

## The effect of perceived body shapes on the desire to be thin in fifth and sixth graders in elementary school

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### Abstract

In this study, we ascertained the situation regarding distorted perceptions of body shape, which are becoming apparent in young children, from questionnaire surveys targeting fifth and sixth graders in elementary school. We conducted research and an investigation in order to study the impact on their desire to be thin caused by perceptions of obesity and their own body shapes. Subsequently, obsessions with being thin were seen in not only girls but also boys. Yet, in the desired body shape category, a significantly large percentage of girls in the group over-evaluated. Consequently, recognition of their body shapes and a desire to be thin can be said to be related to girls in fifth and sixth grade. In this study, fifth and sixth graders' obsessions with being thin and aversion to being fat became partially clear. It is necessary to recognize their body shapes correctly so that children whose height and weight will increase as secondary sexual characteristics appear do not end up being on a wrong diet and do not become extremely obsessed with being thin. To this end, a correct understanding of their own growth and development plus positive recognition are considered to be important. Furthermore, it is necessary to increase awareness not only in children in puberty when they increase their self-consciousness but also in young children, and it is considered that this will lead to retention and improvement of children's mental and physical health in the future.

**Key words:** perceived body shapes, desired body shapes, desire to be thin, obesity index

### ❖ Introduction

In recent years, the increased desire of young women to be thin is remarkable and because this is considered to have resulted from the strong influence of the mass media, etc. as well as fashion trends towards a skinny body shape, incorrect dieting techniques and a social trend of "admiration towards becoming skinny" have affected our tenacity to "be thin" in addition to our creation of distorted body images<sup>1)</sup>.

Pubescent children start to become very conscious of their own bodies and interest in their bodies increases

rapidly due to sudden physical development and sexual maturation. They worry too much about their looks and body shapes and tend to have a sense of personal inferiority when comparing their own image with others<sup>2)</sup>. Pubescent children and adolescents who have not yet established their own selves tend to accept the body images that are provided by the mass media. One report indicated that children in elementary school also have distorted body images and evaluated their body shapes as "fat" even if they are not fat<sup>3)</sup>. Furthermore, the relationship with self-esteem has attracted some attention as a cause of distorted perceived body shapes.

Although studies on the relationship between eating behaviors and the desire to be thin or perceived body shapes<sup>4)</sup> as well as studies on the relationship between self-esteem and the desire to be thin or perceived body shapes<sup>5, 6)</sup> can be found in previous studies, there are few studies on how these distorted perceived body shapes, that can be considered to be a cause of the desire to be thin, affect the obesity index. Furthermore,

Received: May 29, 2012

Accepted: August 2, 2012

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studies on the desire to be thin and perceived body shapes mostly target junior high and high school students or adults, with studies targeting elementary school students being very rare.

In this study, we recognized the situation regarding distorted perceived body shapes, which is becoming apparent in young children, by targeting fifth and sixth graders and researched and examined the effects on the obesity index and the desire to be thin. In addition, we set out to examine support that can help them recognize and accept their own body shape correctly depending on the development stage they are in.

## ❖ Materials and Methods

### *Survey period and survey target and method*

We conducted a survey from early to mid-February 2010. 259 children (85 male students in fifth grade, 64 female students in fifth grade, 65 male students in sixth grade, and 45 female students in sixth grade) were targeted for analysis. The subjects of no response about height and weight were excluded in analysis of the obesity index. Homeroom teachers in each class provided and collected unregistered self-administered questionnaires during homeroom activities.

### *Survey content*

Grade, sex, height, and weight as physical traits as well as the desire to be thin, perceived body shapes, and desired body shapes were surveyed.

