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## Research Article

# Overweight Adolescents' Self-Perceived Weight and Weight Control Behaviour: HBSC Study in Finland 1994–2010

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*Introduction.* Overweight and perception of being overweight, may lead adolescent to lose weight. The aim of the present study was to investigate overweight adolescents' self-perceived weight, body dissatisfaction, and weight control behaviour during 1994–2010 in Finland. *Methods.* The country-representative, cross-sectional data of 15-year olds were obtained from the Health Behaviour in School-aged Children (HBSC) study, conducted in 1994 ( $N = 1194$ ; males: 48%), 1998 ( $N = 1545$ ; 49%), 2002 ( $N = 1745$ ; 50%), 2006 ( $N = 1670$ ; 47%), and 2010 ( $N = 2082$ ; 48%). *Results.* The majority of overweight boys (62–69%) and girls (89–100%) assessed themselves as too fat, and their body image was lower than in nonoverweight adolescents. The highest prevalence of current weight controlling was found in 2006 in males (18%) and in 2010 in females (39%). *Conclusion.* The phenomena were current and gender differences notable, but there was no statistically significant difference in overweight adolescents' self-perceived weight, body dissatisfaction, or weight control behaviour between survey years.

## 1. Introduction

The proportion of overweight and obese adolescents has increased in the Western world and the trend is predicted to continue [1]. Finland is no exception, and depending on the definitions used, approximately 10 to 20% of Finnish adolescents are considered overweight or obese [2]. In a comparative study of 41 countries, the overweight and obesity prevalence in Finnish 15-year-old adolescents was a bit higher than the average of 17% in boys and 10% in girls [3]. Slightly higher percentages than average were also obtained in the proportion of adolescents regarding themselves as a bit or much too fat (males: 22% in Finland versus 21% on average; females: 45% versus 41%). The proportions can be assumed to be even higher among the subgroup of overweight young people, who have been shown to be less content with their bodies than adolescents of normal weight [2, 4, 5].

Likely due to increased levels of obesity and the great value placed on a thin appearance, attempts to lose weight have become more widespread among adolescents [6]. Paradoxically, repeated dieting to lose weight may lead to weight gain via long-term adoption of fasting followed by overeating or decreased breakfast consumption [7]. Extreme

dieting has been associated with eating disorders as well as other negative psychological outcomes, such as lower self-esteem in adolescents [6–9].

The prevalence of adolescents' weight control behaviour increases with higher body mass index [10–12]. It has been stated that overweight adolescents may adopt extreme weight control practices because they are further from their ideal weight or have failed to lose weight by means of modest eating or changes in exercise [13]. Obesity, body dissatisfaction, low self-esteem, a feeling of poor life management, and anxiety in young people are connected with weight-reduction behaviour [7, 14, 15]. Overweight and obese children and adolescents have again lower body satisfaction than their nonoverweight peers [16, 17]. However, the perception of overweight rather than the actual weight appears to be the potent force leading to weight-reduction behaviour [4]. According to some studies, acceptance of body size and shape is common amongst overweight teenagers, although some have attempted to lose weight [18].

Factors that protect susceptible adolescents from adopting unhealthy weight-control practices include positive body image [9]. Body image is a multidimensional construct with attitudinal, perceptual, and behavioural components [19]. It

evolves and changes under biological, psychological, social, and cultural influences [20, 21]. The majority of body image disturbances begin during adolescence, although their occurrence has been reported at younger ages [22]. Negative body image predicts weight control behaviour, which may manifest itself in unhealthy actions, for example, fasting, purging, smoking, extreme diets, or training [6, 23, 24]. Body image problems and weight concerns are related to eating disturbances [24, 25], low self-worth [26–28], depressive moods [29, 30], and suicidal ideation [31].

