



PREVALENCE OF BODY SHAPE CONCERNS AND ASSOCIATED FACTORS AMONG BRAZILIAN EARLY ADOLESCENTS

doi: 10.2478/humo-2013-0047

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ABSTRACT

Purpose. The objective of this study was to evaluate the prevalence of body shape concerns and associated factors among Brazilian early adolescents. **Methods.** This was a school-based cross-sectional epidemiological study conducted with 526 girls between 11 and 14 years enrolled in thirteen public schools in Florianópolis, Santa Catarina, Brazil. The Body Shape Questionnaire and Eating Attitude Test (EAT-26) was administered. Sociodemographic variables (age group, household head education, and socioeconomic status), sexual maturation (pubic hair growth, breast development, and menarche) and percentage of body fat (%BF) were collected. Analyses were conducted using Poisson regression and a confidence level of 95%. **Results.** The prevalence of body shape concerns was 24.1% (95% confidence interval – CI: 17.5–30.7). Adolescent girls aged 13–14 years (prevalence ratio – PR = 1.07, 95% CI: 1.03–1.11; $p = 0.02$), with very high (PR = 1.52, 95% CI: 1.21–1.90; $p = 0.004$) and high %BF (PR = 1.25, 95% CI: 1.18–1.32; $p = 0.004$), and those girls showing risk behaviors for anorexia and bulimia (PR = 1.37, 95% CI: 1.19–1.59; $p = 0.01$) were more concerned with their body image. **Conclusions.** The prevalence of body shape concerns among Brazilian girls was considerable and was associated with age, %BF, and risk behaviors for anorexia and bulimia. This study highlights the importance of screening for body image concerns in schools, preventing the adoption of unhealthy body weight ideals, and the development of excessive body shape concerns in this population.

Key words: body image, anorexia nervosa, bulimia nervosa, adiposity, adolescent, puberty

Introduction

In adolescence, body image is a central aspect of psychological and interpersonal development [1] due to physical changes that occur at this stage and that generate the need for adaptation. The body shape concerns of adolescent girls are mainly the result of sociocultural pressures to achieve the thin ideal, perpetuated mainly in countries of Western culture [2]. The physical changes that occur as a result of pubertal development promote a distancing from adolescents' ideal body image, creating an environment of intense dissatisfaction [3].

The interest in investigating body image concerns in adolescents has been increasing in recent years because of its influence on other aspects of life such as eating behavior, self-esteem, and psychosocial, physical and cognitive performance [4]. In this respect, body shape concerns have been identified in longitudinal studies as the most important risk factor for the development of eating disorders such as anorexia and bulimia in adolescence [5, 6].

Research conducted with adolescent females in Pakistan [7], Spain [2] and Jordan [8] reported prevalences of body dissatisfaction ranging from 11.4% to 21%. In Brazil, we identified prevalences ranging from 18.5%

to 25.3% in female adolescents from São Paulo/SP [9], Florianópolis/SC [10] and Santa Maria/RS [11]. The study conducted in Florianópolis /SC [10] showed that the chance of showing symptoms of eating disorders was higher amid 10- to 13-year olds, stressing the importance of investigating the problem of body shape concerns already at early adolescence.

Associations between body image and sociodemographic factors such as age, socioeconomic status, and parental education are complex and studies show inconclusive findings [8, 12–14]. There is also no consensus on the relationship of this outcome with biological variables such as fat percentage [11, 15, 16] and sexual maturation [3, 8, 17]. In regards to risk factors for eating disorders, studies have shown an association with body dissatisfaction [5, 6]. However, in Brazil, these relationships has been little explored, with the available literature showing contradictory results, finding that there is an association between these variables [10] and that there is no association [11].

In addition, most of the knowledge on this subject comes from studies conducted in other countries, which reinforces the importance of furthering research on these relationships within a Brazilian adolescent population. To fulfill this research gap, the goal of the present study was to analyze the prevalence of body shape concerns and their association with socio-demographic (age group, socioeconomic status, and educational level of the house-

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hold head), biological (body fat and maturation), and behavioral (risk of eating disorders) factors in adolescent girls aged 11 to 14 years from medium-size city in Brazil. It is expected that this information will be useful for identifying higher-risk groups and subsidize actions that promote improvements in adolescents' body image, ultimately helping preventing problems related to body concerns.

Material and methods

The study was conducted using a school-based cross-sectional methodology involving a population of 5231 girls aged between 11 and 14 years, studying in public schools (5th–8th grade) in Florianópolis, Santa Catarina, Brazil. These data were collected by the 2008 School Census and made available by the Department of School Registry and Statistics, State Education Secretary Office of the State of Santa Catarina.

