

Relationship between body weight perception and weight-related behaviours

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Abstract

Objectives: This study aimed to examine the prevalence of weight misperception and to explore the association of weight perception with physical activity and dietary intake.

Methods: A population-based, nationally representative cross-sectional survey was conducted of 920 Thai adolescents aged 13 to 24 years. Respondents were selected using stratified multi-stage sampling. Respondents who agreed to participate were asked to complete the Youth Risk Behavior Questionnaire.

Results: Females were more likely than males to misperceive themselves as overweight (21.8% vs. 11.7%), whereas males were more likely than females to misperceive themselves as underweight (12.3% vs. 3.4%). Males were more likely than females to report a high intake of vegetables (45.7% vs. 38.0%), milk (39.1% vs. 38.0%), 100% fruit juice (20.9% vs. 17.7%) and soda or pop (38.5% vs. 20.6%). Males were also more likely than females to report vigorous physical activity of more than 60 minutes per day (38.1% vs. 21.3%) and vigorous exercise to strengthen or tone muscles (37.3% vs. 13.2%).

Conclusions: Gender differences in dietary intake and physical activity were identified. However, there were no significant differences in dietary intake and physical activity between adolescents who correctly perceived themselves as overweight and those who misperceived themselves as overweight.

Keywords

Body weight perception, adolescents, physical activity, dietary intake, Thailand, survey

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Introduction

Childhood and adolescent obesity has become one of the most important global health problems. Data from the United States Health and Nutrition Examination Surveys (NHANES) show that the prevalence of adolescent obesity has increased dramatically from 5.0% to 20.6% between the periods 1976–1980 and 2013–2014.¹ Several studies have reported an increasing trend in adolescents being overweight and in the incidence of obesity in Asian and Western countries such as Australia, England, Germany, Iceland, Scotland, Chile and Japan.² In Thailand, the prevalence of this problem among 7th and 12th grade students is 10.6% and 3.5%, respectively.³ Previous studies have reported a wide range of causes of being overweight and obese, such as lack of physical activity and unhealthy dietary behaviours.^{4,5} Psychosocial factors have received increasing attention because of the multifactorial nature of obesity. Of particular interest is that the perception of being overweight and body dissatisfaction are associated with unhealthy weight control behaviours and an increased risk of obesity.^{6,7} The complex relationship between weight status and body image is important because of its influence on adolescent health behaviours. Negative health consequences may result from the unique interaction between weight status and body image. These include physical inactivity, eating disorders and dysfunctional exercise.⁸ Research on how the perception of being overweight relates to weight-related lifestyle behaviours is still controversial. Some studies have found that adolescents who perceive themselves as overweight are more likely to report using exercise as a weight control strategy.⁹ Other studies have shown that perceptions of being overweight are associated with lower physical activity, and some studies have reported no significant relationships between these factors.^{10,11} Similarly, some

studies have found that perceived obesity is more likely to result in healthy dietary intake to lose weight, whereas other studies have shown that perceived obesity is associated with unhealthy eating habits, such as inadequate fruit and vegetable intake. Yet other studies report no significant relationships between weight perception and behaviour.^{9,10,12} The aims of this study were to examine the correlation between weight perception and body mass index (BMI), to examine the prevalence of weight misperception and to explore the relationship between gender, weight perception and weight-related behaviours.

Methods

Study design and participants

The Youth Risk Behavior Survey (YRBS) is a population-based, nationally representative cross-sectional survey that was completed between January and March 2013. Respondents aged 13 to 24 years old were selected for the study using stratified multi-staged sampling. The primary strata consisted of Bangkok and the central, northern, north-eastern and southern regions of Thailand. Two provinces were randomly selected from each of the four regions. Each province was secondarily stratified into urban and rural districts. Households were selected within each cluster using enumeration, followed by a simple random sampling method. A respondent was randomly selected from each household using the 'Kish Grid' method.¹³ Respondents or parents of respondents were asked to provide their written informed consent to participate in the survey. Respondents who agreed to participate were instructed to complete the self-administered questionnaire in a private area to ensure privacy from other family members. Ethics approval was granted by Srinakharinwirot University (approval number SWUEC/EX22/2555).

