Original Article

Parents' and boys' perceptions of boys' body size for average and high BMI boys

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Abstract

A study on 49 preadolescent boys and their parents was performed to determine if differences existed in boys' body esteem and body size perceptions and to determine how accurately parents perceive their sons' body size. The boys were grouped by their body mass index (BMI) into average and high BMI groups. The boys completed the Body Esteem Scale; the boys and the parents rated the boys' body size perceptions. No differences were found in the boys' body esteem. The boys in the high BMI group perceived themselves as bigger than the boys in the average BMI group, and the parents of the boys with a high BMI perceived their sons as bigger. The boys in the high BMI group rated their current figure as heavier than their ideal figure. The results supported that the boys and the parents were aware of the boys' current body size. However, the parents of the boys with high BMI were more accepting of a larger ideal body figure.

Keywords: parent, perception, body size, BMI, boy, overweight.

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Introduction

Overweight in children has risen dramatically in the last few decades (Ogden *et al.* 2006). Serious health consequences have been linked to childhood overweight, including high blood pressure, type 2 diabetes, early onset of atherosclerosis, sleep apnoea and many others (Daniels 2006). Additionally, the psychosocial consequences of childhood overweight can be equally as harmful (Eisenberg *et al.* 2003; Latner & Stunkard 2003). Parents play an important role in shaping the health and environment of their children (Birch & Davison 2001). Families' self-awareness of their

current dietary and physical activity behaviours, which may be contributing to childhood overweight, is important in identifying areas for lifestyle change (Daniels *et al.* 2009). If this is to occur, then an accurate assessment of a child's weight status and risk is a key element to preventing and treating childhood overweight. In addressing weight issues with families of overweight children, one step in this process should also be an examination of parents' and children's awareness of children's body size.

A majority of researchers studying parental perception of their children's weight status has revealed that parents' perceptions of their overweight children

are not accurate as most parents underestimate their children's overweight status (Maynard *et al.* 2003; Jeffery *et al.* 2005). Parents are less likely to recognize younger children as overweight compared with older children; however, many parents still underestimate the risk category for older children (Eckstein *et al.* 2006; West *et al.* 2008). In a large study that evaluated mothers' perceptions of their adolescents' weight status, 86% of mothers underestimated their overweight adolescents' weight status (Boutelle *et al.* 2004).

Most researchers that examine parents' perceptions of child weight status have included only mothers. A paucity of data exist exploring fathers' perceptions of their children's weight and body size. In one study that looked at both parents' perceptions of their children's weight, the researchers found that only one quarter of mothers and fathers identified their overweight children as overweight, indicating that fathers are also not recognizing their children's overweight status. Parents in this study were also more likely to recognize their daughters as overweight compared with their sons (Jeffery *et al.* 2005). If this is the case, are overweight boys not getting the care and attention they need?

When comparing girls' and boys' desires for the ideal body size, researchers have found that girls more frequently desire to be thinner compared with boys (Vander Wal & Thelen 2000; Welch *et al.* 2004); however, body concerns among boys are not uncommon (McCabe & Ricciardelli 2004). Researchers have found significant associations between body mass index (BMI) and body dissatisfaction in boys wherein boys who had a higher BMI desired to have a thinner body size (Thompson *et al.* 1999; Ambrosi-Randic 2000). In addition to focusing on achieving a slim body, preadolescent boys also focus on achieving a muscular physique (McCabe *et al.* 2005). Studying these issues among boys is important.

The current study is designed to evaluate the current and ideal body size perceptions of preadolescent boys in relation to their BMI status (at risk for overweight or overweight vs. healthy weight) and parents' perceptions of their sons' current and ideal body sizes. The differences in perceptions of body size among mothers, fathers and boys in relation to boys' BMI status were also examined. Additionally, preadolescent boys' body esteem and desire for muscularity were assessed.