Epi-Info 6.04 (CDC, USA) software was used for the calculation of a proper sample size (*n*) considering a 95% confidence interval and a prevalence of body shape concerns of 18%, with a margin of error of 5 percentage points. On the basis of these parameters a sample of 217 adolescents was estimated. This number was multiplied by 1.8 to correct for design effect. In addition, 20% was added for possible losses and refusals and 10% to control for confounding factors. Consequently, a sample size of 516 students was selected.

Cluster sampling was performed in two stages. First, schools were selected and then classes within each school. In both stages of the sampling process, selection was done by drawing lots. The schools were divided into three clusters according to the tertile distribution of the number of students in each school. Nineteen small schools, ten medium-sized schools and four large schools were thus identified. Considering that the required sample was 516 adolescents, the number of students needed to compose the sample in each cluster was estimated in proportion to the percentage of students that each cluster represents in relation to the population. In total, the study was conducted on thirteen schools, including seven small schools, four medium-sized schools, and two large schools. The number of students per school was estimated by dividing the number of students necessary per school size by the number of schools sampled per school size. The number of classes selected per school

depended on the number of students necessary for each school and on the number of students in each class sampled, since data were collected from clusters of classes. Table 1 shows the sample distribution according to school size.

The Body Shape Questionnaire (BSQ) [18] was used for the evaluation of body shape concerns. The BSQ is a Likert-type self-administered questionnaire. The instrument consists of 34 questions with six response options (never, rarely, sometimes, frequently, very frequently, and always) scored from 1 to 6. The final score ranges from 34 to 204 points, with higher scores indicating greater concern with body image and greater self-depreciation due to physical appearance, especially the feeling of having excess weight. In the present study, the adolescents were classified as either satisfied (score < 111) and dissatisfied (score ≥ 111) as described by Alves et al. [10]. The BSQ has been found to have good reliability and validity [19]. The Portuguese version of this questionnaire, previously validated by Di Pietro and Silveira [20], was used. This version of the scale kept the characteristics of the original scale and showed good internal consistency (Cronbach's alpha = 0.97).

The Eating Attitude Test (EAT-26) was used to evaluate risk behaviors for anorexia and bulimia. The EAT-26 [21] is a self-reported measure consisting of 26 questions rated on a 6-point Likert scale, ranging from 'never' to 'always', and scored from 0 to 3. The responses never, almost never, and occasionally sum 0 points and the responses sometimes, very often, and always score 1, 2 and 3 points, respectively. Question 25 is reverse scored. The final score of the questionnaire ranges from 0 to 78, with higher scores indicating a greater tendency towards eating disorders (anorexia and bulimia). A cut-off score of 21 was adopted in the present study [21]. The EAT-26 score was classified into two categories: 'yes' for the presence of risk behaviors for anorexia and bulimia (score ≥ 21), and 'no' for the absence of risk behaviors (score < 21). The Portuguese version of this questionnaire, previously translated and validated by Bighetti [22] for application to Brazilian adolescent girls, was used in the present study. This version of the scale showed satisfactory results in factorial analysis and good internal consistency (Cronbach's alpha = 0.82) [22].

The decimal age was calculated based on the date of birth of the adolescents and the date of collection and classified into two age group categories to aid analysis:

Table 1. Number and distribution of the sample according to the size of the school

School size	Total number of schools	Total number of students	%	Number of student samples	Number of schools sampled
Small	19	1627	31.10	160	07
Medium	10	1783	34.08	175	04
Large	04	1821	34.81	181	02
TOTAL	33	5231	100.00	516	13

11 to 12 years (corresponding to an age of 11.00 to 12.99 years) and 13 to 14 years (corresponding to an age of 13.00 to 14.99 years).

The questionnaire by the Brazilian Association of Research Companies [23] was applied to identify socioeconomic status and educational level of the household head. The adolescents were classified into the following socioeconomic strata based on the sum of the scores obtained for each response: high (strata A1, A2, and B1), medium (strata B2 and C1), and low (strata C2, D, and E).