The increasing rate of overweight and obese adolescents has been a public health concern in Finland, and several actions to tackle this problem have been taken. However, less attention has been paid to overweight adolescents' perceptions of their weight and their attempts and practices to control their weight. The purpose of this study was firstly, to monitor overweight 15-year olds' self-perceived weight from 1994 to 2010 and determine the prevalence of body dissatisfaction and secondly, to survey the prevalence of weight control behaviour (i.e., attempts to lose weight and use of specific weight control practices) in the same group during the 2000s in Finland.

## 2. Materials and Methods

**2.1. The Survey.** The empirical data for the study were obtained from the Finnish data of the Health Behaviour in School-Aged Children (HBSC) study. The HBSC study comprises cross-national research conducted by an international network of research teams in collaboration with the World Health Organization Regional Office for Europe. The overall goal of the HBSC study is to gain new insights into and increasing the understanding of health behaviour, lifestyles, and their context in young people. The scope of the HBSC study covers the measurements of a comprehensive variety of behaviours, ranging from those that are a risk to health to those that promote health. As well as running the monitoring survey, the HBSC study also seeks to influence the development of programmes and policies in order to promote the health of young people at both national and international levels. The survey questions span a range of health indicators and health-related behaviour as well as the life circumstances of young people. The questions provide information on demographic factors; health behaviour including physical activity; eating and dieting; well-being indicators including body mass index and body image [32].

**2.2. Participants.** The cross-sectional data were collected through school-based surveys; anonymous, standard questionnaires were issued to a nationally representative sample of 15-year-olds in Finland between March and May in 1994, 1998, 2002, 2006, 2010. The mean age of respondents has been 15 years and 10 months ( $SD = 4$  months) throughout the sampling years of 1994 to 2010. Standard cluster sampling was followed regionally and conducted in accordance with the structure of the national education system. The primary sampling unit was the school, and the participating class from the school was randomly selected.

TABLE 1: Number of adolescents in the cleaned research data and response rates (%) by gender and survey year.

	1994	1998	2002	2006	2010
	Number of adolescents				
Boys	576	770	870	781	992
Girls	618	775	875	889	1090
Total	1194	1545	1745	1670	2082
	Response rate (%)				
Boys	89	89	87	83	94
Girls	99	99	92	86	97
Total	89	88	88	85	96

The number of the schools involved in the survey was 64 in 1994; 85 in 1998; 100 in 2002; 99 in 2006; and 128 in 2010. The number of pupils in the research data as well as the response rate for each survey year is presented in Table 1. The data cleaning process and data management in detail are presented elsewhere [3, 34].

**2.3. Measures.** In the HBSC survey, heights and weights, as well as other measures, are based on self-reports. The respondents were asked to indicate their weight in kilograms and height in centimeters. Body mass index was calculated by dividing weight in kilograms by the square of height in meters ( $\text{kg}/\text{m}^2$ ) for each respondent. The adolescents' weight statuses were categorised by means of the IOTF age- and gender-specific BMI cut-off points represented by Cole et al. [33]. In the present study, the group of overweight adolescents include obese participants if not otherwise noted. All BMI values under the thresholds for overweight were classified as nonoverweight (i.e., normal and underweight).

Self-reported variables are subject to random error and to systematic reporting bias. However, Strauss [10] reported that over 90% of youth aged 12–16 years were correctly classified as normal-weight or obese based on self-reported heights and weights. More modest results have been obtained in some other studies [35, 36], but the studies by Himes et al. [37] and Haines et al. [38] reported again high correlations between reported and measured BMI in adolescents. To evaluate the reliability of the present survey, the stability of the responses to the questions concerning weigh and height, as well as all measures presented below, was investigated by test-retest correlations. These correlations were based on two similar questionnaires completed within a fortnight by 13- and 15-year-old schoolchildren ( $N = 194$ ) from the provinces of Eastern and Western Finland in 2005 [34]. Almost all the respondents indicated the same weight on both measurements (Intraclass correlations  $ICC = .99$ ; 95% Confidence interval  $CI = .99-.99$ ), whereas the stability in self-reported height was found to be only acceptable ( $ICC = .63$ ; 95%  $CI = .54-.70$ ).