Questionnaire

The 2011 National YRBS is a self-administered questionnaire that was developed and tested for reliability and validity by the United States Centers for Disease Control and Prevention.¹⁴ The questionnaire was translated into Thai and reviewed by developmental paediatricians and a research team from Mahidol University, Thailand. Pilot testing was conducted to validate the questionnaire for accuracy and appropriateness. The final Thai version contained 75 multiple-choice questions that measured six categories of priority health behaviours. In this study, we used the data from the dietary behaviours and physical activity categories.

Definitions

The following definitions were used in this study: early adolescence, 13 to 14 years; middle adolescence, 15 to 17 years; late adolescence, 18 to 21 years and early adult, 22 to 24 years.

Measures

Body mass index (BMI). BMI is defined as weight in kilograms divided by height in meters squared. BMI was categorized into underweight (<5th percentile for age), normal weight (\geq 5th to <85th percentile for age) and overweight or obese (\geq 85th percentile for age).¹⁵

Body weight perception. Information on weight perception was obtained by asking respondents how they would describe their weight: very underweight, slightly underweight, about the right weight, slightly overweight or very overweight. Respondents who rated themselves as slightly overweight or very overweight were scored as perceiving themselves as overweight. Respondents who rated themselves as very underweight or slightly underweight were scored as perceiving themselves as underweight.

Respondents who rated themselves as about the right weight were scored as perceiving themselves as normal weight. We categorized the respondents into subgroups. The normal or underweight respondents (BMI <85th percentile for age) who misperceived themselves as overweight were labelled 'misperception overweight'. The normal or overweight respondents (BMI \geq 5th percentile for age) who misperceived themselves as underweight were labelled 'misperception underweight'. The overweight or obese respondents (BMI \geq 85th percentile for age) who perceived themselves as overweight were labelled 'correct perception overweight'. The underweight respondents (BMI <5th percentile for age) who perceived themselves as underweight were labelled 'correct perception underweight'.

Weight control behaviours. Respondents reported whether they were currently trying to lose weight. For those who were trying to lose weight, weight control behaviours in the previous 30 days were assessed by three yes or no questions: 1) Did you go without eating for 24 hours or more (also called fasting)? 2) Did you take any pills, powders or liquids without a doctor's advice to lose weight? (Do not include meal replacement products.) 3) Did you vomit or take laxatives to lose weight?

Dietary intake. Respondents were asked how many times during the previous 7 days they had consumed each of the following food items: 100% fruit juice, fruit, vegetables, soda or pop, and milk. The responses were categorized as 'none', 'low intake' (at least once a week but not every day), and 'high intake' (at least once a day).

Physical activity. Respondents were asked how many days during the previous 7 days they had spent time on each of the following activities: physical activity for a total of at least 60 minutes per day and

exercises to strengthen or tone their muscles. The responses were categorized as no activity, moderate activity (1 to 2 days) and vigorous activity (3 days or more). Respondents were asked how many hours they spend on an average school day on each of the following activities: watching television and playing video or computer games. The possible responses were none, less than 1 hour, 1, 2, 3, 4 and 5 hours or more.

Statistical analysis

Descriptive statistics were generated to characterize the samples and to estimate the prevalence of weight perception, physical activity and dietary intake. Correlations between BMI and weight perception were calculated using Spearman’s correlation and weight perception by gender was estimated using odds ratios (OR). Chi-square analysis was used to describe the independence for weight control behaviour, dietary intake and physical activity against gender and weight perception. Statistical analysis was performed using IBM SPSS Statistics, version 23.0 (IBM Corp., Armonk, NY, USA).

Results

Demographic characteristics

Nine hundred and twenty respondents agreed to participate in this survey and

completed the questionnaire. The mean age of the respondents was 18.64 (standard deviation = 3.17) years. Most respondents were in the middle adolescent age group (33.9%), followed by the late adolescent (33.6%), early adult (24.6%), and early adolescent age groups (7.9%), and 97% of respondents were Buddhist. Most respondents came from the northeast region (32.2%), followed by the central region (22.1%), northern region (17.3%), southern region (16.7%) and Bangkok (11.7%). The prevalence of overweight was higher in males than in females (17.8% vs. 11.5%). More females than males perceived themselves as overweight (32.8% vs. 25.4%).