The percentage of body fat (%BF) was estimated by measurements of skinfold thickness using the equations by Slaughter et al. [24]. Triceps and subscapular skinfold measurements were made with a skinfold caliper (Cescorf, Brazil) by a trained examiner according to the recommendations outlined by Benedetti et al. [25]. Two nonconsecutive measurements were obtained for each skinfold. If the difference between measurements was greater or equal to 5%, a third measurement was obtained and the mean of the two closest measurements was used for the calculation of %BF. Intra-examiner technical error was found to be 4.37% and 1.9% for the triceps and subscapular skinfolds' measurement, respectively. According to Gore et al. [26], these values are considered acceptable for an experienced anthropometrist. Percent body fat was classified according to the categories proposed by Lohman [27] as follows: low (up to 15.99%), normal (16% to 25.99%), high (26% to 35%), and very high (> 35%).

Sexual maturation was evaluated according to the Tanner physical development scale [28] based on pubic hair development and breast size. This instrument consists of five figures for each secondary sexual characteristic, with each figure corresponding to a maturity stage. For both characteristics, stage 1 corresponds to the infantile (prepubertal) stage, stages 2, 3, and 4 correspond to the maturation process (pubertal), and stage 5 indicates the mature adult stage (post-pubertal). The stages of pubic hair and breast growth were identified by an individual self-assessment in a private room after an orientation briefing provided by the researcher.

Given that in terms of both pubic hair growth and breast development, prepubertal adolescents were found to constitute a very small portion of the sample and therefore excluded from analysis. Thus, the adolescents were classified into three categories: stages II and III (onset of puberty), stage IV (final phase of puberty), and stage V (post-pubertal).

Age of menarche was also estimated for the evaluation of sexual maturation using the status quo and retrospective methods [29]. The status quo method only requires the adolescent to list their chronological age on the day of the investigation and answer 'yes' or 'no' to the following question: "Have you already had your first menstrual period?". The retrospective method was used for menarcheal adolescents, who were asked

about the month and year of menarche. Recalling the month and year of menarche was evaluated using the following options: with certainty (a) and without certainty (b). Adolescents answering option (b) were excluded from the analysis of menarche. Age of menarche was calculated as decimal age using the month and year of menarche and the date of birth of the adolescents. The adolescents were classified into the following categories according to the tertile distribution of menarcheal age: no menarche, early menarche (1st tertile: 8.98 to 11.48 years), normal menarche (2nd tertile: 11.49 to 12.34 years), and late menarche (3rd tertile: 12.36 to 14.42 years).

Data were collected between August and November 2009 during daytime school classes by a team of seven individuals that included professors and students of a physical education course held at the Federal University of Santa Catarina in Brazil. The members of the data collection team were properly trained in the application of the instruments in order to standardize the procedures.

The study protocol was approved by the Ethics Committee on Human Research of the Federal University of Santa Catarina (protocol No. 214/09). Written informed consent for participation in the study was obtained from the students' parents or legal guardians. Confidentiality of the data obtained in this study was assured.

Descriptive statistics, including the distribution of frequencies and measures of central tendency and variability, were used for characterization of the sample. The prevalence of body shape concerns and risk behaviors for anorexia and bulimia were determined based on the distribution of relative frequencies and their respective confidence intervals. Poisson regression analysis, with estimates of the prevalence ratio (PR) and 95% confidence interval (95% CI), was used to identify variables associated with body shape concerns (outcome variable). A hierarchical model was constructed to establish the order of entry of independent variables. The first level of the hierarchical model included socio-demographic variables (age group, educational level of the household head, and socioeconomic status). The biological variables (%BF, stage of pubic hair growth, stage of breast development, and menarche) were included in the second level. The behavioral variable (risk behaviors for anorexia and bulimia) was analyzed in the third level. As a consequence, all variables were controlled by the other variables at the same level and by the variables in the upper levels. Variables presenting a p value ≤ 0.20 were maintained in the model for the control of confounding factors using backward variable selection. Results were considered significant at the level of significance of 5%. Cluster sampling was considered in all analyses. Data were analyzed with Stata 9.0 statistical software package (Stata, USA).

Results

All adolescents who were part of the selected classes according to the class clusters were invited to participate in the study; this resulted in an initial sample of 567 adolescent girls. The response rate was 82.7%. Of those who did not participate (17.3%), 7.4% refused to participate in the study, 7.6% were absent on the day of data collection, and 2.3% lacked parental consent to participate in the study. Of these, 36 were excluded because they were outside the target age and five due to inadequate responses in the BSQ. The final sample consisted of 526 schoolgirls. Although some of these students presented incomplete data regarding other variables, they were not excluded and all available data were used.

The prevalence of body shape concerns was 24.1% (95% CI: 17.5–30.7). Similarly, the prevalence of risk behaviors for anorexia and bulimia was also considerable, amounting to 26.0% (95% CI: 23.6–28.3).