To assess perceived weight, the adolescents were asked whether they perceived their body as “much too thin”; “a bit too thin”; “about the right size”; “a bit too fat”; or “much too fat.” For the clarity of presentation, we combined the replies of the first two options (“much too thin” and “a bit too

TABLE 2: Prevalence (%) of overweight with 95% confidence intervals (CI) in 15-year-old Finnish adolescents by survey year.

	1994	1998	2002	2006	2010
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Boys	<i>n</i> = 550	<i>n</i> = 750	<i>n</i> = 849	<i>n</i> = 748	<i>n</i> = 943
Overweight <sup>1</sup> :	12.6 (9.5–16.3)	13.2 (11.0–15.7)	17.9 (15.9–20.1)	19.9 (16.8–23.5)	17.5 (15.0–20.2)
Preobese <sup>2</sup>	11.3 (8.4–14.9)	11.5 (9.3–14.1)	15.0 (13.0–17.1)	16.4 (13.7–19.6)	14.2 (12.0–16.7)
Obese <sup>3</sup>	1.3 (0.5–3.0)	1.7 (1.0–3.0)	2.9 (1.8–4.6)	3.5 (2.2–5.4)	3.3 (2.3–4.6)
Girls	<i>n</i> = 601	<i>n</i> = 754	<i>n</i> = 860	<i>n</i> = 854	<i>n</i> = 1026
Overweight <sup>1</sup> :	4.3 (2.9–6.3)	8.6 (7.0–10.5)	9.4 (7.5–11.7)	12.4 (10.4–14.8)	11.0 (9.1–13.2)
Preobese <sup>2</sup>	3.5 (2.2–5.5)	7.7 (6.2–9.5)	8.0 (6.4–10.0)	10.8 (8.9–13.0)	8.8 (7.2–10.6)
Obese <sup>3</sup>	0.8 (0.4–2.0)	0.9 (0.4–1.9)	1.4 (0.8–2.4)	1.6 (0.9–2.8)	2.2 (1.4–3.6)

*n* = Number of adolescents who reported their weight and height in the sample.

<sup>1</sup>Criteria for overweight: IOTF [33]. The criteria for overweight include obesity.

<sup>2</sup>Prevalence of adolescents whose BMI exceeded the age and gender specific cut off point for overweight but not for obesity (corresponds to the threshold of 25 kg/m<sup>2</sup> for adult overweight).

<sup>3</sup>Prevalence of adolescents whose BMI exceeded the age and gender specific cut off point for obesity (corresponds to the threshold of 30 kg/m<sup>2</sup> for adult obesity).

thin”), as well as the last two options (“a bit too fat” or “much too fat”), and these joint replies are shown in the findings. The test-retest stability in self-perceived weight were found to be excellent (ICC = .81; 95% CI = .76–.85) [34].

To identify those adolescents who were trying to lose weight at the time of taking part in the survey, respondents were asked to indicate if they were at present on a diet or doing something else to lose weight. Possible responses were “Yes”; “No, but I should lose some weight”; “No, my weight is fine”; and “No, because I need to put on weight.” The additional question, “Have you gone on a diet, changed your eating habits or done something else to control your weight during the last 12 months?” assessed the occurrence and duration of weight control practices. The 12-month period was chosen to cover seasonal variations. Six affirmative answer options for this question were from “Yes, for a few days” to “Yes, for 6 months or more.” Those respondents whose answer was “yes” were then asked to indicate which of the listed practices they used to control their weight during the previous 12 months. Listed weight control practices were exercising; skipping meals; fasting (i.e., going without food for 24 or more hours); eating fewer sweets; eating less fat; drinking fewer soft drinks; eating less (smaller amounts); eating more fruits and/or vegetables; drinking more water; restricting diet to one or more food groups (i.e., eat only fruits and vegetables, liquids only, eat only bread, and water); vomiting; using diet pills or laxatives; smoking more; dieting under the supervision of a professional. The test-retest stability of the responses to weight control practices varied from excellent (skipping meals; fasting; restricting diet; vomiting; smoking more) to poor (eating fewer sweets; drinking fewer soft drinks). The stability of responses in attempts to control weight during the previous 12 months was found to be excellent (ICC = .90; 95% CI = .87–.92) [34].