Weight perception by gender

Table 1 shows the significant correlations between body image perception and BMI in both females (Spearman correlation = 0.599, *P* value < 0.001) and males (Spearman correlation = 0.506, *P* value < 0.001). Table 2 shows that the proportion of respondents who misperceived themselves as overweight was significantly higher in females than in males (21.8% vs. 11.7%, OR = 2.45, 95% confidence intervals [CI] = 1.64–3.65). Contrarily, the proportion of respondents who misperceived themselves as underweight was significantly higher in males than in females (12.3% vs. 3.4%, OR = 0.22, 95% CI = 0.12–0.41).

Table 1. Correlation between body image and body mass index.

Body mass index	Weight perception					
	Females (Spearman correlation = 0.599, <i>P</i> < 0.001)			Males (Spearman correlation = 0.506, <i>P</i> < 0.001)		
	Underweight	Normal weight	Overweight	Underweight	Normal weight	Overweight
Underweight	61 (81.3)	68 (34.2)	9 (6.7)	65 (50.8)	61 (24.0)	8 (6.2)
Normal weight	13 (17.3)	130 (65.3)	80 (59.7)	58 (45.3)	177 (69.7)	52 (40.0)
Overweight	1 (1.3)	1 (0.5)	45 (33.6)	5 (3.9)	16 (6.3)	70 (53.9)

Data are presented as n (%).

Table 2. Weight perception by gender.

Weight perception	Females n = 408	Males n = 512	OR*	95% CI*
Misperception overweight	89 (21.8)	60 (11.7)	2.45	1.64–3.65
Misperception underweight	14 (3.4)	63 (12.3)	0.22	0.12–0.41
Correct perception overweight	45 (11.0)	70 (13.7)	0.74	0.48–1.13
Correct perception underweight	61 (15.0)	65 (12.7)	1.22	0.81–1.84

Data are presented as n (%). *reference group = male. CI: confidence interval; OR: odds ratio.

Table 3. Weight control behaviours by weight perception.

Weight control behaviours	Females		P value	Males		P value
	Correct perception overweight n = 45	Misperception overweight n = 89		Correct perception overweight n = 70	Misperception overweight n = 60	
Trying to lose weight	40 (88.9)	62 (69.7)	0.014	50 (71.4)	44 (73.3)	0.809
Dieted for >24 hours	14 (31.1)	17 (19.1)	0.119	13 (18.6)	10 (16.7)	0.777
Used diet pills	9 (20.0)	18 (20.2)	0.976	3 (4.3)	6 (10.0)	0.201
Used laxatives or vomiting to lose weight	3 (6.7)	12 (13.5)	0.237	1 (1.4)	10 (16.7)	0.002

Data are presented as n (%).

Weight control behaviours by weight perception

Table 3 shows that females who correctly perceived themselves as overweight were more likely to try to lose weight than females who misperceived themselves as overweight (88.9% vs. 69.7%, $P = 0.014$). However, there were no significant differences in weight reduction behaviours between females with the correct perception and those with the misperception of being overweight. Approximately 70% of males (both individuals with the correct perception and those with the misperception of being overweight) had tried to lose weight. Males who misperceived themselves as overweight were more likely to use laxatives or vomiting to lose weight than those who correctly

perceived themselves as overweight (16.7% vs. 1.4%, $P = 0.002$).

Dietary intake and physical activity by gender

Table 4 shows the significant gender differences in dietary intake and physical activity. Males were more likely than females to report a high intake of vegetables (45.7% vs. 38.0%; $P = 0.004$), milk (39.1% vs. 38.0%; $P = 0.001$), 100% fruit juice (20.9% vs. 17.7%; $P = 0.042$) and soda or pop (38.5% vs. 20.6%; $P < 0.001$). Males were also more likely than females to report vigorous physical activity of at least 60 minutes per day (38.1% vs. 21.3%; $P < 0.001$) and vigorous exercise to strengthen or tone muscles (37.3% vs. 13.2%; $P < 0.001$).

Table 4. Dietary intake and physical activity by gender.