Materials and methods

Participants

Forty-nine preadolescent boys between the ages of 8 and 10 years old and their parents completed the study. The participants were recruited from a Southeastern city in the US by using advertisements in the local press and by flyers inviting Caucasian mothers and their sons (ages 8–10 years) to participate in a children's nutrition study. Further details regarding this study have been published previously (Brann & Skinner 2005). During the telephone screening, the mothers were asked to report their sons' current heights and weights, and from these estimates, the BMI was calculated for each boy. The boys were placed into an average BMI group or a high BMI group based on their BMI percentile using Centers for Disease Control growth charts for the US (Kuczmarski *et al.* 2000). The average BMI group was composed of boys whose BMI percentile fell between the 33rd and the 68th percentile, whereas the high BMI group was made up of boys whose BMI percentile was greater than or equal to the 85th percentile. The boys in the high BMI group would be considered either at risk of overweight (BMI between the 85th and 95th percentile) or overweight (BMI percentile $\geq$ 95th percentile) according

Key messages

- Better understanding of parents' and children's perceptions of boys' body size may aid health professionals in assisting families make needed health behaviour changes.
- Future research is warranted to explore the relationship between body size perceptions and health behaviour change.

to the Centers for Disease Control and Prevention growth chart (Kuczmarski *et al.* 2000). The boys whose BMI percentile fell between the 69th and the 84th percentile were intentionally excluded from the study to ensure a potentially greater separation in the study variables between the groups as this was a component of a larger study that evaluated child feeding and weight with preadolescent boys (Brann & Skinner 2005). All of the boys were Caucasian and had no history of chronic or metabolic disease.

The mother/son pairs were interviewed separately by the author in their homes, and the mothers were given the father's questionnaire and the father's consent form. The fathers were asked to fill out these forms at a convenient time and return the forms to the researchers. This study was approved by the University of Tennessee Institutional Review Board for research involving human subjects. The mothers' consent and the boys' assent were obtained prior to beginning the interview.

Demographic and weight status information

The mothers provided information about occupation and education level for both parents. Using the Hollingshead Index, socio-economic status (SES) scores were calculated from the occupation and education of the family's primary wage earner(s) (Hollingshead 1976). The scores can range from a low of eight to a high of 66; higher scores indicate higher SES. The mothers also reported the heights and the weights for both parents, and the BMI for each parent was calculated.

In order to verify the mothers' estimates of their sons' heights and weights, the author weighed and measured the boys using established protocol (Lee & Neiman 1996) during the personal in-home interview. Both measures were taken twice, averaged and BMI was calculated and converted into percentiles using Statistical Analysis Software (SAS) version 8.1 (SAS Institute, Cary, NC). If the boy's measured BMI did not fit within the specified average BMI or high BMI groups, his data were excluded from the analyses ($n = 8$).

Body size perceptions

Figure drawings (Collins 1991) were used to examine the boys' ideas of their current body size and the size that they would like to be. There were seven drawings of boys' silhouettes, which ranged from very thin (body silhouette one) to very heavy (body silhouette seven). Test-retest reliability for the figure rating tasks for children as young as 8 years of age has been found to be high (Wood *et al.* 1996). The mothers and the fathers rated their sons' current body size and ideal size of a boy using the same figure rating scale given to the boys.

The boys' body esteem and desire for muscularity

The boys completed the Body Esteem Scale (BES; Mendelson & White 1982), which assessed different aspects of body esteem in children with emphasis on feelings about appearance and feelings about body weight. This 24-item scale used a yes/no format, where a higher score indicated more positive feelings about their appearance. Mendelson & White (1982) reported that the scale had good split-half reliability ($r = 0.85$) and good construct validity with the Physical Appearance and Attributes subscale of the Piers-Harris Children's Self-Concept Scale ($r = 0.67$). The measure of internal consistency for the BES with the sample population was modest (Chronbach's $\alpha = 0.455$). As a way of examining the boys' desire for muscularity, the boys were asked the question 'in the past year, how often have you wanted to have more muscles?' Response options was composed of never, sometimes or a lot.

Statistical analyses

Means and standard deviations were computed for variables that were related to the characteristics of the participants by their BMI groups. The body esteem data were not normally distributed and the figure drawing selections were ordinal variables; therefore, non-parametric tests were performed (Harris *et al.* 2008). Mann-Whitney tests were performed to examine if differences in body esteem

existed between the groups and to assess differences in the participants' perceptions of the figure drawings by the boys' BMI groups. Differences within the groups were tested using the Wilcoxon signed-rank test. Analyses were run using SPSS version 16 for Windows (SPSS, Inc., Chicago, IL).