### *Calculation and analysis*

With regard to the desire to be thin, we assigned 1 point for “strongly disagree,” 2 points for “disagree,” 3 points for “agree,” and 4 points for “strongly agree.” With regard to perceived body shapes, we assigned 1 point for “skinny,” 2 points for “a little skinny,” 3 points for “normal (just right),” 4 points for “a little fat,” and 5 points for “fat,” and with regard to desired body shapes, 1 point for “want to lose weight,” 2 points for “want to lose a little weight,” 3 points for “want to maintain current weight,” 4 points for “want to gain a little weight,” and 5 points for “want to gain weight.” The obesity index calculation was as follows.

$$\text{Obesity index (\%)} = \frac{\text{Measured weight (kg)} - \text{Standard body weight based on height (kg)}}{\text{Standard body weight based on height (kg)}} \times 100$$

Based on categorizations used by Tagawa et al.<sup>6</sup> and Okayasu et al.<sup>7</sup>, the group of students with an obe-

sity index of  $-10\%$  or lower who evaluated themselves as “fat,” “a little fat,” or “normal (just right)” and the group of students with an obesity index of  $-10\% - +10\%$  who evaluated themselves as “fat” or “a little fat” were categorized as the over-evaluation group, the group of students with an obesity index of  $-10\%$  or lower who evaluated themselves as “a little skinny” or “skinny” and the group of students with an obesity index of  $+10\%$  or higher who evaluated themselves as “a little fat” or “fat” were categorized as the correctly evaluated group, and the group of students with an obesity index of  $-10\% - +10\%$  who evaluated themselves as “skinny” or “a little skinny” and the group of students with an obesity index of  $+10\%$  or higher who evaluated themselves as “skinny,” “a little skinny,” or “normal (just right)” were categorized as the under-evaluated group.

### *Statistical analysis*

We graded each item and showed the average scores and standard deviations. With regard to the desire to be thin, we performed the Mann-Whitney U test on the relationship between the over-evaluated group and the correctly evaluated group in each grade and with both sexes. We performed all tests with significance levels 1% and 5%. We used the StatView 5.0 statistical software package (SAS Institute Inc., Cary, NC, USA) to process the statistics.

## ❖ Results

We calculated the average scores and standard deviations in height, weight, and obesity index (Table 1).

Average scores and standard deviations of items related to the desire to be thin are shown in Table 2. “Do not like to be considered fat” had high average scores in each grade and with both sexes. Girls had higher average scores than boys in everything other than “envious of people who are fat.” Girls had higher average scores than boys for each item. Sixth grade girls had a high average score in “do not like to be considered fat.”

Average scores and standard deviations in perceived body shapes and desired body shapes are shown in Table 3. Boys in each grade had high average scores.

The 11 subjects who did not respond about height and weight were excluded in analysis of the obesity index. The Relationship between perceived body shapes and the obesity index of the 248 subjects are shown in Table 4. Perceived body shapes are sorted by each

Table 1 Characteristics of subjects

	Fifth grade boys N=85	Fifth grade girls N=64	Sixth grade boys N=65	Sixth grade girls N=45
Height	144.2±7.6	146.7±6.4	149.6±8.6	151.4±5.7
Weight	36.6±8.4	39.2±8.0	41.1±8.3	42.1±8.1
Obesity index	-3.96±15.5	0.14±14.7	-1.82±11.9	-1.76±14.2

Table 2 Average scores and standard deviations of items related to the desire to be thin

Table 2-1 Fifth grade, sixth grade, boys, girls

Question items	Fifth grade N=149	Sixth grade N=110	Boys N=150	Girls N=109
Want to be considered to be skinny	1.8±1.0	1.9±0.9	1.7±0.9	2.1±0.9
Do not like to be considered fat	2.5±1.1	2.8±1.1	2.5±1.2	2.9±1.1
Envious of people who are skinny	1.8±1.0	1.8±0.9	1.6±0.8	2.2±1.0
Envious of people who are fat	1.4±0.7	1.4±0.6	1.4±0.7	1.4±0.7
Want to read articles or watch TV shows if they feature dieting	1.5±0.7	1.4±0.6	1.3±0.6	1.6±0.8