Dietary intake and physical activity	Gender		P value
	Females n = 408	Males n = 512	
100% fruit juice			0.042
None	134 (32.8)	194 (37.9)	
Low intake (at least 1 time/week)	202 (49.5)	211 (41.2)	
High intake (at least 1 time/day)	72 (17.7)	107 (20.9)	
Fruit			0.006
None	36 (8.8)	80 (15.6)	
Low intake (at least 1 time/week)	225 (55.2)	248 (48.4)	
High intake (at least 1 time/day)	147 (36.0)	184 (35.9)	
Vegetables			0.004
None	45 (11.0)	73 (14.3)	
Low intake (at least 1 time/week)	208 (51.0)	205 (40.0)	
High intake (at least 1 time/day)	155 (38.0)	234 (45.7)	
Soda or pop			<0.001
None	100 (24.5)	101 (19.7)	
Low intake (at least 1 time/week)	224 (54.9)	214 (41.8)	
High intake (at least 1 time/day)	84 (20.6)	197 (38.5)	
Milk			0.001
None	60 (14.7)	121 (23.6)	
Low intake (at least 1 time/week)	193 (47.3)	191 (37.3)	
High intake (at least 1 time/day)	155 (38.0)	200 (39.1)	
Physical activity for a total of at least 60 min/day			<0.001
No activity	183 (44.9)	191 (37.3)	
Moderate activity (1–2 days)	138 (33.8)	126 (24.6)	
Vigorous activity (≥ 3 days)	87 (21.3)	195 (38.1)	
Exercise to strengthen or tone muscles			<0.001
No activity	227 (55.6)	190 (37.1)	
Moderate activity (1–2 days)	127 (31.1)	131 (25.6)	
Vigorous activity (≥ 3 days)	54 (13.2)	191 (37.3)	
Watches television on school day			<0.001
None	10 (2.5)	31 (6.1)	
Less than 1 hour per day	24 (5.9)	71 (13.9)	
1 hour	25 (6.1)	32 (6.3)	
2 hours	50 (12.3)	86 (16.8)	
3 hours	77 (18.9)	89 (17.4)	
4 hours	91 (22.3)	108 (21.1)	
5 hours or more	131 (32.1)	95 (18.6)	
Uses a computer for non-school work			0.123
None	92 (22.6)	125 (24.4)	
Less than 1 hour per day	51 (12.5)	78 (15.2)	
1 hour	45 (11.0)	49 (9.6)	
2 hours	62 (15.2)	70 (13.7)	
3 hours	50 (12.3)	50 (9.8)	
4 hours	31 (7.6)	62 (12.1)	
5 hours or more	77 (18.9)	78 (15.2)	

Data are presented as n (%).

However, more females than males watched television for 5 hours or more per day (32.1% vs. 18.6%; $P < 0.001$).

Dietary intake and physical activity by gender and weight perception

Table 5 shows the relationship between weight perception, dietary intake and physical activity. Regarding dietary intake, females who misperceived themselves as overweight reported a higher intake of vegetables (43.8% vs. 37.8%), 100% fruit juice (22.5% vs. 15.6%), and soda or pop (17.9% vs. 11.1%) than those who correctly perceived themselves as overweight. Males who misperceived themselves as overweight reported a higher intake of fruit (40.0% vs. 35.7%), 100% fruit juice (25.0% vs. 15.7%) and soda or pop (40.0% vs. 31.4%) than males who correctly perceived themselves as overweight. However, there was no significant difference in dietary intake between adolescents with the correct perception and those with the misperception of being overweight.

Regarding physical activity, females who correctly perceived themselves as overweight reported more vigorous physical activity than females who misperceived themselves as overweight (28.9% vs. 20.2%). Males who misperceived themselves as overweight reported more vigorous exercises to strengthen or tone muscles than those who correctly perceived themselves as overweight (36.7% vs. 24.3%). However, there was no significant difference in physical activity between adolescents with the correct perception and those with the misperception of being overweight.