Results

Participants

The demographic and weight status information of the participants separated by the boys' BMI groups are found in Table 1. No significant difference was found for age of the boys by their BMI groups. As planned, the two groups did differ significantly in their mean BMI. The mean age and BMI of the parents did not differ significantly by their sons' BMI group. The mothers and the fathers had mean BMIs of 25.8 kg m⁻² and 27.0 kg m⁻², respectively, indicating that both the mothers and the fathers were, on average, slightly overweight (BMI ≥ 25). On average, both groups of boys came from families of middle to upper SES.

Body size perceptions

Counts and percentages for each current and ideal boy figure selected by the boys in the average and

high BMI groups and their parents are found in Table 2. Table 3 shows the medians and ranges of the participants' perceptions of the child figure drawings by the boys' BMI groups. A lower score would represent a thinner boy figure and a higher score would represent a heavier boy figure. The boys in the high BMI group perceived themselves as bigger than the boys in the average BMI group, yet their perceptions of the ideal boy figure did not differ. The mothers and the fathers of the boys with a high BMI rated their sons as being heavier and chose a heavier ideal boy body size compared with the mothers and the fathers of the boys with an average BMI.

No significant differences were found in the ratings of the current vs. the ideal boy figure for the boys in the average BMI group, but the boys in the high BMI group rated their current figure as heavier than their ideal boy figure. The mothers of the boys with an average BMI chose an ideal figure that was heavier than their sons' current figure. The mothers and the fathers of the boys with a high BMI chose an ideal figure that was thinner than their sons' current figure.

In terms of differences for body size perceptions between the boys, the mothers and the fathers, no significant differences were found between pairs for the current boy and ideal boy figures within the average BMI group. For the high BMI group, significant differences were found between the mothers and the boys, and the fathers and the boys for the current boy figure, with the mothers and the fathers selecting a larger current figure compared with the boys. The same was true with the ideal boy figure with the participants in the high BMI group. The mothers and the fathers selected a larger ideal figure compared with the boys. No significant differences were found between the mothers and the fathers for either the current or ideal boy figures.

Boys' body esteem and desire for muscularity

No significant differences were found between the groups for the BES [average BMI group median (range) = 12.0 (7.0–19.0); high BMI group median (range) = 12.0 (9.0–16.0); $P = 0.709$]. The median for all of the boys was 12.0, indicating that the boys had moderate levels of body esteem on the 24-item scale.

Table 1. Means and standard deviations of selected characteristics of the boys by their body mass index (BMI) groups

	BMI groups	
	Average BMI [†] group ($n = 25$)	High BMI [‡] group ($n = 24$)
SES [§]	51.92 ± 9.35	53.23 ± 9.36
Age (years)		
Boys	9.36 ± 0.85	9.22 ± 0.79
Mothers	39.28 ± 4.87	38.17 ± 4.93
Fathers	42.88 ± 6.35	40.65 ± 4.75
BMI (kg m ⁻²)		
Boys	16.44 ± 0.854*	21.43 ± 2.95
Mothers	25.28 ± 6.02	26.30 ± 4.43
Fathers	26.64 ± 3.65	27.35 ± 3.67

*Significant difference between groups at $P < 0.0001$; [†]Average BMI boys = boys with a BMI percentile between the 33rd and the 68th; [‡]High BMI boys = boys with a BMI percentile ≥ 85th; [§]SES = socioeconomic status determined from occupation and education of parents.

Table 2. Counts (percentages) of current and ideal boy figures* selected by boys, mothers, and fathers based on boys' body mass index (BMI) groups

