

Study on Factors of Body Image in Japanese and Vietnamese Adolescents

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Summary Over-concern about thinness, especially among young girls including adolescents, is common in Japan. Behind the problem, there is a complicated social phenomenon and an effective strategy is not known yet. In this study, we tried to find a clue by comparing body image between two countries which have different social backgrounds. Subjects were Japanese and Vietnamese junior high school students from 12 to 15 y old. Three schools each and 1–2 classes from each grade were randomly selected to involve 374 (boys 196, girls 178) and 714 (boys 352, girls 362), respectively, in Japan and Vietnam. Height and weight of subjects were measured and their satisfaction about their body shape and experience with dieting were asked by a questionnaire. Questions about their body image concerning their desire, liking of the opposite sex, own liking and health were answered by marking silhouettes. About 60% of Japanese thought that obese (silhouette 9) is unhealthy, while about 85% of Vietnamese thought that thinness (silhouette 1) is unhealthy. Most of the Japanese girls overestimated their body weight and were dissatisfied with their body shape and 78.3% wanted to lose weight. About 30% of them experienced weight loss including 2.8% of the low BMI students. Vietnamese girls also had similar tendencies in their desire about their body image as the Japanese but they were less serious. The girls in both countries preferred the thinner body image to the healthy body image and thought that boys liked the thinner body image. Japanese boys were mostly satisfied with their body shape; however, about half (46%) of the Vietnamese boys wanted a bigger and more muscular body image. In conclusion, the biggest problem with body image was the over-concern about thinness of the Japanese girls, which was based on their own misconception. Therefore, as the strategy to correct their body image, education about good health and also information about the boys' favorite body image are recommended.

Key Words body image, thinness, adolescents, Japan, Vietnam

The Japanese annual nation-wide nutrition survey in 2004 (1) showed that the prevalence of obesity defined as Body Mass Index (BMI) kg/m² over 25 was 27.9% and 18.7%, in adult males and females, respectively. While the prevalence of male obesity has been increasing gradually (21.6% in 1994), that of females, especially of young girls, is decreasing (2). The prevalence of underweight (BMI less than 18.5) was 14.8% in 1984,

19.0% in 1994 and 21.4% in 2004 (1–3). Very strong feelings of dislike against obesity may be the contributory factor. The facts that health professionals have emphasized the unhealthy outcomes of obesity and that society equates thinness with beauty and attractiveness in women facilitated the desire for underweight (4).

This trend was not only observed in young adults, but also in adolescents. According to the Statistical Report of School Health (5, 6), the prevalence of adolescent underweight increased as well as that of adolescent overweight in recent decades. Comparing the data of

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12 y-old school children in 1980 and 2000, the prevalence of overweight was 7.48% vs. 11.28% in boys and 7.30% vs. 10.05% in girls, respectively, while the prevalence of underweight was 1.35% vs. 3.53% in boys and 2.38% vs. 4.15% in girls, respectively (5, 6). The recent Annual National Health and Nutrition Survey also reported similar results (7). There are quite a number of studies on body image in young adults; however, there are only a few on adolescents. The adverse effects of the severe dietary restrictions on their present and future health will certainly be more serious in adolescents than in young adults. The methods of education to correct wrong body image in adolescents and university students should be different. Therefore, a strategy to correct over-concern about thinness is very important.

On the other hand in adolescent boys, the percentage of overweight has been increasing little by little. It would be interesting to know whether the boys do not have a desire to lose weight or whether they have it but can not manage it in practice. There is the further question of how strongly the body image of boys affects the girls' desire to lose weight. Therefore, we also studied the body image of adolescent boys.

The main purpose of this study was to find a strategy to correct wrong body image in Japanese adolescents. For this purpose we thought that it would be good to show them that the body image of Japanese adolescents is not the same as for their age group in other countries, which can lead them realize that their body image is only a kind of fashion. We selected Vietnam for the comparison of body image in adolescents, because the social background is quite different and it was easy for us to gain co-operation because of our long collaboration.

METHODS

1. Design and participants. In a cross-sectional survey, male and female junior high school students whose ages ranged from 12 to 15 y in Japan and Vietnam were included. The approval for this study was given by the Ethical Committee of The University of Tokushima in Japan and by the Research and Ethical Review Board of the Nutrition Center of Ho Chi Minh City, in Vietnam.

