

Body weight dissatisfaction and its correlates among Brazilian adolescents

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OBJECTIVE: This study examined the prevalence of body weight dissatisfaction and its relationship to physical activity and nutritional status in adolescents.

METHOD: The study enrolled 2,288 adolescents. The dependent variable was body weight dissatisfaction. The independent variables were physical activity and nutritional status. The confounders were gender, and economic condition. Associations between dependent and independent variables were analyzed through the chi-square test and the magnitude of the associations was estimated by Poisson regression.

RESULTS: A total of 56.6% of adolescents were not satisfied with their weight, with 17.9% wanting to increase it, while 37.7% wanted to decrease their weight. In boys and girls, body weight dissatisfaction was associated with nutritional status, abdominal obesity and physical activity in crude analyses. After adjustments, nutritional status and abdominal obesity remained significantly associated to body weight dissatisfaction in both sexes.

CONCLUSION: A high prevalence of body weight dissatisfaction was identified, which was associated with the nutritional status and abdominal obesity in adolescents.

KEYWORDS: dissatisfaction; body weight; adolescents; obesity; physical activity.

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INTRODUCTION

In the last decades, epidemiological data have evidenced a decrease in the prevalence of individuals classified as underweight and an increase in overweight individuals.¹ Currently, overweight individuals and obesity have been reported in the literature as major public health concerns, observed not only in adults,² but also in pediatric populations,³⁻⁵ since it has been related to cardiovascular and psychological disorders.^{6,7}

Obesity has been associated with a high prevalence of dissatisfaction with body weight,⁸ determined by whether the individual was not satisfied with their body weight. In Iceland, it was observed that 50% of women and 35% of men were dissatisfied with their body weight, with most wanting to reduce their weight.⁹ High prevalence of dissatisfaction with body weight was also observed in adolescents from 24 countries in Europe, Canada and the United States.¹⁰

The practice of physical activity has been associated with psychological benefits (optimism, satisfaction with life, and decreased depressive symptoms)^{11,12} in youths. However, the association between physical activity and body weight dissatisfaction is less clear. While one study did not find a significant association (considering all physical activities at least 60 min per day, five days per week),¹³ another study identified significant association between physical activity levels and body weight dissatisfaction.¹⁴ Part of this controversy may be related to the types of physical activities assessed. In fact, Reel et al.¹⁴ in a meta-analysis showed that in adults the types of exercise can influence the perception that the individual has of his body. According to these authors, pairing anaerobic exercises with weight training has greater effects when compared to only aerobic exercise.

However in adolescents little is known about the effect of different types of physical activities (e.g. leisure or sports) upon dissatisfaction with body weight. Therefore, the purpose of this study was to evaluate the prevalence of body weight dissatisfaction and its relationship with nutritional status and different types of physical activity in adolescents.

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■ METHODS

Sample

Londrina is the third largest city of southern Brazil (approximately 500,000 inhabitants) and has a high human development index (HDI) = 0.84. Approximately 97,000 school children and adolescents are enrolled in elementary and high school. In this epidemiological study, the minimum sample size of 1,534 subjects was estimated considering a prevalence of body dissatisfaction of 45.6%,¹⁵ error of 3%, 95% confidence interval ($z = 1.96$) and design effect of 1.5 (design effect was considered because the classes, instead of students, were taken as a unit of measurement). The schools selected were part of two epidemiological studies in the schools of Londrina, one conducted in 2007 and the other conducted in 2011.

In the first study 10 schools were randomly selected according to the five regions of the city (north, south, east, west and central regions). In the second study, the 6 schools in the central region that most received students from different areas of the city were selected. Thus, data collection included 16 schools. A total of 2,288 individuals agreed to participate and were granted parental permission to take part in the study. The study protocol had been previously approved by the Ethical Research Committee of the State University of Londrina and all parents/adolescents signed written consent forms.

Data collection

Adolescents answered the questionnaire in the classroom. Researchers informed the participants of the study objectives, and remained in the classes while students were filling out the questionnaires, in order to clarify doubts.

The questionnaire included demographic and economic information. For the definition of economic class, the "Economic Classification Criteria of Brazil" in the year 2011 was employed (Brazilian Association of Research Companies – ABEP).¹⁶

These criteria consider the presence of material goods and maids at home and the education level of the household head. Based on scores obtained from the sum of the scores assigned to items, the analyzed adolescents were grouped into the following economic classes A1, A2, B1, B2, C1, C2, D and E. For analysis, they were grouped into a high economic class (A1, A2, B1, B2) and low socioeconomic class (C1, C2, D and E).

Body weight dissatisfaction

Body weight dissatisfaction was assessed via two questions: 1) "Are you satisfied with your current weight?" If not: 2) "Would you like to increase or decrease your current body weight?" For statistical analysis, answers were categorized as "0" if the answer was "I am satisfied with my body weight" and as "1" if it was "I am not satisfied, I would like either to increase or decrease my body weight". The reproducibility of this question was tested in a subsample and showed good reproducibility (Kappa = 0.84).