The Body Image Investment (BIS), presented by Orbach and Mikulincer [39], is a measure of emotional investment in the body. The scale consists of four subscales, each composed of six items. The first subscale, which was included in the Finnish survey in 2006 and 2010, refers to feelings and

attitudes regarding body image and contains six items: (1) I am frustrated with my physical appearance; (2) I am satisfied with my appearance; (3) I hate my body; (4) I feel comfortable with my body; (5) I feel anger toward my body; (6) I like my appearance in spite of its imperfections. The respondents were instructed as follows: here are some statements about one’s feelings of his/her body. There are no right or wrong answers. We would like to know your feelings about your body. Please evaluate how the statements relate to you by checking the degree to which you agree or disagree with each one of statement. Scale scores were obtained by summarising the items (items 1, 3, and 5 were scored in the reverse direction). The scale range was 6–30, the higher score indicating the better body image. The test-retest stability of the responses to the BIS items varied from excellent (item 1: ICC = .77; 95% CI = .70–.82) to acceptable (item 6: ICC = .68; 95% CI = .59–.75) [34].

**2.4. Statistical Analysis.** The prevalence estimates for data points 1994, 1998, 2002, 2006, and 2010 are presented separately for each gender. For analyses in this paper, PASW Statistics software (version 18) was used. However, more precise variance estimates can be calculated by specifying and using the exact sample design. Therefore, when calculating 95% confidence intervals to determine if the differences in the prevalences were significant, analyses were made by Stata statistical software (version 12). The possible lack of precision in variance estimation due to cluster sampling of this study was thus taken into account by using Stata procedures for complex survey designs [40].

### 3. Results

**3.1. Prevalence of Overweight and Obesity.** Within genders, none of the differences in the prevalence of overweight between survey years was statistically significant (Table 2). However, the proportion of overweight boys increased linearly from 13% in 1994 to 20% in 2006. The corresponding

TABLE 3: Prevalence (%) of self-perceived weight with 95% confidence intervals (CI) among 15-year-old overweight adolescents by survey year.

	1994 % (95% CI)	1998 % (95% CI)	2002 % (95% CI)	2006 % (95% CI)	2010 % (95% CI)
Overweight boys	<i>n</i> = 69	<i>n</i> = 99	<i>n</i> = 152	<i>n</i> = 149	<i>n</i> = 165
Too thin	2.9 (0.8–10.2)	1.0 (0.1–7.2)	1.8 (0.6–5.4)	2.2 (0.7–6.6)	2.4 (0.9–6.4)
About right	31.4 (20.8–44.5)	29.6 (21.6–39.0)	36.0 (27.7–45.1)	32.4 (24.5–41.4)	33.9 (26.6–42.1)
Too fat	65.7 (54.0–75.8)	69.4 (59.7–77.6)	62.2 (53.4–70.3)	65.5 (56.2–73.7)	63.6 (55.3–71.2)
Overweight girls	<i>n</i> = 26	<i>n</i> = 65	<i>n</i> = 81	<i>n</i> = 106	<i>n</i> = 113
Too thin		0.0	0.0	1.0 (0.1–7.0)	1.8 (0.4–6.9)
About right		9.4 (4.4–19.0)	1.2 (0.2–8.4)	5.9 (2.7–12.5)	9.7 (5.6–1.6)
Too fat	100.0	90.6 (81.0–95.6)	98.8 (91.6–99.8)	93.1 (86.2–96.6)	88.5 (81.7–93.0)

*n* = Number of overweight adolescents in the sample.

proportions for girls were 4% and 12%, respectively. Results from the 2010 survey revealed a turning point; linear increase in the proportions of overweight adolescents seemed subsided in both genders. Between genders, boys reported statistically significantly higher levels of overweight than girls throughout the study period.