Table 2-2 Fifth grade boys and girls, sixth grade boys and girls

Question items	Fifth grade boys N=85	Fifth grade girls N=64	Sixth grade boys N=65	Sixth grade girls N=45
Want to be considered to be skinny	1.7±0.9	2.1±1.0	1.8±0.8	2.1±0.9
Do not like to be considered fat	2.3±1.1	2.8±1.1	2.7±1.2	3.0±1.0
Envious of people who are skinny	1.6±0.8	2.2±1.0	1.6±0.9	2.1±0.9
Envious of people who are fat	1.4±0.7	1.5±0.7	1.4±0.6	1.4±0.6
Want to read articles or watch TV shows if they feature dieting	1.3±0.6	1.7±0.9	1.4±0.6	1.5±0.6

Table 3 Average scores and standard deviations in perceived body shapes and desired body shapes

Table 3-1 Fifth grade, sixth grade, boys, girls

	Fifth grade N=149	Sixth grade N=110	Boys N=150	Girls N=109
Perceived body shapes	2.7±0.9	2.7±1.0	2.9±1.0	2.6±0.9
Desired body shapes	2.7±0.9	2.7±0.8	2.8±0.9	2.5±0.8

Table 3-2 Fifth grade boys and girls, sixth grade boys and girls

	Fifth grade boys N=85	Fifth grade girls N=64	Sixth grade boys N=65	Sixth grade girls N=45
Perceived body shapes	2.8±0.9	2.6±0.9	2.9±1.0	2.5±0.8
Desired body shapes	2.8±0.9	2.5±0.8	2.8±0.8	2.5±0.8

grade and sex (Table 5).

Relationship between perceived body shapes and the desire to be thin are shown in Table 6. We compared the findings using the Mann-Whitney U test regarding the desire to be thin between the over-evaluated group and the correctly evaluated group. No items showed a significant difference regarding the boys in both grades. Significant differences were seen in girls who answered “want to be considered to be skinny” ( $p<0.01$ ), “do not like to be considered to be fat” ( $p<0.01$ ), “envious of people who are skinny” ( $p<0.01$ ). No items showed a

significant difference in fifth grade boys. There was a high significance in “want to be considered to be skinny” ( $p<0.05$ ), “do not like to be considered to be fat” ( $p<0.05$ ), “want to read articles or watch TV shows if they feature dieting” ( $p<0.05$ ) in fifth grade girls in the over-evaluated group. Significant differences were seen for “do not like to be considered to be fat” ( $p<0.05$ ) in sixth grade boys. “Want to be considered to be skinny” ( $p<0.05$ ), “do not like to be considered to be fat” ( $p<0.05$ ), “envious of people who are skinny” ( $p<0.05$ ) were significantly high in sixth grade girls.

Table 4 Distribution of the relationship between perceived body shapes and the obesity index

perceived body shapes	Distribution of the obesity index					Sum total number
	<-20	-20~-10	-10~+10	+10~+20	+20<	
Fat	0	1	8	9	12	30
A little fat	0	6	32	9	6	53
Normal	2	43	75	5	1	126
A little skinny	6	17	8	0	0	31
Skinny	5	1	2	0	0	8
Sum total number	13	68	125	23	19	248
Over-evaluation group	2	50	41			93
Correctly evaluated group	11	18	74	18	18	139
Under-evaluated group			10	5	1	16

Table 5 Evaluation of the relationship between perceived body shapes and the obesity index sorted by each grade and sex

		Over-evaluation group	Correctly evaluated group	Under-evaluated group
Fifth grade	Boys N=82	31	48	3
	Girls N=63	23	39	1
Sixth grade	Boys N=59	16	33	10
	Girls N=44	23	19	2

Table 6 The comparison of the desire to be thin between over-evaluation and correctly evaluated group

Table 6-1 Fifth grade

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=54	Correctly evaluated group N= 87	
Want to be considered to be skinny	2.0±1.0	1.8±0.9	n.s.
Do not like to be considered fat	2.7±1.1	2.4±1.2	n.s.
Envious of people who are skinny	1.9±1.0	1.8±1.0	n.s.
Envious of people who are fat	1.3±0.5	1.5±0.8	n.s.
Want to read articles or watch TV shows if they feature dieting	1.6±0.8	1.4±0.7	n.s.