Physical activity

Physical activity (PA) was assessed using the questionnaire developed by Baecke et al.¹⁷ In a validation study, the physical activity score provided by the questionnaire was significantly related to energy expenditure provided by the doubly labeled water method: $r = 0.69$ and $P = 0.001$.¹⁸

Baecke's questionnaire evaluates PA through three different domains: school activities, sports, and leisure time activities. Through a Likert scale, the Baecke's questionnaire assesses the frequency of different types of physical activity ranging from never through sometimes to very often. The questionnaire also considers the practice of sports by the number of hours per week and the number of months per year engaged in sports. At the end of the questionnaire, a score is provided for each of the three domains of physical activity and adding the scores of the three domains renders a score for the total physical activity of the subject. In this study, the leisure physical activity and sports practice score was taken into account and the adolescents were stratified into quartiles according to their scores. Adolescents were considered physically active if they had been classified in the highest quartile (Q4) and sedentary if classified in the lower quartiles (Q1, Q2 and Q3).

Nutritional status

Overweight status was identified through body mass index values [BMI in kg/m^2]. Body weight was measured by a digital scale (with a maximum capacity of 150 kg) to the nearest 0.1 kg; height was measured by a wall-mounted stadiometer (with a maximum length of 2 meters) to the nearest 0.1 cm. BMI standardized values adjusted by sex and age as proposed by Cole et al.¹⁹ were used to indicate overweight status. Waist circumference was measured by a metallic tape (to the nearest mm) and the cutoffs adjusted by age and sex proposed by Taylor et al.²⁰ were used to discriminate abdominal obesity.

Statistical analyses

Descriptive statistics for numerical variables were mean \pm standard deviation. Prevalence was presented as a categorical variable. Associations between dependent and independent variables were analyzed through the chi-square test (Yates' correction was applied if necessary) and the magnitude of the associations was estimated by Poisson regression with robust variance. Significance was set at $p < 5\%$.

■ RESULTS

Of the 2,288 adolescents analyzed in our study, 54.85% were female ($n = 1,255$) and 45.15% were male ($n = 1,033$). Their ages ranged from 10 to 17, with a mean value of 14.1. Girls were older than boys ($p = 0.008$). Mean waist circumference in boys was approximately 4 cm higher than in girls. Leisure physical activity was higher in boys than girls (Table 1).

Among the adolescents, 1,017 (44.4%) were satisfied with their weight and 56.6% (1271) were not: 17.9% desired a weight increase, while 37.7% wanted a decrease. Table 2 shows associations between the sexes.

Physical activity at leisure time and sports physical activity were marginally associated with body weight dissatisfaction, and these associations remained marginal even after adjustments for sex, economic condition and BMI.

There were positive associations between body weight dissatisfaction and BMI and abdominal obesity (Table 3). More than 70% of the adolescents classified as overweight also had abdominal obesity, and this variable remained significant even after the adjustment for BMI.

Table 1 - General characteristics of the sample stratified by sex.

Variable	Male (n = 1,033)		Female (n = 1,255)		P
	Mean	SD	Mean	SD	
Age (years)	13.88	2.16	14.11	2.13	0.008
Weight (kg.)	56.54	16.20	51.97	12.34	< 0.001
Stature (cm)	164.67	13.34	158.97	8.79	< 0.001
BMI (kg/m ²)	20.49	3.99	20.39	3.79	0.516
WC (cm)	71.09	10.32	67.52	8.79	< 0.001
Leisure physical activity	3.86	2.14	2.68	1.52	< 0.001
Sports	4.12	2.06	2.83	1.58	< 0.001

SD = Standard deviation; BMI = Body mass index; WC = Waist circumference; leisure PAS = leisure physical activity score.

Table 2 - Association between sex, dependent and independent variables.

Variables	Male (n = 1,033) (%)	Female (n = 1,255) (%)	P
Leisure physical activity			
Active	36.9	15.6	< 0.001
Sedentary	63.1	84.4	
Sports			
Active	35.6	13.9	< 0.001
Sedentary	64.4	86.1	
BMI			
Normal	79.6	83.4	0.021
Overweight	20.4	16.6	
WC			
Normal	82.0	87.8	< 0,001
Abdominal obesity	18.0	12.2	

BMI = Body mass index; WC = Waist circumference; AO = Abdominal obesity; Leisure PAS = leisure physical activity score.