Japan is geographically divided into 7 regions. One or two public junior high schools were selected randomly from each region. The aim of the study and the fact that the participants' privacy would not be compromised were explained to the principals and teachers of the schools. Finally, only three schools in Kagawa, Tochigi and Toyama prefectures gave their consent to launch the survey. One or 2 classes were selected from each grade and each school. In Vietnam, 3 schools were randomly selected from a list of all public junior high schools in Ho Chi Minh City. A self-reported, anonymous questionnaire was used to measure demographic variables, consciousness and attitude toward current body weight and body image. The questionnaire was translated into Vietnamese with the assistance of native health professionals. By this questionnaire, we con-

firmed that the students, especially, Japanese girls had a strong desire to lose weight.

2. Physical characteristics. To determine actual body size, height and weight were measured to 0.1 cm and 0.1 kg, respectively. The weight was measured with a digital balance. The height scales placed in each school was used. The measurement was performed with light clothes, without shoes and socks and evaluating them within 1 h after a meal or exercise was avoided. BMI was calculated from height and weight measurements as kg/m^2 and subjects were then classified as low BMI group (0–14 percentile), moderate BMI group (15–84 percentile), and high BMI group (85–100 percentile) based on the actual BMI of each group.

3. Body image. Body image of participants was investigated visually by using the Stunkard silhouette chart (Fig. 1) (8, 9). In the chart, there are 9 silhouette from very thin to obese. The validity of this method has been confirmed by researchers (8). Participants were asked to choose the corresponding figures for the eight questions shown below.

Q1 "Which figure do you think resembles yours?" (CURRENT)

Q2 "Which figure would you like be?" (IDEAL)

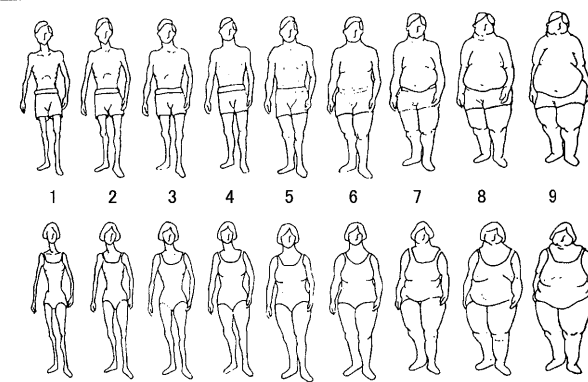
Q3 "Which opposite sexual figure do you think the most attractive?" (OPPOSITE ATTRACTIVE)

In case of boy subjects, the meaning is which female figure do you think the most attractive? (Q3b), and vice versa for the girls' question (Q3g).

Q4 "Please choose one figure of the same sex as you, which figure do you think attracts the opposite sex most?" (OPPOSITE FINDS ATTRACTIVE)

In case of boy subjects, the meaning is which male figure do you think attracts females most? (Q4b), and vice versa for the girls' question (Q4g).

Q5 "Which male figure do you think look most healthy?" (HEALTHY MALE)



BODY IMAGE (Select only one appropriate)

Q1: Which figure do you think resembles to yours?
 Q2: Which figure would you like to be?
 Q3: Which opposite sexual figure do you think the most attractive?
 Q4: Please choose one figure of the same sex as you, which figure do you think attract the opposite sex most?
 Q5: Which male figure do you think look most healthy?
 Q6: Which female figure do you think look most healthy?
 Q7: Which male figure do you think look least healthy?
 Q8: Which female figure do you think look least healthy?

Fig. 1. Body image questionnaire.

Table 1. Physical characteristics.