Discussion

Our findings indicate that 15% of Thai adolescents are overweight or obese and the prevalence is higher in males than in females. Compared with other Asian

countries, the prevalence of being overweight or obese among Thai adolescents was higher than in Chinese adolescents (10.9%), but lower than in Malaysian adolescents (34%).^{11,16} Compared with Western countries, the prevalence of being overweight or obese among adolescents in Thailand was higher than that of adolescents in the Netherlands (7.8%), Switzerland (8.9%), Germany (11.4%), France (11.6%), Norway (12.5%) and Austria. (12.8%). However, the prevalence was lower than reported in studies from Italy (17.4%), England (18.4%), Spain (18.8%), Canada (19.3%) and the United States (25.1%).⁴

Previous studies have identified a discrepancy between perceived weight status and actual weight status, a phenomenon known as weight misperception.^{11,16,17} This study demonstrated that most adolescents had accurate perceptions about their body weight. However, females were more likely to misperceive themselves as overweight, whereas males were more likely to misperceive themselves as underweight. A subcohort study of 2,179 healthy Chinese adolescents found that boys were more likely to perceive themselves as underweight, whereas girls were more likely to perceive themselves as overweight.¹¹ In a Malaysian study, most underweight, normal weight and overweight adolescents perceived their body weight status correctly according to their BMI. However, 20% of females and 9% of males with a normal BMI perceived themselves as overweight. Approximately half the males reported preferring a larger body size whereas 58.3% of females preferred a smaller body size.¹⁶ A study of Brazilian adolescents reported body image distortion in all BMI percentile classes; 35% of underweight adolescents did not regard themselves as thin, and 39.1% of overweight adolescents and 62.1% of obese adolescents did not correctly categorize their weight.¹⁷ Body weight misperceptions have been consistently demonstrated in

Table 5. Dietary intake and physical activity by gender and weight perception.

	Females n = 134			Males n = 130			P value
	Overall n = 134	Correct perception overweight n = 45	Misperception overweight n = 89	Overall n = 130	Correct perception overweight n = 70	Misperception overweight n = 60	
Dietary intake and physical activity							P value
100% fruit juice							0.202
None	42 (31.3)	15 (33.3)	27 (30.3)	51 (39.2)	32 (45.7)	19 (31.7)	
Low intake (at least 1 time/week)	65 (48.5)	23 (51.1)	42 (47.2)	53 (40.8)	27 (38.6)	26 (43.3)	
High intake (at least 1 time/day)	27 (20.2)	7 (15.6)	20 (22.5)	26 (20.0)	11 (15.7)	15 (25.0)	
Fruit							0.876
None	10 (7.5)	1 (2.2)	9 (10.1)	23 (17.7)	13 (18.6)	10 (16.7)	
Low intake (at least 1 time/week)	67 (50.0)	23 (51.1)	44 (49.4)	58 (44.6)	32 (45.7)	26 (43.3)	
High intake (at least 1 time/day)	57 (42.5)	21 (46.7)	36 (40.5)	49 (37.7)	25 (35.7)	24 (40.0)	
Vegetables							0.685
None	15 (11.2)	6 (13.3)	9 (10.1)	20 (15.4)	9 (12.9)	11 (18.3)	
Low intake (at least 1 time/week)	63 (47.0)	22 (48.9)	41 (46.1)	51 (39.2)	28 (40.0)	23 (38.3)	
High intake (at least 1 time/day)	56 (41.8)	17 (37.8)	39 (43.8)	59 (45.4)	33 (47.1)	26 (43.3)	
Soda or pop							0.553
None	32 (23.9)	9 (20.0)	23 (25.8)	33 (25.4)	18 (25.7)	15 (25.0)	
Low intake (at least 1 time/week)	81 (60.5)	31 (68.9)	50 (56.2)	51 (39.2)	30 (42.9)	21 (35.0)	
High intake (at least 1 time/day)	21 (15.7)	5 (11.1)	16 (17.9)	46 (35.4)	22 (31.4)	24 (40.0)	
Milk							0.856
None	22 (16.4)	8 (17.8)	14 (15.7)	40 (30.8)	23 (32.9)	17 (28.3)	
Low intake (at least 1 time/week)	67 (50.0)	22 (48.9)	45 (50.6)	46 (35.4)	24 (34.3)	22 (36.7)	
High intake (at least 1 time/day)	45 (33.6)	15 (33.3)	30 (33.7)	44 (33.9)	23 (32.9)	21 (35.0)	
Physical activity for a total of at least 60 min/day							0.740
No activity	52 (38.8)	18 (40.0)	34 (38.2)	49 (37.7)	27 (38.6)	22 (36.7)	
Moderate activity (1–2 days)	51 (38.1)	14 (31.1)	37 (41.6)	39 (30.0)	21 (30.0)	18 (30.0)	
Vigorous activity (3 days or more)	31 (23.1)	13 (28.9)	18 (20.2)	42 (32.3)	22 (31.4)	20 (33.3)	
Exercise to strengthen or tone muscles							0.159
No activity	76 (56.7)	25 (55.6)	51 (57.3)	56(43.1)	36 (51.4)	20 (33.3)	