DISCUSSION

The main results of this study were: abdominal obesity was associated with body weight dissatisfaction independently of BMI; physical activity was not associated with body weight dissatisfaction. The prevalence of overweight individuals observed in this study (18.3%) was similar to previous studies conducted in Brazil.^{21,22} However, the prevalence of body dissatisfaction was higher (56.6%) and this corroborates other studies.²³⁻²⁵

The higher prevalence of body weight dissatisfaction in girls than in boys has already been previously described for youths in Brazil²³⁻²⁵ and in other countries.²⁶ It partly

reflects the socio-cultural pattern of the western world society in which women must be thin, while men may have a more robust body.²⁷ Additionally, exposure to fashion magazine-originated advertising campaigns was associated with increased body weight dissatisfaction among girls aged 10-14.²⁸

Independently of sex, overweight status was highly associated with body weight dissatisfaction, which has been consistently shown in the literature.²⁹⁻³¹ Thus, the association between being overweight and obesity and body weight dissatisfaction occurs from an early age; thus preventive actions targeting the psychological disorders related to obesity should be initiated within the pediatric population.³² This study also showed that association between abdominal obesity and body weight dissatisfaction was to be expected, since abdominal obesity and general obesity are highly correlated. Interestingly, abdominal obesity was associated with body weight dissatisfaction independently of general obesity. It suggests that the increased amount of body fat located in the abdominal region has an independent effect over body image. Future studies should investigate this issue.

The novelty of this study was that leisure and sports physical activity were not associated with body weight dissatisfaction. The study of Al Sabbah et al.¹³ including more than 17,000 Palestinians adolescents also observed that dissatisfaction with body weight was not related to physical activity. In the same way, Shriver et al,⁸ in a study of American children, found no association between physical activity and global and appearance-related body esteem. On the other hand, Kruger et al,³³ after evaluating 10,021 men and women found that physically active men had higher body satisfaction than sedentary ones. Similar findings were also observed in women.

These discrepancies may have occurred in the different types of assessment of body satisfaction (different types of questionnaire and silhouette scales) as well the ways of assessing physical activity. One of the possible reasons to be considered would be the fact that boys are much more active when compared to girls³⁴ and this could influence this relationship.

One limitation of this study is its cross-sectional design that prevents the evaluation of causality. Another limitation is that silhouette scale assessment was not performed. It is suggested that future studies should evaluate the dissatisfaction with body weight in different regions of the country, because in the present study only adolescents in a single city in the southern region of Brazil were evaluated.

Table 3 - Association between body weight dissatisfaction and independent variables.

Independent variables	Univariate analysis			Poisson Regression	
	Unsatisfied (%)	Chi-square	PR _{crude} (95%CI)	PR _{adjusted} (95%CI)	
Leisure physical activity	Sedentary	57.3	0.004	1.00	1.00
	Active	50.3		0.97 (0.90 – 1.05)	0.97 (0.94 – 1.00)
Sports	Sedentary	79.9	0.003	1.00	1.00
	Active	49.2		0.95 (0.92-0.98)	0.97 (0.94-1.00)
BMI	Normal	48.7	0.001	1.00	1.00
	Overweight	85.9		1.19 (1.06 – 1.34)	1.19 (1.14 – 1.23)
WC	Normal	50.5	0.001	1.00	1.00
	Abdominal obesity	84.9		1.08 (1.05 – 1.22)	1.09 (1.01 – 1.16)

PR = Prevalence ratio; 95%IC = 95% confidence interval; BMI = Body mass index; WC = Waist circumference.

However strengths should also be highlighted. The study was conducted within a school population in one of the largest cities in southern Brazil and the BMI measurement was obtained directly.

CONCLUSION

In summary, we detected a high prevalence of dissatisfaction, which is affected by general and abdominal obesity. Physical activity (leisure time and sports) was not associated with body weight dissatisfaction.

DECLARATION OF INTEREST

The authors report no conflict of interest.

INSATISFAÇÃO COM PESO CORPORAL E CORRELATOS ENTRE ADOLESCENTES BRASILEIROS

RESUMO

OBJETIVOS: Esse estudo teve como objetivo analisar a prevalência de insatisfação com o peso corporal e sua relação com atividade física e estado nutricional em adolescentes.

MÉTODO: O estudo envolveu 2.288 adolescentes. A variável dependente foi a insatisfação com o peso corporal. As variáveis independentes foram a atividade física e estado nutricional. Os fatores de confusão foram: sexo e condição econômica. As associações entre as variáveis dependentes e independentes foram analisadas por meio do teste do qui-quadrado e a magnitude das associações foi estimada pela regressão de Poisson.

RESULTADOS: Um total de 56,6% dos adolescentes não se declararam satisfeitos com seu peso, 17,9% queriam aumentar, enquanto que 37,7% queriam diminuir o seu peso. Entre meninos e meninas, a insatisfação com o peso corporal associou-se com o estado nutricional, obesidade abdominal e atividade física em análises primárias. Após os ajustes, o estado nutricional e a obesidade abdominal permaneceram significativamente associados à insatisfação com o peso corporal em ambos os sexos.

CONCLUSÕES: Uma elevada prevalência de insatisfação com o peso corporal foi identificada e associada com o estado nutricional e com obesidade abdominal em adolescentes.

UNITERMOS: insatisfação com o peso corporal; adolescentes; obesidade, atividade física.

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