Table 6-2 Sixth grade

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=39	Correctly evaluated group N=51	
Want to be considered to be skinny	2.1±0.9	1.8±0.9	n.s.
Do not like to be considered fat	3.0±1.1	2.7±1.2	n.s.
Envious of people who are skinny	2.0±0.9	1.7±0.8	n.s.
Envious of people who are fat	1.2±0.5	1.5±0.7	n.s.
Want to read articles or watch TV shows if they feature dieting	1.4±0.6	1.4±0.5	n.s.

Table 6-3 Boys

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=47	Correctly evaluated group N=81	
Want to be considered to be skinny	1.7±0.8	1.8±0.9	n.s.
Do not like to be considered fat	2.4±1.2	2.5±1.2	n.s.
Envious of people who are skinny	1.4±0.7	1.6±0.9	n.s.
Envious of people who are fat	1.3±0.5	1.5±0.8	n.s.
Want to read articles or watch TV shows if they feature dieting	1.3±0.6	1.3±0.6	n.s.

Table 6-4 Girls

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=46	Correctly evaluated group N=57	
Want to be considered to be skinny	2.4±1.0	1.8±0.9	p<0.01
Do not like to be considered fat	3.3±0.8	2.6±1.1	p<0.01
Envious of people who are skinny	2.5±0.9	1.9±0.9	p<0.01
Envious of people who are fat	1.3±0.5	1.5±0.8	n.s.
Want to read articles or watch TV shows if they feature dieting	1.8±0.8	1.5±0.7	n.s.

Table 6-5 Fifth grade boys

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=31	Correctly evaluated group N=48	
Want to be considered to be skinny	1.6±0.9	1.7±0.9	n.s.
Do not like to be considered fat	2.4±1.1	2.3±1.2	n.s.
Envious of people who are skinny	1.4±0.7	1.7±0.9	n.s.
Envious of people who are fat	1.3±0.5	1.4±0.8	n.s.
Want to read articles or watch TV shows if they feature dieting	1.3±0.6	1.3±0.6	n.s.

Table 6-6 Fifth grade girls

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=23	Correctly evaluated group N=38	
Want to be considered to be skinny	2.4±1.0	1.9±0.9	p<0.05
Do not like to be considered fat	3.2±0.9	2.5±1.1	p<0.05
Envious of people who are skinny	2.5±1.0	2.1±1.0	n.s.
Envious of people who are fat	1.3±0.5	1.5±0.8	n.s.
Want to read articles or watch TV shows if they feature dieting	2.0±0.9	1.5±0.7	p<0.05

Table 6-7 Sixth grade boys

question items	Perceived body shapes		Significant difference
	Over-evaluation group N=33	Correctly evaluated group N=16	
Want to be considered to be skinny	1.7±0.7	1.8±0.9	n.s.
Do not like to be considered fat	2.4±1.3	2.8±1.2	p<0.05
Envious of people who are skinny	1.5±0.7	1.6±0.8	n.s.
Envious of people who are fat	1.2±0.4	1.5±0.7	n.s.
Want to read articles or watch TV shows if they feature dieting	1.3±0.5	1.3±0.5	n.s.

Table 6-8 Sixth grade girls

Question items	Perceived body shapes		Significant difference
	Over-evaluation group N=23	Correctly evaluated group N=19	
Want to be considered to be skinny	2.4±1.0	1.7±0.8	p<0.05
Do not like to be considered fat	3.4±0.7	2.5±1.2	p<0.05
Envious of people who are skinny	2.4±0.8	1.8±0.8	p<0.05
Envious of people who are fat	1.3±0.5	1.5±0.7	n.s.
Want to read articles or watch TV shows if they feature dieting	1.5±0.6	1.5±0.6	n.s.

