (Body Mass Index), socio-demographic and economic characteristics (gender, age, marital status, monthly household income, year of secondary education, and attendance of daytime or night classes), lifestyle habits (physical activity, sedentary behavior, fruit and vegetable intake, number of daily meals, smoking, and alcohol consumption), and health perception (overall health, sleep patterns, and stress).

BMI (body mass (kg)/(height (m))²) was used as a marker of nutritional status. Cutoffs for underweight, adequate weight, overweight, and obesity were as proposed by Conde *et al.*⁽¹⁸⁾. Body weight and height were measured according to standards proposed in the scientific literature⁽¹⁹⁾. Height measurements were obtained with a portable stadiometer (SECA® 206, SECA, São Paulo, Brazil; measurement range: 120–220cm) to 0.5cm precision, and weight was measured with a previously calibrated

digital platform scale (Plenna[®] Sport, São Paulo, Brazil; measurement range: 30–150kg).

The frequency, intensity, and duration of physical activity in four settings (at leisure, at home, for transportation, and at work) were investigated. Subjects were considered insufficiently active when they reported engagement in less than 60 minutes of moderate-to-vigorous physical activity per day, 5 or more days a week, and physically active when they engaged in moderate-to-vigorous physical activity for 60 or more minutes per day, 5 or more days per week. Daily television watching time was used as a surrogate marker of sedentary behavior. Students were divided into two groups: those who watched 3 hours of TV a day or less and those who watched more than 3 hours of TV a day.

Fruit and vegetable intake was considered adequate when subjects reported eating five or more daily servings. The number of daily meals was classified as fewer than three or three or more meals per day.

Students were asked to describe their perception of the stress level of their lives. Subjects who reported feeling “nearly always or excessively stressed” were classified as having a negative perception of their stress level, and those who claimed to feel stressed “rarely or occasionally” as having a positive perception.

Concerning sleep quality, students were asked how often they experience a good night’s sleep. The closed-ended response alternatives were “always,” “nearly always,” “occasionally,” or “never”. Responses were then classified into positive or negative perception categories (subjects who chose “always”/“nearly always” or “occasionally”/“never”, respectively). Students who reported perceiving their overall health status as “excellent” and “good” were classified as having a positive perception, and those who perceived it as “fair” or “poor,” as negative.

Data were tabulated in the EpiData 3.1 software environment. A double data entry method was used to detect any errors in entry. The “Validate” function of EpiData was used to generate a file containing information on data entry errors, enabling correction and guiding the database review and cleanup process. Verified data were then exported into the SPSS 15.0 software package for statistical analysis.

For descriptive analysis, categorical variables were expressed as frequency distributions and continuous variables, as means and standard deviations. The chi-square test was used to test for association between variables, with the chi-square test for trend used for variables on an ordinal scale. The association of each of the response categories of the dependent variable was assessed during this stage of analysis, with p-values calculated in Epi-Info 6.04d.

Binary logistic regression was the approach chosen for multivariate analysis, with “dissatisfaction due to perceived underweight” and “dissatisfaction due to perceived overweight” as the outcomes of interest. After crude analysis, a hierarchical model that had been previously constructed as recommended in the literature^(20,21) was employed to establish the order of entry of independent variables into the regression equation.

The hierarchical approach adopted took three levels into account: distal, which included demographic and economic variables (gender, age range, marital status, monthly household income, day vs. night school); intermediate, which included perceived health status, sleep quality, physical activity, and fruit and vegetable intake; and proximal, which consisted of nutritional status and number of daily meals. The model was composed of analyses adjusted for each level and for the level preceding it. Adjusted regressions were also conducted on the two negative outcomes of interest, stratified by gender and nutritional status [underweight and excess weight (overweight + obesity)]. The significance level was set at $p < 0.05$ for all inferential statistics.

The study was approved by the Associação Caruaruense de Ensino Superior (ASCES) Human Research Ethics Committee, in accordance with Brazilian National Health Council Resolution 196, which defines ethical standards for human subject research. Students who agreed to take part in the project were provided with information about the study and provided written informed consent. Furthermore, the present study was conducted with the approval of the Pernambuco State Department of Education, which provided school census data to support study design and analysis.

Results

A total of 16 classes in eight schools were visited, as noted in the Methods section. Of the 624 students in attendance during the collection period, 24 (3.8%) refused to take part in the study, leaving a population of 600 potential subjects. Six questionnaires were later excluded due to missing information on body image satisfaction. The final sample thus comprised 594 students (62.0% females) with a mean age of 17.5 ± 1.6 years.