	Figure #1	Figure #2	Figure #3	Figure #4	Figure #5	Figure #6	Figure #7
Boys' figure selections							
Current figure							
Average BMI group [†] (n = 25)	0 (0)	0 (0)	11 (44)	14 (56)	0 (0)	0 (0)	0 (0)
High BMI group [‡] (n = 24)	0 (0)	0 (0)	1 (4)	17 (68)	6 (24)	1 (4)	0 (0)
Ideal figure							
Average BMI group (n = 25)	0 (0)	0 (0)	12 (48)	10 (40)	3 (12)	0 (0)	0 (0)
High BMI group (n = 24)	0 (0)	1 (4)	9 (36)	13 (52)	2 (8)	0 (0)	0 (0)
Mothers' figure selections							
Current figure							
Average BMI group (n = 25)	0 (0)	2 (8)	10 (40)	13 (52)	0 (0)	0 (0)	0 (0)
High BMI group (n = 24)	0 (0)	0 (0)	0 (0)	11 (44)	11 (44)	2 (8)	0 (0)
Ideal figure							
Average BMI group (n = 25)	0 (0)	0 (0)	6 (24)	19 (76)	0 (0)	0 (0)	0 (0)
High BMI group (n = 24)	0 (0)	0 (0)	2 (8)	18 (72)	5 (20)	0 (0)	0 (0)
Fathers' figure selections							
Current figure							
Average BMI group (n = 14)	0 (0)	0 (0)	8 (57)	6 (43)	0 (0)	0 (0)	0 (0)
High BMI group (n = 17)	0 (0)	0 (0)	0 (0)	5 (30)	9 (53)	3 (17)	0 (0)
Ideal figure							
Average BMI group (n = 14)	0 (0)	0 (0)	6 (43)	8 (57)	0 (0)	0 (0)	0 (0)
High BMI group (n = 17)	0 (0)	0 (0)	2 (12)	10 (58)	5 (30)	0 (0)	0 (0)

*Collins 1991; Figure drawings range from 1 (very thin) to 7 (very heavy). Reprinted with permission from John Wiley and Sons, Inc. [†]Average BMI boys = boys with a BMI percentile between the 33rd and the 68th. [‡]High BMI boys = boys with a BMI percentile $\geq$ 85th.

A similar number of boys in each group reported the desire for muscularity. Twenty-two of the 25 boys in the average BMI group and 19 out of the 25 high BMI groups reported wanting to have more muscles either sometimes or a lot in the past year.

Discussion

The boys in this study had similar ideas of how they would like to look regardless of their current weight status. The boys from the high BMI group chose a larger current body size figure and a similar ideal body size figure compared with the boys in the

average BMI group, which indicates greater body dissatisfaction between the current and the ideal figures for the boys in the high BMI group. Other researchers also have found that body dissatisfaction was greater among overweight children as compared with normal-weight children (Vander Wal & Thelen 2000; Olvera *et al.* 2005).

Results from the current study indicate that the parents of the boys with a high BMI did recognize that their sons were heavier compared with the parents of boys with an average BMI. Eckstein *et al.* (2006) found similar results with parents of children who were at risk for overweight or overweight. These

Table 3. Medians and ranges of boys', mothers', and fathers' perceptions of current and ideal boy figures by boys' body mass index (BMI) groups

Figure drawing ratings [†]	Median (range)		<i>P</i> values		
	Average BMI group	High BMI group	Average vs. high [*]	Current vs. ideal	
				Average BMI group [‡]	High BMI group [§]
Boys'	(<i>n</i> = 25)	(<i>n</i> = 24)			
Current boy figure	4.0 (3.0–4.0)	4.0 (3.0–6.0)	0.001	0.414	0.001
Ideal boy figure	4.0 (3.0–5.0)	4.0 (2.0–5.0)	0.916		
Mothers'	(<i>n</i> = 25)	(<i>n</i> = 24)			
Current boy figure	4.0 (2.0–4.0)	5.0 (4.0–7.0)	0.001	0.018	0.001
Ideal boy figure	4.0 (3.0–4.0)	4.0 (3.0–5.0)	0.006		
Fathers'	(<i>n</i> = 14)	(<i>n</i> = 17)			
Current boy figure	3.0 (3.0–4.0)	5.0 (4.0–6.0)	0.001	0.157	0.001
Ideal boy figure	4.0 (3.0–4.0)	4.0 (3.0–5.0)	0.011		
Selection [¶] of current figures (<i>P</i> values)					
Mothers and sons	0.394	0.008			
Fathers and sons	0.258	0.008			
Mothers and fathers	0.059	0.999			
Selection ^{††} of ideal figures (<i>P</i> values)					
Mothers and sons	0.740	0.022			
Fathers and sons	0.739	0.013			
Mothers and fathers	0.655	0.999			