## ❖ Discussion

In this research, we conducted surveys targeting fifth and sixth grade elementary school students with the intention of examining support that can help them recognize and accept their own body shapes correctly depending on the development stage they are in by understanding the situation regarding distorted perceived body shapes, which is becoming apparent in young children, and by focusing on how obesity indices and perceptions of their own body shapes affect their desire

to be thin.

Matsuhashi<sup>8)</sup> reported that early and mid-stages of puberty are periods when children become self-centered and excessively self-conscious. Katayama et al.<sup>9)</sup> reported girls from junior high school all the way up to university consistently worry to a high degree about how others view them and have a higher tendency to do so than boys. In this research, we can say that this tendency also became partially clear with children in fifth and sixth grade.

Based on reports by Monden<sup>10)</sup> and Yamamoto et



al.<sup>11)</sup>, there is a possibility of there being a relationship between subjective symptoms and obesity indices as children grow and develop.

Items in the desire to be thin, which impact obesity indices, include “want to be considered skinny” and “envious of people who are skinny” and children who “often consider” these 2 items had high obesity indices. A strong relationship was found with the item, “envious of people who are skinny,” in particular. In contrast, a significantly negative relationship with the item, “envious of people who are fat,” was found in boys, suggesting that the obesity index tends to be low in children who “often consider” this item. This result shows that fifth and sixth graders have physical values such as “skinny people” and “fat people” which are reflected in their obesity indices.

Relationships between the obesity indices and perceived body shapes as well as desired body shapes showed relationships in both items, but perceived body shapes are considered to strongly affect the obesity indices. Tanaka et al.<sup>2)</sup> reported that there are high correlations in both men and women with regard to the relationship between obesity indices and self-evaluations. Our research also showed a result that children with high scores in perceived body shapes had high obesity indices.

When we referred to categorizations by Tagawa et al.<sup>6)</sup> regarding perceived body shapes, 56.0% of people evaluated their own body shapes correctly in our research while 37.5% of people over-evaluated their own body shapes. Furthermore, Tagawa et al.<sup>6)</sup> reported that with regard to distorted perceived body shapes, there are more people who over-evaluate their body shapes with obesity indices of  $-20\% - -10\%$  and obesity indices of  $-10\% - +10\%$  and our research also showed the same results. In addition, Nishizawa et al.<sup>12)</sup> reported that only the overweight group of children from the first grade to sixth grade recognized their own body shapes correctly and our research showed similar results. Because we set a reasonable range for the obesity indices of  $-10\% - +10\%$  based on the categorization used by Tagawa et al.<sup>6)</sup> and because children who had obesity indices of  $+10\%$  or above and evaluated themselves as “a little fat” and “fat” were categorized in “the correctly evaluated group,” the overweight group had more children who correctly evaluated their body shapes.

With regard to desired body shapes, 37.0% of children answered “want to lose weight” and “want to lose a little weight,” 49.0% answered “want to maintain cur-

rent weight,” and 14.0% answered “want to gain weight” and “want to gain a little weight.” About 30% of boys and about 45% of girls answered “want to lose weight” and “want to lose a little weight” (data not shown). About 35% of children whose obesity indices are in the normal range answered “want to lose weight” and “want to lose a little weight” (data not shown). According to research regarding the weight of girls in elementary school conducted by Maruyama et al.<sup>13)</sup>, many children in fifth and sixth grade start having a vague idea about their weight and body shapes and our research also showed similar results.

Similar to reports by Yakura et al.<sup>14)</sup> and Takeuchi et al.<sup>15)</sup>, our research did not find a significant difference though there were more girls who over-evaluate their body shapes and have a desire to be thin than boys. We believe women have a strong desire to be thin and awareness towards obesity because boys and girls develop physical recognition at different rates and have different values. Kuriwa et al.<sup>16)</sup> reported that girls after age 7 tend to recognize the skinny body shape as the normal body shape as they age. Katayama et al.<sup>9)</sup> reported that physical awareness increases as boys and girls age, with girls having the highest degree of physical awareness in high school, while boys have the highest degree of physical awareness after university. Yakura et al.<sup>1)</sup> reported that the reason why girls in high school have the strongest awareness towards obesity is because high school is an unstable time when their bodies develop completely as adult women physically but their self-development is not complete mentally and they continue looking at how they are viewed by others. Furthermore, Urata et al.<sup>17)</sup> reported that the standard of female beauty reflects the era and women over-evaluate their body shapes as obese in order to respond to the social value of a preference towards skinniness. Consequently, in terms of body shape, it can be considered that girls see value in being “skinny.” On the other hand, Furukawa et al.<sup>18)</sup> reported that boys in junior high school are also affected by the trend to be skinny. It can also be said that boys tend to obsess about being “skinny” as well because our research also found that boys over-evaluated and had a desire to be skinny.