Table 2. Distribution of adolescent girls according to educational level of the household head, socioeconomic status, body fat percentage, and sexual maturation ($n = 526$)

Variable	<i>n</i>	%
Educational level of household head		
Completed up to elementary school	277	52.9
Completed high school/ incomplete higher education	163	31.2
Completed higher education	83	15.9
Socioeconomic status		
Low	46	8.8
Medium	339	64.8
High	138	26.4
Body fat percentage		
Low	30	6.0
Normal	253	50.4
High	137	27.3
Very high	82	16.3
Stage of pubic hair growth		
Stage 1	22	4.2
Stage 2	66	12.8
Stage 3	128	24.9
Stage 4	243	47.2
Stage 5	56	10.9
Stage of breast development		
Stage 1	4	0.8
Stage 2	39	7.6
Stage 3	142	27.6
Stage 4	234	45.5
Stage 5	95	18.5
Menarche		
Yes	356	67.4
No	172	32.6

Table 2 summarizes the distribution of adolescent girls according to educational level of the household head, socioeconomic status, body fat percentage, and sexual maturation.

Regarding the correlates of body dissatisfaction, results showed that age group ($p = 0.02$), %BF ($p = 0.004$), and presenting risk behaviors for anorexia and bulimia ($p = 0.01$) were associated with the outcome variable. Adolescent girls aged 13–14 years were more concerned with their body image than 11- to 12-year-old girls (PR = 1.07, 95% CI: 1.03–1.11). Adolescent girls with very high (PR = 1.52, 95% CI: 1.21–1.90) and high (PR = 1.25, 95% CI: 1.18–1.32) %BF presented greater preoccupation with their appearance than girls with low %BF. The prevalence of body shape concern was higher among adolescent girls who presented risk behaviors for developing anorexia and bulimia (PR = 1.37, 95% CI: 1.19–1.59). The educational level of household head, socioeconomic status, and indicators of sexual maturation were not associated with body image concerns after multivariate regression analysis (Tab. 3).

Discussion

The present study examined the prevalence of body shape concerns in relation to age group, parents' educational level, socioeconomic status, body fat, indicators of sexual maturation, and risk behaviors for anorexia and bulimia among adolescent girls. To our knowledge, this is the first study to report the correlates of body dissatisfaction in a Brazilian adolescent sample. Results showed that the prevalence of body dissatisfaction and risk behaviors for anorexia and bulimia were considerable (24–26%). Furthermore, our results indicated that being older (13–14 years old), having a higher amount of body fat, and presenting risk behaviors for eating disturbance were significantly associated with higher body shape concerns.

Similar results were observed when comparing the prevalence of body image concerns (24.1%) found in this Brazilian study with those from studies that also used the BSQ in other countries. Adolescents living in Spain (13 to 17 years of age) were found with a prevalence of body-related concerns to be 23.6% [2]. Another study conducted on Jordan adolescents (10–16 years old) reported a prevalence of 21.2%, adopting a cut-off of 110 in BSQ [8]. However, the prevalence of body image concerns was lower among Spanish Caucasian adolescents aged 13 to 17 years (14.2%) [2], suggesting potential intercultural differences.

Most studies with Brazilian teenagers that used the same questionnaire for assessing body image detected lower prevalences of body image concerns in comparison with this study. For instance, Alves et al. [10] reported a prevalence of 18.8% among adolescents (10 to 19 years) from Florianópolis, Santa Catarina, Brazil. In a study conducted in four small towns in Minas Ge-

Table 3. Prevalence ratios (PR) of body shape concerns (BSQ-34) obtained by crude and adjusted (hierarchical model) analyses for the adolescent girls