**P* values correspond to Mann–Whitney tests between the average and high BMI groups of boys', mothers or fathers. [†]Collins, 1991; Figure drawings range from 1 (very thin) to 7 (very heavy). [‡]*P* values correspond to the Wilcoxon signed-rank tests between ratings of the current and ideal figures of boys, mothers or fathers from the average BMI group. [§]*P* values correspond to the Wilcoxon signed-rank tests between ratings of the current and ideal figures of boys, mothers or fathers from the high BMI group. [¶]*P* values correspond to the Wilcoxon signed-rank tests between ratings of current boy figures for mothers and boys, fathers and boys, and mothers and fathers. ^{††}*P* values correspond to tests between ratings of ideal boy figures for mothers and boys, fathers and boys, and mothers and fathers.

researchers found that parents were more likely to choose a heavier figure to identify their child. Interestingly, in the current study, the parents of the boys with a high BMI selected a heavier boy figure as ideal compared with the ideal chosen by the parents of the boys with an average BMI. On average, the parents of the boys with an average BMI selected a slightly larger figure as ideal compared with the figure selected to represent their sons' current body size. This seems to support the literature around acceptance of a larger body size for boys and the desire for a stronger and more muscular physique for boys (Cohane & Pope 2001).

Agreement between family members to recognize the overweight status of children is important. In this study, the families of the boys in the average BMI group were in agreement about the boys' current and ideal figures. This was not true for the families of the boys in the high BMI group. Both the mothers and the

fathers chose figures that were larger than their sons' chosen figures for the current and the ideal size figures. This discrepancy may be an issue in dealing with childhood overweight if parents are more accepting of a larger body size and less willing to make family lifestyle changes. However, this warrants further exploration.

Body esteem, which evaluates children's feelings about their appearance and weight, did not differ between the boys with an average BMI and the boys with a high BMI in this study. This finding is inconsistent with the literature. Other researchers have found a significant negative association between body esteem and body fat and weight in boys (Mendelson *et al.* 1996; Duncan *et al.* 2004). The scores on the BES for the boys in this study were slightly lower than the scores reported in the literature (Flannery-Schroeder & Chrisler 1996; Duncan *et al.* 2004). A majority of the boys in both groups indicated that they wanted to be

more muscular. This finding is supported by researchers who have found that having muscles was important for both normal-weight and overweight preadolescent boys (McCabe *et al.* 2005).

One limitation of this study is the small sample size. This study evaluated the parents' perceptions of their sons' body size based on their son's weight status in an attempt to capture both the mothers' and the fathers' perceptions of their sons. Most of the literature on parental perceptions of children's body size is limited to mothers' perceptions. Unfortunately, even after a few attempts to collect data from the fathers, the fathers were less willing to participate than the mothers, primarily because of self-reported lack of time. Additionally, the sample was composed of Caucasian participants from middle to upper SES, which does not allow for generalization to other races/ethnicities and economic classes.

The reason for examining awareness of parental perceptions of their children's body size is based on the premise that if the parents are aware, they will be more likely to take action to make behavioural changes. Rhee *et al.* (2005) found that parents who viewed their overweight children as being above average weight were significantly more likely to be in a state of readiness to help their children lose weight. Parental involvement is a key component in interventions to improve diet and physical activity behaviours among overweight children (Golan & Crow 2004; Wrotniak *et al.* 2005). Research is needed to examine the direct relationship between parents' perceptions of their overweight children's weight status and their actions in helping improve their children's diet and physical activity behaviours. Also, additional research is needed to examine the concordance of body size perceptions among parents and children to explore whether this impacts behaviour change.

Results from this study support the idea that boys and parents were aware of their sons' current body size. However, parents of boys with high BMI were more accepting of a larger ideal body figure. Parents of boys need to recognize the implications of childhood overweight and address the issue with lifestyle changes. If weight loss or weight maintenance intervention is warranted, practitioners should discuss with parents and boys their perceptions of body

size in order to develop healthy weight management goals.

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Conflicts of interest

The author declares that she has no conflicts of interest.

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