With regard to over-evaluating body shapes, Nishizawa et al.<sup>12)</sup> reported that female university students in the over-evaluated group had significantly low scores in terms of self-esteem and a significantly negative correlation between self-esteem and insecurity about their body shapes was found. In our research, we examined

the assumption that a relationship with the desire to be thin can be found when comparing children in fifth and sixth grade who over-evaluate their body shapes with children who correctly evaluate their body shapes. As a result, items such as “want to be considered skinny,” “do not like to be considered fat,” and “envious of people who are skinny” were significantly high in girls in the over-evaluated group. This shows that for girls in fifth and sixth grade, there is a relationship between perceived body shapes and the desire to be thin.

According to reports by Yakura et al.<sup>1)</sup> and Maruyama et al.<sup>13)</sup>, it can be considered that children in fifth and sixth grade have a desire to be thin but they do not take action.

According to reports by Miyagi<sup>19)</sup>, Takeuchi et al.<sup>15)</sup>, and Shigeta et al.<sup>20)</sup>, it can be considered that distorted perceived body shapes and a strong desire to be thin lead to actions and those actions affect life styles and subjective symptoms.

Maekawa<sup>21)</sup> indicated a relation to social factors as an obsession factor towards weight and body shapes targeting young women, and Maekawa<sup>21)</sup> also reported that not only having experience being “pointed out regarding their body shapes” forms a “value on being thin” but also directly relates to “dissatisfaction of body shapes.” From the comments section in our research in which children were asked to provide reasons for their desired body shapes, we discovered that there are some children whose desired body shapes reflected their parents and friends’ suggestions. Furthermore, Tagawa et al.<sup>6)</sup> reported that methods used by female university students to evaluate their bodies are subjective ones such as “looks” and “weight” and the reason why they over-evaluated their bodies relates strongly to their capability to self-evaluate, with the percentage of people who can self-evaluate objectively by comparing themselves to others declining. Similar to reports provided by Maekawa<sup>21)</sup>, from the comments section in our research in which children were asked to provide reasons for their desired body shapes, we discovered that there are some children whose desired body shapes reflected comparisons with others such as their friends and models. As a result, the factors mentioned above result directly in desired body shapes during puberty when children start recognizing their body shapes.

In addition, the answer “do not like to be considered fat” had a high average score regardless of obesity indices and perceived body shapes. Urata<sup>22)</sup> reported that “being fat” today is said to correspond to “lack of

self-management skills” and a self-controlled skinny figure is desired in this era. Elementary school students are considered to also have this view. Children in fifth and sixth grade are right in the middle of the developing stage and their height and weight will increase as secondary sexual characteristics appear. It is important to accept their own growth and development positively without becoming obsessed with “looks” and “weight.”

As a result of this research, a relationship was found between distorted perceived body shapes and the desire to be thin in children in fifth and sixth grade. In order to prevent children from being obsessed with incorrect dieting and extreme skinniness as they grow and develop, they need to recognize their own body shapes correctly and to do so, they need to understand their own growth and development correctly and accept it positively. Consequently, health education is considered to play a big role and it is important to provide continuous education based on the development stage children are in. As a school nurse, it is important to increase children’s awareness of their own health conditions from an early age in order for children to foster correct perceptions on growth and development, thus leading to a better understanding on the part of children and improved health in the future.

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