	Boy			Girl		
	Japanese (n=196)	Vietnamese (n=352)	<i>p</i> value*	Japanese (n=178)	Vietnamese (n=362)	<i>p</i> value*
Height (cm)						
Total	162.5±7.96	156.9±9.34	<0.0001	155.5±5.59	152.4±5.95	<0.0001
Low BMI group	158.0±8.19	151.6±9.46		153.6±5.50	149.5±6.21	
Moderate BMI group	162.3±7.75	157.2±9.16		155.4±5.67	152.6±5.81	
High BMI group	167.5±5.77	160.5±8.07		157.1±4.98	153.8±5.58	
Weight (kg)						
Total	54.8±13.66	48.0±12.32	<0.0001	51.2±10.92	43.4±8.10	<0.0001
Low BMI group	41.8±5.31	34.3±5.13		40.1±3.93	32.7±3.44	
Moderate BMI group	52.7±6.96	46.6±8.22		49.4±5.21	42.8±5.07	
High BMI group	78.1±16.57	67.1±10.43		68.0±13.71	55.9±6.32	
BMI (kg/m ²)						
Total	20.6±3.94	19.3±3.68	<0.0001	21.1±3.99	18.6±2.92	<0.0001
Low BMI group	16.7±0.80	14.8±0.68		17.0±0.80	14.6±0.74	
Moderate BMI group	19.9±1.51	18.7±1.99		20.4±1.66	18.3±1.59	
High BMI group	27.7±5.04	25.9±2.36		27.5±5.06	23.6±1.96	

mean±SD. * *t*-test (significant national difference; Japanese vs. Vietnamese).

Q6 "Which female figure do you think look most healthy?" (HEALTHY FEMALE)

Q7 "Which male figure do you think look least healthy?" (UNHEALTHY MALE)

Q8 "Which female figure do you think look least healthy?" (UNHEALTHY FEMALE)

4. *Data analysis.* The *t*-test was used to determine differences between physical measurement means. The deficit value of the questionnaire was excluded in each question and it was analyzed. The chi-square test was used to determine differences in categorical data. Non-parametric methods, including the Mann-Whitney *U*-test and Krasukal-Wallis test were used for the comparison of two groups or multigroups' body image scores. The level of significance was set at $p<0.05$. The data were analyzed using SPSS 11.5J for Windows.

RESULTS

1. Subjects

In Japan, of the 387 questionnaires handed out, 378 subjects completed the questionnaires (97.7%), of which 4 subjects were excluded because sexual and physical data missing. The effective answer rate was 98.9%. The number of Japanese boys and girls participating in the study was 196 and 178, respectively. Their mean age was 13.6 ± 0.85 y. In Vietnam, of the 723 questionnaires handed out, 723 subjects completed questionnaires (100%), of which 9 subjects were excluded because of missing sexual and physical data. The effective answer rate was 98.8%. The number of Vietnamese boys and girls was 352 and 362, respectively. Their mean age was 13.0 ± 0.82 y.

Physical characteristics are shown in Table 1. Height, weight and BMI in Japanese were significantly higher than those in Vietnamese in both genders (all $p<0.0001$). In this study, subjects were divided into 3

groups depending upon their BMI distribution. They were low (0–14 percentile), moderate (15–84 percentile) and high (85–100 percentile) BMI groups. However, the cut-off points of BMI in these 3 groups were not same in the Japanese and Vietnamese subjects. Since the purpose of this study was to determine body image in all of the subjects, we thought that the difference in cut-off points of the 3 BMI groups in Japan and Vietnam was acceptable in this study.

2. Body image

Table 2 summarizes the consciousness and attitude toward the current body weight of the students and shows that the Japanese subjects, especially girls, had a strong desire to lose weight.

Japanese boys and girls perceived themselves as overweight more than Vietnamese boys and girls (both $p<0.0001$). Furthermore, Japanese girls described themselves as overweight more than Japanese boys ($p<0.0001$). However, there was no significant gender difference in Vietnamese ($p=0.332$).

About 65% of Japanese boys, Vietnamese boys and girls correctly identified their body weight. 58.6% of Japanese girls overestimated their body weights, which was higher than for the other groups ($p<0.0001$). Both Japanese boys and girls significantly overestimated their body weights compared with Vietnamese boys and girls, (both $p<0.0001$). The gender difference was only significant among Japanese ($p<0.0001$). Besides, 70.8% of Japanese girls overestimated even though their body size was low BMI or moderate BMI (data not shown).

About 45% of Vietnamese boys and girls and Japanese boys were satisfied with their current body weight. Over 80% of Japanese girls had dissatisfaction with their current body weight, which is higher than for the other three groups ($p<0.0001$).