Variable	Crude analysis		Adjusted analysis	
	PR (95% CI)	<i>p</i>	PR (95% CI)	<i>p</i>
1st Level (sociodemographic variables)				
Age group		0.05		0.02
11–12 years	1.00		1.00	
13–14 years	1.06 (1.00–1.12)		1.07 (1.03–1.11)	
Household head education		0.10		0.07
Up to complete elementary School	1.00		1.00	
Complete high school/ incomplete higher education	1.03 (1.00–1.06)		1.03 (0.99–1.08)	
Complete higher education	1.06 (0.94–1.20)		1.07 (0.95–1.19)	
Socioeconomic status		0.62		0.85
Low	1.00		1.00	
Medium	0.99 (0.80–1.22)		0.98 (0.80–1.20)	
High	1.01 (0.80–1.28)		0.98 (0.76–1.28)	
2nd Level (biological variables)				
Body fat percentage		0.003		0.004
Low	1.00		1.00	
Normal	1.09 (0.97–1.22)		1.08 (0.95–1.22)	
High	1.27 (1.19–1.35)		1.25 (1.18–1.32)	
Very high	1.53 (1.22–1.92)		1.52 (1.21–1.90)	
Pubic hair growth		0.90		0.84
Stages 2 and 3	1.00		1.00	
Stage 4	1.03 (0.86–1.24)		0.98 (0.93–1.04)	
Stage 5	0.99 (0.70–1.39)		1.00 (0.68–1.44)	
Breast development		0.13		0.69
Stages 2 and 3	1.00		1.00	
Stage 4	0.98 (0.95–1.02)		0.97 (0.86–1.08)	
Stage 5	1.10 (0.96–1.26)		1.04 (0.83–1.31)	
Menarche		0.88		0.42
No menarche	1.00		1.00	
Early menarche	1.10 (0.96–1.25)		1.00 (0.93–1.07)	
Normal menarche	1.01 (0.83–1.24)		0.98 (0.81–1.19)	
Late menarche	1.01 (0.83–1.23)		0.94 (0.75–1.18)	
3rd Level (behavioral variables)				
Risk behavior for anorexia and bulimia (EAT-26)		0.005		0.01
No	1.00		1.00	
Yes	1.44 (1.29–1.60)		1.37 (1.19–1.59)	

Values in bold show statistical significance

rais, Brazil, Miranda et al. [14] reported that 11.5% of adolescents (15–19 years of age) were over-preoccupied with their body image. In the town of Santa Maria, Rio Grande do Sul, Brazil [11], the prevalence of body shape concerns (25.3%) in adolescents aged 11 to 13 years was similar to the one found in the present study. Thus, it seems that the lowest prevalences are more typical in studies that examined a larger age interval, which may explain the disparity in the results. It is possible that concerns with body image decrease throughout the adolescence stage after 14 years of age.

Moreover, it appears that the pressure to achieve the feminine beauty ideal affects adolescents from different countries, not only in Brazil. According to the sociocultural model, adolescent girls receive consistent messages from their social environment (e.g., parents, friends, and the media) affirming that a slim physique is attractive and desirable [30, 31]. In this sense, it is believed that the prevalence of body image concerns found in this study may also be related to the environment in which these teenagers live, as Florianópolis is a coastal city with various beaches and exposure of the

body is therefore very frequent. Thus, it is possible that the adolescents in the present study feel more pressured to achieve these demanding social ideals due to the higher exposure of the body. This hypothesis should be explored in future research.

With respect to risk behaviors for anorexia and bulimia, most studies with adolescents have reported lower prevalence than that found in the present study (26%), with rates ranging from 7.1% to 17.9% [10, 32–34]. However, the present results were similar to those reported in Caucasian students from São Paulo [35] and adolescents from Santa Maria, Rio Grande do Sul [11], which found prevalence rates of 26.7% and 27.6%, respectively. In Jordan, a study conducted with adolescents girls aged between 10 and 16 years showed that 40.5% presented risk factors for disordered eating behaviors [8].

It should be emphasized that the EAT-26 is unable to diagnose the presence of eating disorders and only identifies individuals who are at risk of developing these disorders. In this respect, the results obtained for Brazilian adolescents and adolescents from other countries are a matter of concern since symptoms of anorexia and bulimia can progress to clinical cases. This fact highlights the importance of implementing preventive measures in schools that are able to increase the awareness of the damage to health caused by inadequate weight loss practices while promoting adherence to healthy behaviors such as adequate eating and regular physical activity.

Adolescent girls presenting risk behaviors for anorexia and bulimia were more concerned with their body image than those with healthy eating behaviors. This association has also been demonstrated in other cross-sectional [8, 10] and in longitudinal studies [5, 6], confirming the role of body shape concerns as a predictor of abnormal eating behaviors. In this respect, it is presumed that the drive to reach certain social standards of thinness and beauty can lead to the adoption of inadequate eating habits which, if maintained, could progress to clinical cases of eating disorders with serious health consequences [36]. Therefore, eating disorder prevention programs would primarily need to address body image concerns, for example by promoting discussions and reflections about the current cultural pressure to achieve ultra-slender body shapes and weights in order to increase body satisfaction and reduce body-related concerns among adolescents.