Most students were single, attended night school, and had a monthly household income of two minimum wages or less. Socio-demographic and educational data are shown in Table 1.

Overall, 38.7% of subjects (95%CI, 34.8–42.7) reported satisfaction with their current weight, whereas 31.3% (95%CI, 27.6–35.2) wished to gain and 30.0% (95%CI, 26.3–33.8)

wanted to lose weight. No association was detected between body weight satisfaction and age. All other variables were significantly associated with the desire to lose weight, as shown in Table 2. In general, students who were pleased with their weight ate at least five daily servings of fruit and vegetables, had a positive perception of sleep quality, and had three or more proper meals per day ($p < 0.05$) (Table 2). Male subjects, those attending night classes, and those underweight were more likely to report a desire for weight gain (Table 2).

After adjusting for the possible confounders gender and nutritional status, female subjects were 54% less likely to report a desire to gain weight, whereas subjects with overweight and obesity were 87% and 97% less likely to report a desire to gain weight, as shown in Table 3. Female subjects, those with a higher household income, those who had fewer than three meals a day, and those actually overweight were all more likely to desire weight loss (Table 4).

Most underweight male subjects wished to gain weight—a significantly higher rate than that found among female subjects ($p < 0.05$). Indeed, 13.5% of all male subjects reported a desire to gain body mass, even those who were

overweight. Among students who wanted to lose weight, the proportion of overweight females was significantly higher than that of males. Overall, 18.8% of female subjects wished to lose weight, including some who were already underweight (Figure 1).

Discussion

The chosen sampling procedure suggests that the sample size was representative of the number of schools in the municipality of Caruaru and of the students enrolled therein, which enables extrapolation of study results to the entire secondary student population of the municipality's network of state-operated schools.

One limitation of the study is that its design did not allow population-wide identification of age ranges, as the data provided by the State Department of Education were not stratified by age. Therefore, our results should be viewed cautiously when in comparison to adolescent populations, as 12.3% of students in the sample were 20 years old, and the WHO definition of adolescence is restricted to the ages of

Table 1 - Socio-demographic, economic, and educational distribution of secondary students attending public schools in the municipality of Caruaru, Pernambuco.

Variable	Male		Female		Overall	
	%	n	%	n	%	n
<i>Age</i>						
15	6.2	14	11.5	42	9.5	56
16	19.0	43	22.5	83	21.2	126
17	27.4	62	22.7	84	24.5	146
18	18.1	41	20.3	75	19.5	116
19	14.6	33	11.0	40	12.3	73
20	14.6	33	12.0	44	12.3	77
<i>Marital status</i>						
Single	97.3	219	9.0	348	95.2	567
Married	0.4	1	3.3	11	2.2	12
Other	2.2	5	2.7	10	2.5	15
<i>Monthly household income</i>						
≤ R\$500.00	37.3	85	38.2	140	37.8	225
R\$501.00 – R\$1,000.00	30.0	69	36.5	133	34.0	202
R\$1,001.00 – R\$2,000.00	20.5	46	19.5	72	19.9	118
≥ R\$2,001.00	12.3	27	5.8	22	8.3	49
<i>Year of secondary school</i>						
1	44.1	101	49.1	181	47.3	282
2	31.9	73	31.3	114	31.5	187
3	23.9	53	19.6	72	21.2	125
<i>Classes</i>						
Day	35.3	80	50.3	185	44.7	265
Night	64.7	145	49.7	184	55.3	329

10 to 19. However, as the sample was representative of the reality of secondary students in the municipality, we decided against exclusion of 20-year-old subjects from analysis. Furthermore, the comparison of findings of the present study is closer to adolescence than to adulthood.

The overall prevalence of body image dissatisfaction was high—61.3%, a rate similar to that found by Vilela *et al* (59%)⁽¹⁶⁾ and Graup *et al* (67%)⁽²²⁾ in studies conducted

in Southern Brazil. High body image dissatisfaction rates (63.9%) have also been reported in a sample of preadolescents (aged 8–10 years) from upstate Rio Grande do Sul⁽¹²⁾.

Although body dissatisfaction was detected in both genders, perceptions of body image had different effects on male and female subjects. Most girls wanted to lose weight, whereas boys were more likely to desire weight gain. These results are consistent with those reported in other studies,

Table 2 - Association between body weight satisfaction and associated factors among secondary students attending public schools in the municipality of Caruaru, Pernambuco.

