

## Who are the children with adequate weight who feel fat?

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### Abstract

**Objective:** To measure the prevalence of children with adequate weight who feel fat and to examine the factors associated with this perception.

**Methods:** Cross-sectional study with 901 schoolchildren aged 8-11 years selected by cluster sampling. The children had their weight and height measured, and answered a questionnaire that included a self-esteem scale and questions on self-perception of weight, and perception of parents' and friends' expectations regarding the child's weight.

**Results:** The prevalence of children with BMI percentile < 85 who considered themselves fat was 13%, and the variables significantly associated with this perception were: female gender (OR = 2.45; 95%CI 1.42-4.24), 11 years of age (OR = 2.35; 95%CI 1.13-4.89), lowest quartile of self-esteem (OR = 2.08; 95%CI 1.17-3.68), the perception that parents expect them to be thinner (OR = 3.00; 95%CI 1.52-5.91), and body mass index percentile (OR = 1.04; 95%CI 1.03-1.06).

**Conclusion:** The perception of being fat when having adequate weight afflicts children before preadolescence, particularly girls aged 11 years, with higher body mass index, lower self-esteem, and who think their parents expect them to be thinner. Future studies should examine in depth the causes and consequences of this attitude.

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### Introduction

Nowadays a collective fantasy of the ideal body and of physical fitness has generated what some authors call "normative discontent."<sup>1</sup> In Porto Alegre (RS), for example, it was observed that only 1/3 of those women aged 12 to 29 years who wanted to weigh less actually had a body mass index (BMI) compatible with overweight/obesity.<sup>2</sup> Studies with Brazilian schoolchildren have also described a high prevalence of body dissatisfaction and weight loss behaviors, oftentimes inappropriate.<sup>3-6</sup>

Children learn early from their families and social environment, to value a slender body,<sup>7</sup> and many of them, even with appropriate body weight, report dissatisfaction

with their bodies, engaging in attempts to lose weight.<sup>8</sup> Fear of obesity may be creating body image distortions among children and adolescents, leading to behaviors that might be damaging to their health, such as inadequate nutrient intake, with consequent impairment of cognitive development and increased risk of eating disorders in subsequent years.<sup>6,9</sup> This study aimed to investigate the prevalence of children with appropriate weight who feel fat and the factors associated with this perception.

### Methods

This is a cross-sectional study evaluating a representative sample of schoolchildren aged 8 to 11 years living in Porto Alegre, RS, Brazil.<sup>10</sup>

The cluster sample size calculation indicated a minimum of 946 subjects, proportional to the size of the school network (98,210 students). Forty-three schools were selected by systematic sampling (25 from the state education system, 8 from the municipal system and 10 private schools). Twenty children were selected from each school, also by systematic sampling.

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The schoolchildren were interviewed individually at school, taking into account the fact that some children might not be fully literate. They were asked about their perception of their parents' expectations regarding their weight ["Would your mom and/or dad like you to be thinner?"]; their perception of their friends' expectations regarding their weight ["Would your friends like you to be thinner?"]; and their own feelings about their weight ["Do you think you are fat, normal or thin?"].

The Culture-Free Self-Esteem Inventory for Children<sup>11</sup> was applied to assess the subjects' self-esteem. This instrument is composed of 20 items and four subscales – general, parental, academic and social self-esteem – and has been validated for English-speaking samples. Linguistic validation for Portuguese was performed with the prior authorization of the authors by means of two translations done by independent translators, followed by two backtranslations by translators whose native language is English. After being divided in quartiles, children were categorized into two strata: those whose scores were equal to or below the 25th percentile (lower self-esteem quartile) and all others.

Weight and height were measured using portable scales and anthropometers calibrated by the National Institute of Metrology, Standardization and Industrial Quality. Children were defined as having appropriate weight for their height if their BMI was below the 85th percentile.<sup>12</sup>

All analyses accounted for the study design effect (cluster sampling) when comparing children with and without overweight by logistic regression. The magnitude of the association of feeling fat and the study variables (sex, age, type of school, BMI percentile, self-esteem score and perception of parents' and friends' expectations regarding the child's weight) was initially measured by simple logistic regression, and then by multivariate logistic regression, including in the final model only those variables that were associated with feeling fat at a level of significance of 0.2 or less in the bivariate analysis. The software used was Epi-Info 6.0 and Stata for Windows 6.0.

This project was approved by the Research Ethics Committee at Hospital de Clínicas de Porto Alegre and by the Municipal and State Education Departments in conjunction with each school's principal. Parents and/or legal guardians signed informed consent, as did all of the children who agreed to participate.

## Results

All of the selected schools agreed to participate. There were 5% (n = 45) of losses, resulting from students who refused to take part or whose parents did not give authorization. The final sample included 901 subjects.

Approximately 3/4 of the sample (n = 684 or 75.9%) had a BMI below the 85th percentile, 12.9% (n = 88) of whom thought they were fat, accounting for 38.1% of all those children who thought they were fat (n = 231). More girls (17%) than boys (9%) fell into this category. The bivariate analysis revealed that the schoolchildren who were not overweight, but thought they were fat, were mostly female (p = 0.001), with 11 years of age (p = 0.191), with a higher BMI (p = 0.000), lower self-esteem (p = 0.000) and who thought their parents and friends would like them to be thinner (both p = 0.000).