(continued)

Table 5. Continued

	Females n = 134			Males n = 130				
	Overall n = 134	Correct perception overweight n = 45	Misperception overweight n = 89	P value	Overall n = 130	Correct perception overweight n = 70	Misperception overweight n = 60	P value
Dietary intake and physical activity								
Moderate activity (1-2 days)	42 (31.3)	15 (33.3)	27 (30.3)		35(26.9)	17 (24.3)	18 (30.0)	
Vigorous activity (3 days or more)	16 (11.9)	5 (11.1)	11 (12.4)		39 (30.0)	17 (24.3)	22 (36.7)	
Watches television on school day				0.977				0.351
None	5 (3.7)	1 (2.2)	4 (4.5)		12(9.2)	6 (8.6)	6 (10.0)	
Less than 1 hour per day	5 (3.7)	2 (4.4)	3 (3.4)		15(11.5)	9 (12.9)	6 (10.0)	
1 hour	10 (7.5)	4 (8.9)	6 (6.7)		7(5.4)	2 (2.9)	5 (8.3)	
2 hours	13 (9.7)	5 (11.1)	8 (9.0)		21(16.2)	14 (20.0)	7 (11.7)	
3 hours	25 (18.7)	7 (15.6)	18 (20.2)		17(13.1)	6 (8.6)	11 (18.3)	
4 hours	27 (20.2)	9 (20.0)	18 (20.2)		29(22.3)	15 (21.4)	14 (23.3)	
5 hours or more	49 (36.6)	17 (37.8)	32 (36.0)		29 (22.3)	18 (25.7)	11 (18.3)	
Uses a computer for non-school work				0.122				0.904
None	35 (26.1)	10 (22.2)	25 (28.1)		29(22.3)	17 (24.3)	12 (20.0)	
Less than 1 hour per day	19 (14.2)	4 (8.9)	15 (16.9)		18(13.9)	10 (14.3)	8 (13.3)	
1 hour	12 (9.0)	4 (8.9)	8 (9.0)		10(7.7)	5 (7.1)	5 (8.3)	
2 hours	19 (14.2)	12 (26.7)	7 (7.9)		14(10.8)	8 (11.4)	6 (10.0)	
3 hours	11 (8.2)	4 (8.9)	7 (7.9)		14(10.8)	6 (8.6)	8 (13.3)	
4 hours	10 (7.5)	2 (4.4)	8 (9.0)		22(16.9)	10 (14.3)	12 (20.0)	
5 hours or more	28 (20.9)	9 (20.0)	19 (21.4)		23(17.7)	14 (20.0)	9 (15.0)	

Data are presented as n (%).

adults as well as in adolescents. In a nationally representative sample of Australian adults, males significantly underestimated their weight status compared with females, whereas females significantly overestimated their weight status compared with males.¹⁸

One systematic review showed that sociocultural beliefs begin to influence body dissatisfaction during the preschool years.¹⁹ Parental influence is the most important factor in the development of preschool children's attitudes to their body image.²⁰ Peer pressure becomes more influential in mid to later childhood when children spend more time at school.²¹ Zhang et al. examined the correlation between actual weight status and weight perception among high school students from five cities: Hong Kong, Macau, Taipei, New York and Los Angeles. The results showed that girls in Chinese cities who actually were overweight were less likely to misclassify themselves as not being overweight than girls in US cities. All the overweight girls from Hong Kong, Macau and Taipei perceived themselves as overweight whereas approximately 70% of girls from New York and Los Angeles did.²²