Japanese students intended to lose weight, while Viet-

Table 2. Consciousness and attitude toward own current body weight.

	Boy		Girl		<i>p</i> value ^{*,†,‡}
	Japanese (<i>n</i> =196) % (no.)	Vietnamese (<i>n</i> =352) % (no.)	Japanese (<i>n</i> =178) % (no.)	Vietnamese (<i>n</i> =362) % (no.)	
Actual body size					
Low BMI group	14.8 (29)	13.9 (49)	14.0 (25)	13.5 (49)	
Moderate BMI group	70.4 (138)	70.7 (249)	69.1 (123)	71.3 (258)	
High BMI group	14.8 (29)	15.3 (54)	16.9 (30)	15.2 (55)	
Perceived body weight					
Thin	15.4 (30)	33.5 (116)	1.1 (2)	33.6 (117)	
Normal	52.2 (102)	48.3 (167)	33.4 (58)	44.0 (153)	<0.0001 ^{a,b,c}
Overweight	32.3 (63)	18.2 (63)	65.5 (114)	22.4 (78)	
Discrepancy in weight (actual body size vs. perceived body weight)					
Underestimated ¹	8.7 (17)	25.4 (88)	0.6 (1)	22.7 (79)	
Correct ²	66.7 (130)	65.3 (226)	40.8 (71)	67.0 (233)	<0.0001 ^{a,b,c}
Overestimated ³	24.6 (48)	9.2 (32)	58.6 (102)	10.3 (36)	
Satisfaction					
Satisfied with actual body weight	48.7 (93)	45.2 (159)	16.7 (29)	42.5 (154)	<0.0001 ^{b,c}
Unsatisfied with actual body weight	51.3 (98)	54.8 (193)	83.3 (145)	57.5 (208)	
Desire for weight change					
Lose	36.1 (69)	25.3 (89)	78.3 (137)	34.3 (124)	
Remain the same	50.8 (97)	29.0 (102)	21.1 (37)	27.1 (98)	<0.0001 ^{a,b,c,d}
Gain	13.1 (25)	45.7 (161)	0.6 (1)	38.7 (140)	
Weight-loss experience					
Yes	3.6 (7)	15.9 (56)	27.0 (48)	15.2 (55)	<0.0001 ^{a,b,c}
No	96.4 (185)	84.1 (296)	73.0 (130)	84.8 (307)	

* Chi-square test (significant 4 groups differences; Japanese boy vs. Vietnamese boy vs. Japanese girl vs. Vietnamese girl).

† Chi-square test, $p < 0.05$ (significant national differences; ^a Japanese boy vs. Vietnamese boy, ^b Japanese girl vs. Vietnamese girl). [‡] Chi-square test, $p < 0.05$ (significant gender differences; ^c Japanese boy vs. Japanese girl, ^d Vietnamese boy vs. Vietnamese girl). ¹ Actual > Perceived (The adolescents were bigger than they thought). ² Actual = Perceived. ³ Actual < Perceived (The adolescents were thinner than they thought).

Table 3. Number of subjects who answered silhouettes No. 1 or No. 9 was unhealthy.

	Boy		Girl		<i>p</i> value ^{*,†,‡}
	Japanese (<i>n</i> =196) % (no.)	Vietnamese (<i>n</i> =352) % (no.)	Japanese (<i>n</i> =178) % (no.)	Vietnamese (<i>n</i> =362) % (no.)	
Male's silhouette					
Silhouette no. 1 (the thinnest)	35.4 (69)	87.6 (254)	40.7 (72)	85.1 (269)	
Silhouette no. 9 (the biggest)	59.0 (115)	10.3 (30)	58.8 (104)	11.7 (37)	<0.0001 ^{a,b}
Female's silhouette					
Silhouette no. 1 (the thinnest)	39.3 (75)	86.5 (249)	42.1 (75)	84.8 (268)	
Silhouette no. 9 (the biggest)	57.1 (109)	11.1 (32)	57.9 (103)	12.3 (39)	<0.0001 ^{a,b}

* Chi-square test (significant 4 groups differences; Japanese boy vs. Vietnamese boy vs. Japanese girl vs. Vietnamese girl).