Variable	Satisfied		Not satisfied, would like to gain weight		Not satisfied, would like to lose weight	
	% (n)	<i>p</i>	% (n)	<i>p</i>	% (n)	<i>p</i>
<i>Gender</i>						
Male	40.9 (92)	0.39	42.7 (96)	<0.001	16.4 (37)	<0.001
Female	37.4 (138)		24.4 (90)		38.2 (141)	
<i>Age range</i>						
15 – 17	38.5 (126)	0.91	28.7 (95)	0.17	32.0 (106)	0.16
18 – 20	39.0 (104)		33.8 (91)		26.8 (72)	
<i>Marital status</i>						
Single	39.2 (221)	0.13	31.9 (180)	0.25	28.9 (163)	<0.001
Married/other	25.0 (7)		21.4 (6)		53.6 (15)	
<i>Family income</i>						
≤ R\$500	42.7 (106)	0.08	32.7 (82)	0.45	23.9 (60)	<0.001
≥ R\$501	35.8 (124)		29.8 (104)		33.8 (118)	
<i>Classes</i>						
Day	39.1 (104)	0.86	21.9 (59)	<0.001	38.3 (103)	<0.001
Night	38.4 (126)		38.4 (127)		22.7 (78)	
<i>Physical activity</i>						
Active	40.5 (139)	0.37	32.9 (114)	0.37	26.0 (90)	0.02
Insufficiently active	36.9 (90)		27.9 (69)		34.4 (88)	
<i>Fruit & vegetable intake</i>						
< 5 servings/day	33.9 (133)	0.01	31.6 (124)	0.95	34.4 (135)	<0.001
≥ 5 servings/day	48.2 (96)		31.2 (62)		20.6 (41)	
<i>Perception of health status</i>						
Positive	40.3 (184)	0.15	31.7 (146)	0.51	27.8 (127)	0.03
Negative	33.6 (46)		28.8 (40)		37.2 (51)	
<i>Perception of stress status</i>						
Positive	41.6 (197)	0.11	31.5 (149)	0.75	26.7 (127)	<0.001
Negative	27.3 (33)		30.6 (37)		41.1 (51)	
<i>Perception of sleep quality</i>						
Positive	42.6 (194)	<0.001	29.6 (136)	0.19	27.2 (125)	0.01
Negative	25.9 (36)		35.5 (50)		37.6 (53)	
<i>Three meals/day</i>						
Yes	42.9 (176)	0.02	32.5 (134)	0.23	24.3 (100)	<0.001
No	29.3 (54)		27.7 (52)		41.5 (78)	
<i>Nutritional status</i>						
Adequate weight	44.1 (179)	<0.001	35.7 (147)	0.00	19.4 (80)	<0.001
Underweight	32.3 (10)		54.8 (17)		12.9 (4)	
Overweight	29.0 (31)		15.0 (16)		56.1 (60)	
Obese	9.1 (3)		6.1 (2)		84.8 (28)	

which show that, regardless of nutritional status, women generally seek a slimmer figure⁽²³⁾ whereas men want stronger bodies^(16,22). According to Kostanski *et al*, the issue of body image dissatisfaction affects both genders, but not in the same manner; therefore, prevention and mitigation strategies should target each gender independently⁽²⁴⁾.

It bears noting that, in the present sample, girls were 2.93 times more likely than boys to want to lose weight. Other studies have shown that body image dissatisfaction due to perceived overweight primarily affects women^(3,16,22). Our culture, which disseminates the notion that leanness in women is synonymous with competence, success, and sexual attractiveness, is tied to

Table 3 - Crude and adjusted regression (hierarchical model) between desire to gain weight and associated factors among secondary students attending public schools in the municipality of Caruaru, Pernambuco.

Variable	Not satisfied, would like to gain weight			
	Crude PR (95%CI)	p	Adjusted PR (95%CI)	p
<i>Gender</i>				
Male	1.00		1.00	
Female	0.42 (0.30-61)	0.00	0.43 (0.28-0.71)	<0.001
<i>Age range</i>				
15-17	1.00		1.00	
18-20	1.27 (0.90-1.74)	0.17	1.12 (0.71-1.73)	0.49
<i>Marital status</i>				
Level 1 Single	1.00		1.00	
Other	0.59 (0.23-1.48)	0.25	0.78 (0.27-2.19)	0.62
<i>Family income</i>				
≤R\$500	1.00		1.00	
≥R\$501	0.87 (0.61-1.24)	0.45	0.77 (0.51-1.18)	0.23
<i>Classes</i>				
Day	1.00		1.00	
Night	2.21 (1.54-3.18)	0.00	1.54 (0.95-2.46)	0.07