The prevalence of obesity increased from 1% in 1994 to 4% in 2006 in boys and from 1% in 1994 to 2% in 2010 in girls (Table 2). Nevertheless, none of the differences between years or genders was statistically significant according to the prevalence estimates and their 95% confidence intervals. Due to low number of cases in the obesity group, we combined the preobese and obese cases and refer to them as overweight in the later text.

**3.2. Self-Perception of Weight in Overweight Adolescents.** There were no statistically significant differences in self-perception of weight among overweight adolescents between survey years of 1994–2010 (Table 3). Two-thirds of overweight boys and some 90% of overweight girls reported perceiving their bodies as too fat. Corresponding prevalences for nonoverweight adolescents varied from 9 to 14% in boys and from 37 to 43% in girls (data not shown). Overweight boys reported that they believe their body is about the right size statistically more often than overweight girls throughout the study period (Table 3).

The mean values of Emotional Investment in the Body (BIS) scores were statistically significantly lower in overweight adolescents than in nonoverweight adolescents in both genders and in both 2006 and 2010 surveys (Table 4). The higher scores of BIS indicate a better body image. The BIS mean values for girls were significantly lower than for boys in both weight status groups (i.e., in overweight and nonoverweight). Within genders or weight status groups, there were no statistically significant differences in the mean values of BIS scores between years 2006 and 2010.

**3.3. Weight Control Behaviour in Overweight Adolescents.** The proportions of overweight adolescents engaged in weight control behaviour at the time of filling in the survey surged from 3% in 1994 to 18% in 2006 in 15-year-old overweight

TABLE 4: Mean values of the Emotional Investment in the Body (BIS) scores and 95% confidence intervals (CI) in overweight and nonoverweight 15-year-old adolescents in 2006 and 2010.

	BIS mean value <sup>1</sup> (95% CI)	
	2006	2010
	Boys	
Overweight <sup>2</sup>	20.9 (20.1–21.7)	21.2 (20.5–21.9)
Nonoverweight <sup>3</sup>	22.7 (22.3–23.1)	23.6 (23.3–23.9)
	Girls	
Overweight <sup>2</sup>	17.4 (16.4–18.3)	16.7 (15.5–17.9)
Nonoverweight <sup>3</sup>	19.9 (19.5–20.5)	19.9 (19.3–20.1)

<sup>1</sup>Emotional Investment in the Body (BIS) score range from 6 to 30, the higher the better.

<sup>2</sup>Overweight include obesity.

<sup>3</sup>Nonoverweight include normal and underweight.

boys and from 19% in 1994 to 39% in 2010 in 15-year-old overweight girls (Table 5). The prevalences of current weight controlling for nonoverweight adolescents varied from 2 to 4% in boys and from 5 to 14% in girls during 1994–2010 (data not shown).

Based to the prevalence estimates and their 95% confidence intervals presented in Table 5, the difference in the prevalence rates of current weight controlling was statistically significant between years 1994 and 2006 in overweight boys. On the other hand, there was no statistically significant difference between years 2006 and 2010. In contrast to boys, the highest prevalence (39%) in current attempts to lose weight during the study period was observed in 2010 in overweight girls. None of the differences in the prevalences between survey years was statistically significant in overweight girls. Between genders, the difference in the prevalence of current weight controlling was statistically significant in 1998, 2002, and 2010.

There were no statistically significant differences within genders in the proportions of overweight adolescents, who gave an affirmative answer to the question of “Have you gone on a diet, changed their eating habits, or done something else to control your weight during the last 12 months?” between years 2002, 2006, and 2010 (Table 5). Based the

TABLE 5: Prevalence (%) of attempts to control weight with 95% confidence intervals (CI) among overweight adolescents by survey year.