† Chi-square test, $p < 0.05$ (significant national differences; ^a Japanese boy vs. Vietnamese boy, ^b Japanese girl vs. Vietnamese girl). [‡] Chi-square test, $p < 0.05$ (significant gender differences; ^c Japanese boy vs. Japanese girl, ^d Vietnamese boy vs. Vietnamese girl).

name were likely to gain weight. There were national difference between Japan and Vietnam for both boys and girls ($p < 0.0001$). Japanese girls had a significantly stronger desire for weight loss than Japanese boys did ($p < 0.0001$). Vietnamese boys had significantly stronger desire for gaining weight than Vietnamese girls did ($p = 0.028$).

Many Japanese girls (27.0%) had weight-loss experience, which was significantly higher than for the other three groups, despite their actual body size being low BMI or moderate BMI (23.6%). About 15% of Vietnamese boys and girls had weight-loss experience. The gender difference was only observed in Japanese subjects ($p < 0.0001$).

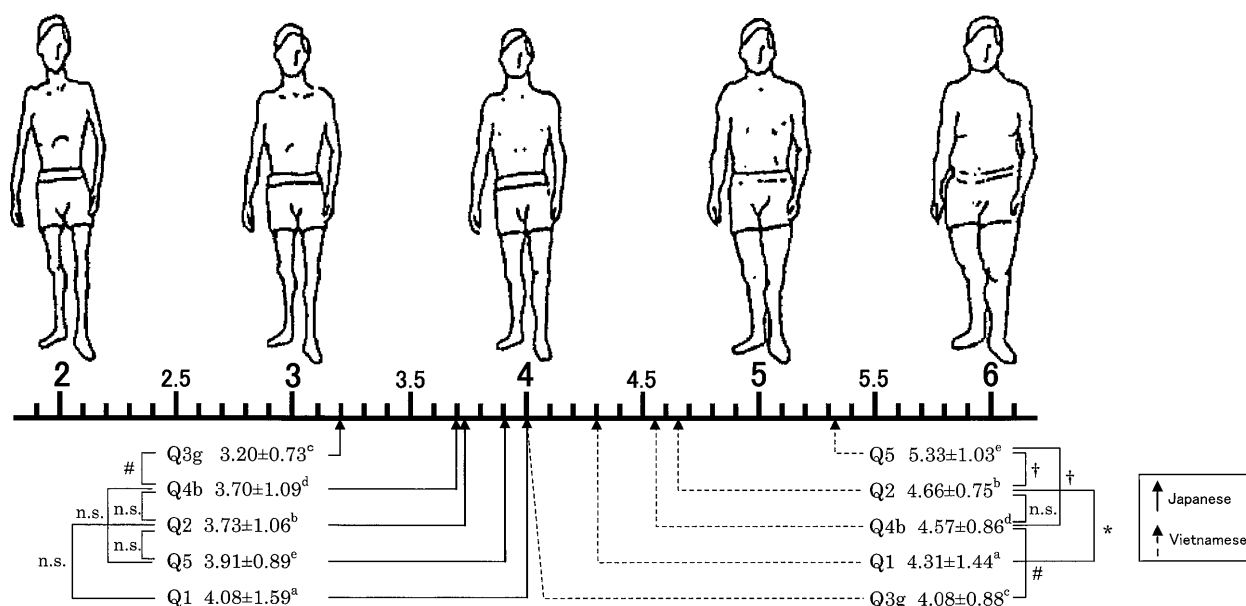


Fig. 2. Body image score (boy). Q1 CURRENT, Q2 IDEAL, Q3g OPPOSITE ATTRACTIVE, Q4b OPPOSITE FINDS ATTRACTIVE, Q5 HEALTHY MALE. ^{a,b,c,d,e} Mann-Whitney *U*-test, $p < 0.05$ (significant national differences; Japanese boy vs. Vietnamese boy, respectively body image score). * Mann-Whitney *U*-test, $p < 0.05$ (significant between-group difference, Q1 vs. Q2). † Kruskal-Wallis test, $p < 0.05$ (significant between-multigroups difference, Q2 vs. Q4b, Q2 vs. Q5, Q4b vs. Q5). # Mann-Whitney *U*-test, $p < 0.05$ (significant between-group difference, Q3g vs. Q4b).