Table 1 contains the non-adjusted and adjusted odds ratios for feeling fat without being overweight. After adjustment, the following characteristics were associated with feeling fat: female sex (OR 2.45; 95%CI 1.42-4.24), 11 years of age (OR 2.35; 95%CI 1.13-4.89), lower self-esteem (OR 2.08; 95%CI 1.17-3.68) and the perception that parents would like them to be thinner (OR 3.00; 95%CI 1.52-5.91). In addition, BMI was also associated with feeling fat. For each percentage point increase in BMI, the chance of the child feeling fat increased by 4%.

## Discussion

This is the first Brazilian population based study that has looked at the prevalence of children who feel fat without being overweight and at the factors associated with this misperception. We believe that the results can be generalized for the entire population of Porto Alegre in the selected age group, since the level of school attendance among children aged 7 to 14 years in this region is 96.5%.<sup>13</sup>

The prevalence rates observed in this study, although significant, are below those reported in a study undertaken in Australia,<sup>14</sup> where 30% of girls and 13% of boys between 8 and 12 with normal weight expressed a desire to be slimmer. Erling & Hwang<sup>15</sup> studied 10 year-old Swedish children and found that, among children who reported feeling fat, only 30% were actually overweight. It is possible that these differences may be due to distinct methods of assessing body image in children, (feeling fat may not mean the same as wishing to be thinner), the sampling methods used and cultural differences among the investigated groups.

Being female was significantly associated with feeling fat in this study. Another study has also demonstrated sex differences in children's body image, with more girls desiring to be thinner than boys.<sup>3,6,15-17</sup> It is possible that the stereotype of the ideal body is incorporated sooner by females, during early childhood. On the other hand, the body ideal for boys could be related to an athletic and muscular physique.<sup>18</sup>

In the present study, older children were more likely to feel fat. Other authors have also shown that

dissatisfaction with one's own body becomes more pronounced as age increases.<sup>7,14,17,19</sup>

The desire for a thinner body was more prevalent among children who had a higher BMI.<sup>15,20</sup> In this study, even among children who were not overweight, BMI was associated with feeling fat, revealing a conflict between the standards of normality set by the scientific community and prevailing standards of beauty. This finding is clinically relevant, since body dissatisfaction and weight concerns among prepubescent children are associated with eating disorders symptoms in adolescence, particularly among young females.<sup>9</sup>

A negative body image has been viewed as a facet of poor self-esteem and self-image.<sup>20-22</sup> The findings of this study reinforce this concept since children with appropriate weight, but with lower self-esteem had twice the chance of feeling fat, when compared with those who had higher self-esteem.

The variable most strongly associated with feeling fat among children who were not overweight was their perception of parents' expectations regarding their weight.

Children who felt that their parents would prefer them to be thinner had a three-fold higher chance of feeling fat. This finding corroborates the idea that, until the first years of adolescence, parents exert a great deal of influence on their children's appearance and style.<sup>23-25</sup> On the other hand, it is possible that the child's perception of the parents' expectations in relation to his or her weight is distorted and amplified as a result of the negative body image that the child has. Another factor to be considered is the role models that parents offer their children. Could these children be actually reflecting a negative body image that is not theirs, but their parents'? Some studies have revealed a positive correlation between parents' weight concerns and body esteem difficulties and weight preoccupations in their children.<sup>22-24,26,27</sup>

This research has the merit of having generated information hitherto unknown in Brazil, that can be used as a starting point for a debate among health professionals, educators and parents on the existence of exaggerated concerns with weight and body image distortions in prepubescent children who are not overweight, ultimately

**Table 1** - Non-adjusted and adjusted odds ratios for the perception of feeling fat among children with BMI percentile < 85 (n = 684) (Porto Alegre, Brazil)

Variable	Children think they are fat		Non-adjusted OR	Adjusted OR
	Yes n (%)	No n (%)		
Sex				
Female	58 (17.2)	280 (82.8)	2.17 (1.35-3.48)	2.45 (1.42-4.24)
Male	30 (8.7)	315 (91.3)	1.00	-
School				
Private	12 (9.7)	112 (90.3)	0.68 (0.35-1.29)	-
Public	76 (13.6)	483 (86.4)	1.00	-
Age (years)				
8	20 (11.9)	148 (88.1)	1.00	-
9	17 (9.7)	159 (90.3)	0.79 (0.39-1.57)	1.05 (0.47-2.39)
10	26 (13.5)	167 (86.5)	1.15 (0.61-2.15)	2.09 (0.99-4.42)
11	25 (17.1)	121 (82.3)	1.52 (0.8-2.89)	2.35 (1.13-4.89)
BMI percentile			1.04 (1.03-1.05)	1.04 (1.03-1.06)
Self-esteem score percentile				
≥ 25	40 (21.3)	148 (78.7)	2.51 (1.58-3.97)	2.08 (1.17-3.68)
> 25	48 (9.7)	446 (90.3)	1.00	-
Would parents prefer child to be thinner?*				
Yes	41 (37.3)	69 (62.7)	6.75 (4.13-11.04)	3.00 (1.52-5.91)
No	46 (8.1)	523 (91.9)	1.00	-
Would friends prefer child to be thinner?*				
Yes	34 (29.6)	81 (70.4)	3.97 (2.42-6.49)	1.52 (0.73-3.14)
No	54 (9.5)	512 (90.5)	1.00	-

BMI = body mass index; OR = odds ratio.

\* Child's perception

aiming at the implementation of strategies to foster a more positive body image among children in this age group.

Future qualitative research is necessary to examine in greater depth the reasons that lead children who are not overweight to feel fat, as well as the importance of family and sociocultural influences and their relationship with self-esteem.

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