<i>Physical activity</i>				
Active	1.00		1.00	
Insufficiently active	0.78 (0.55-1.12)	0.37	0.89 (0.58-1.36)	0.51
<i>Fruit & vegetable intake</i>				
<5 servings/day	1.00		1.00	
≥5 servings/day	1.01 (0.70-1.46)	0.95	1.08 (0.71-1.50)	0.86
<i>Health status</i>				
Level 2 Positive	1.00		1.00	
Negative	0.87 (0.57-1.32)	0.51	0.81 (0.44-1.34)	0.48
<i>Stress status</i>				
Positive	1.00		1.00	
Negative	0.93 (0.60-1.43)	0.75	1.03 (0.66-1.89)	0.81
<i>Sleep quality</i>				
Positive	1.00		1.00	
Negative	1.30 (0.87-1.94)	0.19	1.48 (0.93-2.38)	0.09

<i>Three meals/day</i>				
Yes	1.00		1.00	
No	0.79 (0.54-1.16)	0.23	1.10 (0.68-1.66)	0.83
<i>Nutritional status</i>				
Level 3 Adequate weight	1.00		1.00	
Underweight	1.62 (0.55-4.78)	0.87	3.81 (1.01-13.88)	0.05
Overweight	0.18 (0.12-0.24)	0.00	0.13 (0.08-0.22)	<0.001
Obese	0.04 (0.16-0.11)	0.00	0.03 (0.01-0.07)	<0.001

Table 4 - Crude and adjusted regression (hierarchical model) between desire to lose weight and associated factors among secondary students attending public schools in the municipality of Caruaru, Pernambuco.

Variable		Not satisfied, would like to lose weight			
		Crude PR (95%CI)	<i>p</i>	Adjusted PR (95%CI)	<i>p</i>
<i>Gender</i>					
	Male	1.00		1.00	
	Female	3.01 (2.02-4.65)	0.00	2.93 (1.65-5.19)	<0.001
<i>Age range</i>					
	15 – 17	1.00		1.00	
	18 – 20	0.77 (0.54-1.10)	0.16	0.83 (0.49-1.40)	0.49
<i>Marital status</i>					
Level 1	Single	1.00		1.00	
	Married/other	2.88 (1.34-5.18)	0.00	1.94 (0.66-5.64)	0.22
<i>Family income</i>					
	≤R\$500	1.00		1.00	
	≥R\$501	1.62 (1.12-2.34)	0.00	1.70 (1.18-2.66)	<0.001
<i>Classes</i>					
	Day	1.00		1.00	
	Night	0.47 (0.33-0.67)	0.00	0.68 (0.38-1.13)	0.07

<i>Physical activity</i>					
	Active	1.00		1.00	
	Insufficiently active	1.42 (1.04-2.13)	0.02	1.47 (0.90-2.41)	0.12
<i>Fruit & vegetable intake</i>					
	<5 servings/day	1.00		1.00	
	≥5 servings/day	0.50 (0.37-0.74)	0.00	0.97 (0.79-1.21)	0.87
<i>Health status</i>					
Level 2	Positive	1.00		1.00	
	Negative	1.52 (1.02-2.27)	0.03	1.23 (0.74-2.18)	0.49
<i>Stress status</i>					
	Positive	1.00		1.00	
	Negative	1.92 (1.27 – 2.89)	0.00	1.51 (0.92 – 2.71)	0.18
<i>Sleep quality</i>					
	Positive	1.00		1.00	
	Negative	1.60 (1.09-2.39)	0.01	1.33 (0.81-2.31)	0.27

<i>Three meals/day</i>					
	Yes	1.00		1.00	
	No	2.22 (1.53-3.19)	0.00	1.79 (1.32-2.94)	<0.001
<i>Nutritional status</i>					
Level 3	Adequate weight	1.00		1.00	
	Underweight	0.45 (0.21-0.95)	0.03	0.29 (0.11-0.64)	<0.001
	Overweight	3.15 (1.78-5.56)	0.00	3.51 (1.91-6.56)	<0.001
	Obese	8.09 (1.99-16.15)	0.03	8.92 (2.05-18.11)	<0.001

increased rates of this particular profile of body dissatisfaction. On the other hand, young men are guided toward several social functions that require strength and athleticism, which makes them more susceptible to a desire for weight gain⁽²⁵⁾.

Brook and Tepper, in a study of the perceptive component of body image among 14-to-18-year-old adolescents, found that girls were at a fourfold risk of body dissatisfaction due to perceived overweight⁽²⁶⁾. According to Ferrando *et al*, body image distortion in women occurs both at the perceptive level (overestimation of body weight) and at the emotional level⁽²⁷⁾.