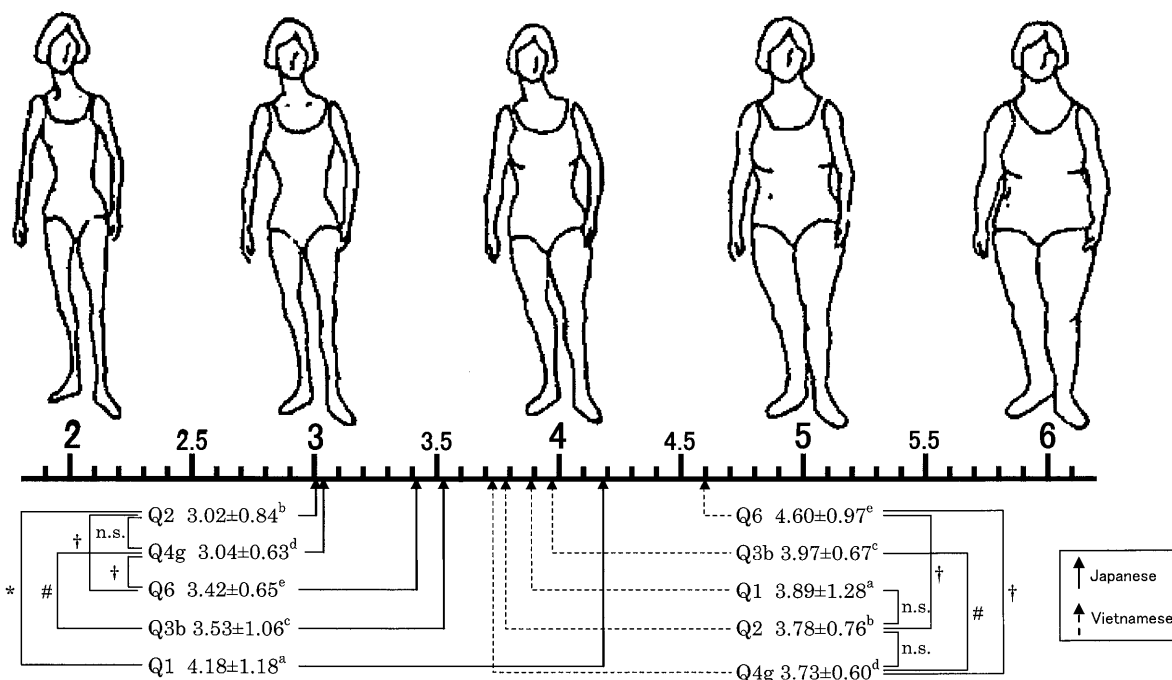


Fig. 3. Body image score (girl). Q1 CURRENT, Q2 IDEAL, Q3b OPPOSITE ATTRACTIVE, Q4g OPPOSITE FINDS ATTRACTIVE, Q6 HEALTHY FEMALE. ^{a,b,c,d,e} Mann-Whitney *U*-test, $p < 0.05$ (significant national differences; Japanese girl vs. Vietnamese girl, respectively body image score). * Mann-Whitney *U*-test, $p < 0.05$ (significant between-group difference, Q1 vs. Q2). † Kruskal-Wallis test, $p < 0.05$ (significant between-multigroups difference, Q2 vs. Q4g, Q2 vs. Q6, Q4g vs. Q6). # Mann-Whitney *U*-test, $p < 0.05$ (significant between-group difference, Q3b vs. Q4g).

Silhouettes associated with being unhealthy are shown in Table 3. About 60% of Japanese thought that the obese figure (i.e. No. 9) was unhealthy. On the other hand, about 85% of Vietnamese thought that the thin figure (i.e. No. 1) was unhealthy. There was a national difference in their perceptions of unhealthy body size.