	Current <sup>1</sup> weight controlling % (95% CI)				
	1994	1998	2002	2006	2010
Overweight boys	2.5 (0.6–9.9)	9.3 (5.1–16.3)	12.3 (7.5–19.6)	17.8 (12.6–24.6)	13.3 (9.0–19.2)
Overweight girls	19.2 (8.3–38.3)	26.2 (16.4–38.9)	33.3 (23.6–44.8)	28.6 (21.2–37.2)	39.3 (31.0–48.2)
	During previous 12 months <sup>2</sup> % (95% CI)				
Overweight boys			26.9 (19.8–35.5)	25.9 (18.8–34.6)	21.5 (15.8–28.5)
Overweight girls			70.9 (60.1–79.8)	56.4 (45.9–66.4)	62.5 (52.3–71.7)

<sup>1</sup>Prevalence of overweight adolescents who were on a diet or did something else to control their weight at the time of filling in the survey form.

<sup>2</sup>Prevalence of overweight adolescents who had gone on a diet, changed their eating habits or done something else to control their weight at some point during the last 12 months leading up to the survey; available from 2002.

prevalence estimates and their 95% confidence intervals, attempts to control weight during the previous 12 months were significantly more common among overweight girls (56–71%) than boys (22–27%) in 2002, 2006 and 2010. The corresponding prevalences for nonoverweight adolescents varied from 5% in 2010 to 8% in 2002 in boys and from 38% in 2010 to 50% in 2002 in girls (data not shown).

There was no statistically significant difference between years 2002, 2006, and 2010 in the prevalence rates of using specific weight control practices among overweight adolescents who had tried to control their weight (Table 6). The most common indicated weight control practices were exercising (>85%), eating fewer sweets (>84%) and less fat (>75%), and drinking fewer soft drinks (>74%). Throughout the study, a higher proportion of overweight girls than boys, who have tried to control their weight, indicated to have used all the specific weight control practices with exception of skipping meals and eating fewer sweets in 2006. However, statistically significant differences between genders were found only in eating smaller portions in 2002 and 2010, and smoking more in 2006.

#### 4. Discussion

The current study monitored the prevalence rates of self-perceived weight and weight control behaviour among overweight adolescents in Finland. There were no significant differences in self-perception of weight between the survey years of 1994, 1998, 2002, 2006, and 2010. It seems that the prevalence of self-perceived overweight has remained stable in the 2000s among the overweight Finnish adolescents after the decrease during 1979–1999 reported in the Adolescents Health and Lifestyle Survey [2]. It also appears that the increased prevalence of obesity in the surrounding society has not greatly influenced the criteria of an ideal body type among adolescents, that is, the reference for “desired weight” has not been made more relaxed. The vast majority of 15-year-old overweight adolescents perceived their bodies as too fat, their body image was lower than in nonoverweight adolescents, and attempts to lose weight were prevalent especially among overweight girls across the study period.

The unhappiness with body weight and engagement in weight control behaviour showed a clear gender difference, as overweight girls reported more often their discontent than

the overweight boys. The gender discrepancy in the self-perception of body weight was remarkable: some 90% of overweight 15-year-old females felt that they are either “a bit too fat” or “much too fat,” whereas the corresponding proportion for males remained under 70% throughout the study period of 1994–2010. Overweight girls were also more likely to report weight control behaviour compared to boys. The above findings may be a positive indication of girls’ better health awareness, or alternatively, the results can be interpreted as a negative indication of more intense appearance pressure to be thin. These indications may also be related to each other: adolescent girls are often focused on appearance and weight loss in describing the aspects of the healthy eating [15, 41].