With respect to socio-demographic factors, the socioeconomic status and educational level of parents were not associated with body image concerns. These results are consistent with other studies [3, 8, 37], but contradict those reported by McArthur et al. [38] and by Dumith et al. [12], which showed a higher prevalence of body image concerns among adolescents of higher

socioeconomic status. Overall, these variables do not seem to influence body image, indicating that the magnitude of the influence of the media, family, and friends on the ideal standards of beauty does not differ between adolescents from different socioeconomic classes or living in households with adults of different educational levels.

The probability of having body image concerns at the age of 13–14 years was found to increase by 7% when compared to the 11–12 year-old age group. These findings concur with international studies showing that preoccupation with body image increases with age in female adolescents [8, 13]. However, this association was not found in other studies that analyzed larger age intervals [2, 3, 16]. This could mean that body image concerns within adolescents might start decreasing by the age of 14.

As expected, the level of body adiposity also showed an association with the primary outcome variable, with adolescent girls with high and very high %BF being more concerned with their body image than those with low %BF. These findings contradict others observed in adolescents from the town of Santa Maria/RS [11] and the town of Januária/MG [15], where no significant associations between adiposity and body image concerns were found. Nevertheless, this finding is in line with the results of Petroski et al. [16] and Corseuil et al. [39], suggesting that excessive body fat is undesired by adolescent girls, likely because it does not meet the current aesthetic standard which is essentially characterized by thin body shapes.

Sexual maturation was not associated with body image concerns in the present sample. Very few studies are available investigating the association between body image and sexual maturation, determined by the stage of secondary sexual characteristics, which limits comparative analyses. Nevertheless, one other study was also unable to find associations between body image and the stage of pubic hair growth in girls aged 9 to 12 years [40]. On the other hand, regarding breast development, the authors [40] observed that girls in more advanced stages were more concerned with their body.

With respect to menarche, the lack of associations with body dissatisfaction observed in the present study contrasts with most studies reported in the literature. In Jordan [8] and Australia [41], post-menarcheal adolescent girls were more concerned with their body than pre-menarcheal girls. In addition, some investigators observed an association between early menarche and greater body image preoccupation [17, 42, 43]. On the other hand, Stice and Whitenton [4] did not find associations between body dissatisfaction and menarche in American adolescent girls aged 11 to 15 years. Longitudinal studies are needed to better explore the relationship between body image concerns and sexual maturation.

Some limitations of the present study should be mentioned: 1) the cross-sectional design does not permit to establish a cause-effect relationship between the studied variables and only allows for analysis of a general overview of the situation where it can be assumed that some behaviors may have since changed; 2) only adolescents from state public schools were studied, possibly comprising the representation of higher socioeconomic classes; 3) the age range established for the sample limited the inclusion of prepubertal adolescents (in terms of the stage of pubic hair development and breast growth), a fact that might have influenced the results regarding the association between body image and sexual maturation; 4) most of the data was obtained via questionnaire, which, being a subjective form of assessment, cannot guarantee the accuracy of the provided answers. Despite these limitations, this study contributes to the understanding of body dissatisfaction among Brazilian adolescent girls and is the first to examine its relationship with socio-demographic, biological and behavioral factors in this population. Moreover, the strengths of the study included: 1) a large sample size, where the adolescents were selected through sampling strategies that ensured representativeness therefore increasing the internal validity of the study; 2) use of validated questionnaires; 3) achievement of objective measures of body fat; and 4) inclusion of indicators of sexual maturation.

Conclusions

This study found a considerable prevalence of body image concerns among Brazilian adolescent girls. Additionally, it identified the age group, level of body adiposity, and risk behaviors for anorexia and bulimia as significant correlates of body image concerns in this specific population. These findings suggest that adolescents, especially those aged 13 to 14 years, presenting excessive body fat, and exhibiting risk behaviors for the development of eating disturbances are more likely to experience body image problems. Therefore, having screening procedures in place for this gender and age group and developing effective interventions to improve body image and thus reduce over-preoccupation with appearance, are extremely relevant within this specific population. Ultimately, success in intervening on body image change will far more likely contribute to the prevention of eating disorders in the adolescent population and is another matter of increasing relevance in our society. Further studies on this topic, and involving other regions of Brazil, are needed to provide data for different sociocultural contexts. In addition, studies including adolescents above 14 years of age are necessary to track body image problems and associated correlates at older ages. Finally, longitudinal studies should also be conducted to analyze the relationship between body image concerns and sexual maturation among other variables.

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Paper received by the Editors: September 3, 2013

Paper accepted for publication: December 6, 2013

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