Association of body dissatisfaction with nutritional status showed that underweight subjects would like to gain weight, whereas overweight students would like to lose weight. It should be noted that 64.1% of subjects who reported body image dissatisfaction were actually within adequate weight ranges, while 29.9% were overweight. These findings corroborate the results of prior studies that have detected body image dissatisfaction in adolescents and young adults with normal weight: Bosi *et al*, in 2006⁽²⁸⁾, found that 82.9% of female college students with altered self-perception of body image had a normal BMI, and only 11.4% had a BMI consistent with overweight or obesity; Benedikt *et al*, in 1998, found that 60.7% of female adolescents in their study sample were unhappy with their body weight, although only 13.6% were actually overweight⁽²⁹⁾; and Nunes *et al* (2001), studying a sample of female subjects between the ages of 12 and 29, found that only one-third of those who believed themselves “fat” actually had BMIs consistent with overweight or obesity⁽⁷⁾.

In the present sample, 13.5% of boys wanted to gain body mass despite being overweight (which probably reflects a desire for greater muscle mass), whereas 18.8% of girls wanted to lose weight despite already being underweight (which shows a greater likelihood of abnormal dietary behavior and eating disorders). The current evidence base suggests that ascribing excessive importance to body weight, regardless of nutritional status (BMI), is one of the most significant predictors of abnormal dietary behavior and inadequate weight management practices^(30,31). Grigg *et al*, in a 1996 study of 14-to-16-year-old girls with body image dissatisfaction, found that 57% of subjects (n=853) engaged in unhealthy dietary behavior and 36% self-medicated with anorectics, diuretics, laxatives, and/or extremely restrictive diets.⁽³²⁾ Alves *et al* (2008) found a close relationship between body dissatisfaction and abnormal dietary behaviors indicative of eating disorders⁽¹³⁾.

The present study found an association between meal skipping and body image dissatisfaction; this association

persisted after adjusting for possible confounders. Students who had fewer than three meals a day were 1.79 times more likely to be dissatisfied due to perceived overweight. This finding corroborates the results of Branco *et al* (2007), who found a significant relationship between body image distortion and skipping breakfast in a sample of adolescent females ($p < 0.05$)⁽³³⁾. Branco *et al* suggested that adolescents who are unhappy with their body image tend to skip certain meals, such as breakfast, in an attempt to reduce daily calorie intake and lose weight⁽³³⁾.

On crude analysis, significant associations were found between body image dissatisfaction due to perceived overweight and the following variables: physical inactivity; daily fruit and vegetable intake of fewer than five servings; and negative perception of overall health status, stress status, and sleep quality. After adjusting for confounders, however, none of these associations persisted. It was to be expected that subjects who wished to lose weight might adopt healthy lifestyle choices, such as physical exercise, balanced diets, adequate sleep patterns, and stress reduction. However, as noted above, adolescents and young adults often engage in inadequate weight management practices, such as skipping meals.

Socioeconomic level has been suggested as a possible determinant of body image dissatisfaction among children and adolescents⁽³⁴⁾. In the present study, secondary students with a higher household income were more likely to be dissatisfied due to perceived overweight. Ogden and Thomas (1999) also found an association between higher social status and increased concern with body image in a sample of girls between the ages of 13 and 16⁽³⁵⁾. On the other hand, Pereira *et al* (2009), in an assessment of 402 schoolchildren between the ages of 9 and 15, found that rates of body image dissatisfaction were highest among those coming from underprivileged backgrounds⁽³⁴⁾, and Wang *et al*, in 2007⁽³⁶⁾, found no significant differences in socioeconomic status between 15-to-18-year-old adolescents with and without body image dissatisfaction. There is no consensus in the literature regarding the relationship between socioeconomic status and body image dissatisfaction, most likely due to the several different ways in which this variable is quantified—sometimes by parental occupation, sometimes using the educational achievement of the head of household as a surrogate, and, in many other studies, by analyzing household income and ownership of durable goods. It bears noting that, currently, overweight is inversely related to socioeconomic status in Brazil; therefore, it is to be expected that body image dissatisfaction will follow a similar pattern.

In short, the present study found high rates of body image dissatisfaction in both genders. Male subjects and those with underweight were most likely to wish to gain weight, whereas females, subjects who had fewer than three meals a day, those from higher-income backgrounds, and overweight or obese ones were more likely to want to lose weight. Perception of body weight was distorted in both genders; 13.5% of overweight

boys were nevertheless interested in gaining weight, whereas 18.8% of underweight girls still wanted to be thinner.

The present study highlights the need for preventive measures that provide a clear view of body image issues in our culture and the risk of adverse health outcomes, and further demonstrates that such preventive strategies should target each gender independently.

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