The prevalence of weight-related teasing has remained stable among both overweight and nonoverweight adolescents in the USA during 1999–2004 [38]. Some studies even claim that the stigmatisation of obesity by children and adolescents has risen [13, 42]. Bullying has been found to have a significant impact on the young people’s desire to lose weight [17, 43]. Bullying because of body size has also been found to be associated with dieting and unhealthy weight loss practices, even regardless of adolescents’ weight status [43]. This might be one explanation why girls with and without overweight were discontent with their bodies and, more commonly than boys, tried to lose weight. Girls in particular are pointed out as overweight, and they will receive directives to lose weight from both girls and boys more often than boys do [17]. Haines and her coauthors [38] propose that the increase in obesity among youth may have resulted in relaxed body size and shape standards particularly for males, whereas the ideal female weight and shape has remained unchanged. The focus of body-related teasing among males may have moved to muscularity instead of body weight. Results from a study of muscle dissatisfaction in young adult men in Finland [44] also support this presumption.

The prevalence of weight control behaviour at the time of filling in the survey was statistically significantly higher in 2006 compared to 1994 in 15-year-old overweight boys. However, the difference between genders was more notable. Even in 2006, when the highest prevalence (18%) of current dieting in boys was found, considerably higher proportion (26%) of overweight girls was engaged in weight control. In addition, compared to one in four overweight boys, every second of overweight girls answered that they have gone on

TABLE 6: Prevalence (%) of reported use of specific weight control practices with 95% confidence intervals (CI) among 15-year-old overweight adolescents who have done something to control their weight during the last 12 months by survey year.

	Overweight boys			Overweight girls		
	2002	2006	2010	2002	2006	2010
	Weight control practice % (95% CI)					
Exercise	83.3 (65.1–93.1)	88.9 (74.0–95.7)	88.2 (71.8–95.7)	94.5 (84.2–98.3)	100.0	94.2 (85.5–97.8)
Skipped meals	43.9 (29.2–59.7)	44.4 (29.5–60.4)	32.4 (19.0–49.3)	48.1 (36.1–60.4)	40.4 (28.2–53.8)	52.2 (40.1–64.1)
Fasting	4.9 (1.2–17.5)	8.3 (2.9–21.6)	11.8 (4.3–28.2)	11.1 (5.4–21.6)	14.8 (7.4–27.5)	15.4 (8.0–27.5)
Eat fewer sweets	90.2 (77.2–96.2)	97.2 (83.2–99.6)	85.3 (68.8–93.8)	96.3 (86.1–99.1)	93.0 (82.8–97.3)	100.0
Eat less fat	83.3 (69.2–91.8)	80.6 (66.1–89.8)	79.4 (62.4–90.0)	92.7 (81.9–97.3)	93.0 (82.2–97.4)	80.6 (67.8–89.1)
Drink fewer soft drinks	73.8 (58.1–85.1)	86.1 (70.9–94.0)	88.2 (71.9–95.7)	85.2 (72.5–92.6)	91.1 (80.4–96.2)	82.1 (67.9–90.8)
Eat less/smaller amounts	52.4 (39.3–65.2)	63.9 (49.3–76.3)	55.9 (39.8–70.8)	79.6 (67.3–88.1)	78.9 (65.1–88.3)	86.8 (77.0–92.5)
Eat more fruits/vegetables	70.7 (55.7–82.3)	80.6 (62.0–91.3)	67.6 (49.1–81.9)	83.3 (71.3–91.0)	87.7 (76.1–94.1)	88.2 (76.6–94.5)
Drink more water	73.2 (55.7–85.5)	75.0 (56.4–87.4)	61.8 (44.3–76.6)	89.1 (78.6–94.8)	80.7 (68.0–89.2)	76.5 (64.3–85.5)
Restrict diet	9.5 (3.6–23.1)	30.6 (16.9–48.8)	8.8 (2.8–24.6)	18.9 (10.5–31.5)	19.6 (11.4–31.7)	18.2 (10.6–29.4)
Vomiting	2.4 (0.3–14.8)	2.8 (0.4–17.6)	15.2 (6.5–31.4)	9.3 (4.1–19.5)	17.5 (10.2–28.5)	15.2 (8.2–26.3)
Use pills or laxatives	2.4 (0.4–15.1)	2.8 (0.4–17.6)	2.9 (0.4–18.6)	3.7 (1.0–13.3)	8.8 (3.9–18.6)	1.5 (0.2–10.2)
Smoke more	7.1 (2.4–19.2)	2.8 (0.4–17.7)	5.9 (1.4–21.2)	16.7 (9.2–28.4)	14.0 (25.0–86.0)	9.1 (4.1–19.1)
Diet under supervision	2.4 (0.3–15.2)	2.8 (0.4–17.6)	5.9 (1.5–20.3)	5.6 (1.9–15.4)	5.4 (1.9–14.5)	7.6 (3.3–16.4)

a diet, changed their eating habits, or done something else to control their weight during the 12 months previous of the survey in 2006.