In the present study, approximately 70% of adolescents who misperceived themselves as overweight tried to lose weight. There was no significant difference in weight control behaviours between female adolescents who correctly perceived themselves as overweight and those who misperceived themselves as overweight. It is a concern that males who misperceived themselves as overweight were more likely to use laxatives or vomiting to lose weight than males who correctly perceived themselves as overweight. Previous studies have identified a relationship between weight perception and weight control behaviours among adolescents and adults. The US National Health and Nutrition Examination Survey 2007–2012 found that adults who reported low energy intake were significantly more

likely to consider themselves overweight, show a desire to weigh less and have tried to lose weight within the previous 12 months.²³ A cross-sectional study of American adults found that women were more likely than men to consider themselves overweight across each BMI category, and were more likely to report attempts to lose weight.²⁴ Research also shows that misperceptions of weight as normal or underweight in overweight adolescents are associated with weight control behaviours. Misperception about weight in overweight or obese high school students is a positive predictor of lower use of fasting, diet pills, laxatives or vomiting to lose weight among females and predicts a lower use of fasting to control weight among males.²⁵ A cross-sectional survey of undergraduate students from 21 countries that used multivariate logistic regression analysis demonstrated an association between the underestimation of being overweight or obese and no attempt to lose weight or not dieting to lose weight.²⁶

The present study demonstrated significant differences in dietary intake and physical activity between females and males. Males were more likely than females to report a high intake of many kinds of food (such as vegetables, milk, 100% fruit juice and soda or pop). Males were also more likely than females to report participation in vigorous physical activity and strength exercises. A possible explanation for this finding relates to gender norms. Males were more likely to participate in sport activity and were less concerned about their body weight than were females. This finding has been confirmed by previous studies conducted in Western countries. A study in Sweden found that dietary intake and leisure time activities were significantly different between genders. Boys exhibited a significantly higher intake of soda, concentrated fruit juice and milk (3% fat) whereas girls reported a

significantly greater intake of fruit and vegetables. Boys spent more time on regular, moderate or vigorous physical activity, being outdoors, and screen time. The largest difference between the genders was for time spent on computer games.²⁷

The evidence for how weight perception relates to weight-related lifestyle behaviour is mixed. Some studies have shown that adolescents who perceive themselves as overweight are more likely to report using exercise or dieting as weight control strategies than those who do not perceive themselves as overweight. Other studies have shown that the perception of being overweight is associated with lower physical activity or unhealthy food consumption, and some have found no relationship. A cross-sectional study in Brazil reported an association between body weight perception and dietary intake and physical activity among high school students. Males who perceived themselves as above the expected weight were twice as likely to exercise and females who perceived themselves as above their expected weight were three times more likely to eat less or avoid eating fatty foods and twice as likely to perform physical exercise to lose weight.²⁸ A previous study on the association between body weight perception and adherence to the recommended amount of physical activity reported that Canadian adolescents who perceived themselves as overweight or obese were less likely to adhere to the physical activity recommendations than those who perceived themselves as at their desired weight.²⁹ Three longitudinal studies found that overweight or obese adolescents and young adults who perceived their weight status as normal gained less weight over time than those who accurately reported themselves to be overweight.³⁰⁻³² This evidence suggests that the perception of being overweight may not be associated with better weight management practices in the long term. The present findings show no

significant relationship between weight perception and weight-related lifestyle behaviours. There were no significant differences in dietary intake and physical activity between adolescents who correctly perceived themselves as overweight and those who misperceived themselves as overweight.

This study has some limitations. First, the dietary intake and physical activity data were based on self-reports and the information might have been affected by recall bias and social desirability. It is possible that certain data were under- or over-reported. Second, there were significant differences in weight-related behaviours between genders. However, we did not find a significant relationship between weight perception and weight-related behaviours. This may be because of the cross-sectional study design and the small sample size in the correct perception and misperception groups. A longitudinal study should be conducted to measure the impact of weight perception on dietary intake and physical activity.

Conclusions

Females were more likely to misperceive themselves as overweight. Conversely, males were more likely to misperceive themselves as underweight. Differences in dietary intake and physical activity between genders were identified. However, there were no significant differences in dietary intake and physical activity between adolescents with the correct perception and those with the misperception of being overweight.

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