Body image scores of boys are shown in Fig. 2. Body image score from Q1 to Q5 in Japanese boys were significantly lower than those in Vietnamese boys. There was no difference between Q1 (CURRENT) and Q2 (IDEAL) in Japanese boys ($p = 0.126$); however, the body image score of Q2 was significantly higher than that of Q1 in

Vietnamese boys ($p < 0.0001$). There were significant differences between Q2 vs. Q5 and Q4b vs. Q5 in Vietnamese (both $p < 0.0001$); however, there was no difference in Japanese. However, comparing the answer of Q4b from boys with the answer Q3g from girls, the body image score of Q4b was higher than that of Q3g for both Japanese and Vietnamese ($p < 0.0001$). That is, girls did not like as big figures as boys thought.

Body image scores of girls are shown in Fig. 3. The body image scores for Q2 to Q6 among Japanese girls were significantly lower than those among Vietnamese girls. The body image score for Q2 (IDEAL) was significantly lower than that for Q1 (CURRENT) in Japanese ($p < 0.0001$); while there was no difference between Q1 and Q2 in Vietnamese ($p = 0.305$). There were significant differences between Q2 vs. Q6 (Japan $p < 0.0001$, Vietnam $p < 0.0001$) and Q4g vs. Q6 (both $p < 0.0001$). However, comparing the answer of Q4g from girls with the answer of Q3b from boys, the body image score for Q4g was lower than that for Q3b (both $p < 0.0001$). That is, boys did not like as thin figures as girls thought.

DISCUSSION

In this study we found some interesting results about the body image among Japanese and Vietnamese adolescents. About 60% of the Japanese subjects thought that the obese silhouette (9) was unhealthy, while about 85% of Vietnamese thought that thinness (silhouette 1) was unhealthy, indicating that depending upon the difference in social background, the concept about health changes. In Japan when the prevalence of obesity was not high and infectious diseases were more common than cardiovascular disease, people thought obese persons were healthier than thin ones. There is no scientific evidence; however, we think that such a concept had been observed until the 1970s. Vietnam is now in a transitional phase and the body image may also undergo a change like Japan has experienced. These means that we can estimate the future direction of body image and it is possible to change the concept about body image.

By reflecting the present concept about health, Japanese young girls have an over-concern with thinness. Most of the Japanese girls overestimated their body weight and were dissatisfied with their body shape (83.3%) and wanted to lose weight (78.3%). About 30% of them experienced weight loss including 2.8% of the low BMI students with BMI < 18.0 . Although Vietnamese girls also had similar tendencies in their desires about their body image as the Japanese girls, they were less serious. This meant that girls in both countries preferred a thinner body image than the healthy body image and they thought that boys liked a thinner body image than the boys actually did. On the other hand, Japanese boys were satisfied with their body shape although their average BMI was not low. The reason why the girls had so serious a concern about thinness as compared with boys, may be because the evaluation of the society for females is often beauty, while that of males is strength.

On the other hand, about half (46%) of the Vietnamese boys wanted a more muscular body image than the girls' favorite body image for them. The desire of Vietnamese boys was closer to that of Western men (10). However, American female college students liked a body image with much less muscular men than the men thought desirable (11). Young Western men like unrealistic body shapes and advertising seems to place an increasing value on the male body. This image is now known as the "Adonis complex." Another serious consequence of male body image concerns is the abuse of anabolic-androgenic steroids and other "body image drugs" (12).

Some limitations of the present study should be taken into account when interpreting the findings. First, for the high reliability of these data, actual physical characteristics were measured. When the surveys were conducted in Japan, we encountered difficulties on getting consent from schools. Even though we explained that subjects' privacy would not be compromised, most of the public schools refused to participate. Therefore, the participant population was rather small in Japan. However, in this study we could confirm that Japanese students had a strong concern about body weight loss.

Second, the silhouette chart was used to examine body image visually. However, it is difficult to interpret whether the students regarded the body size of this silhouette chart as having excess muscle or fat.

Although there are some limitations, our study provided valuable insights into the body image of adolescents in Japan and Vietnam. The national differences observed in our study were likely to be related to culture and provided evidence for establishing different education programs for Japan and Vietnam.

In conclusion, we confirmed that the biggest problem with body image was the over-concern about thinness of the Japanese girls, which was based on their own misconception. Therefore, as a strategy to correct their body image, the following are recommended: 1) education about good health and 2) information about boys' favorite body image, which is not so thin as girls think.

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