Even though the weight control behaviour was common among overweight adolescents, and especially among girls, the majority of the overweight adolescents' weight control practices could be considered safe: exercising and eating fewer sweets were the most commonly indicated weight control practices. Unhealthy weight control practices have been found to become more common among overweight adolescents in the USA during 1999–2004 [6]. Our findings do not indicate the same development in Finland, even when taking into account the difference in the manner of

representation of the results (i.e., overall prevalence versus prevalence within those who have tried to control their weight). However, based on the prevalence of attempts to lose weight among overweight adolescents, and their responses regarding weight control practices in this study, weight control is difficult when you already have overweight even with the knowledge of practices and motivation induced by self-perceived fatness and body dissatisfaction. The current environment is obesogenic and carries conflicting demands for young people. Thinness is idolised and obesity stigmatised and concurrently, meals and snacks high in fat and sugar are encouraged to be eaten, and quick commercial solutions for weight loss are advertised [45].

In Finland, the prevention of childhood and adolescent obesity has received attention both nationally and locally in the 2000s, and the projects appear to be fruitful: there was a slight—but not statistically significant—decrease in the proportion of overweight in adolescents in 2010 compared to the rates in 2006. However, it has been stated that obesity prevention projects may lead to stigmatisation [46] or even to disordered eating and eating disorders, particularly among those with poor body image [47]. There appears to be a false dichotomy between the concerns of adolescent obesity and the body discontent in young people, as these two concerns are tightly interwoven in overweight adolescents' attempts to lose weight.

The findings of our study—overweight adolescents self-perceived overweight, lower body satisfaction, and attempts to lose weight—suggest that in the prevention of adolescent obesity, it is crucial to focus on methods that strengthen the adolescents' self-esteem and do not emphasize body shape and weight. Body satisfaction has been found to protect girls from weight gain even after stabilising the effects of body mass index and sociodemographic factors [48]. It is essential to create favourable conditions for strengthening the factors that provide protection from poor body image—such as good self-esteem, resilience to stress, and faith in self-efficacy—in young people's health promotion. Protective factors reinforce each other, so that the more assets a young person has, the more likely he or she is to engage in health-promoting behaviour [49].

The low prevalence of obesity (1–3%) together with limited sample sizes can be considered to be a limitation of this study; quantitative studies of only a few obese respondents were therefore not practical. Adolescents' self-reported and measured heights and weights have been found to be highly correlated, but generally a bias of underreporting body weight will contribute to an underestimation of the prevalence of overweight [50]. Therefore, the prevalence of overweight in Finnish adolescents may be higher than reported herein.

The HBSC study relies on adolescents' self-report, which raises questions about the reliability of the answers. The stability of the responses was investigated by a test-retest study in 2005 in Finland and was found to be acceptable. In addition, the self-assessment is in some cases the only way to obtain information about a phenomenon. However, adolescents may interpret the concepts of being on a diet and weight control differently than do adults or health professionals [51]. Further research is also needed on how and on what grounds young people assess their body [35], and more versatile indicators of self-perceived weight and weight controlling might produce higher validity of the measurement. Kautiainen [2] concluded that the implications of perceived weight for prevention of obesity and promotion of well-being are complex, because they may differ according to the severity of overweight, the adolescent's maturational, and psychological status as well as gender. It should be noted that while obesity is one of the most powerful predictors of body dissatisfaction, the level of discontent, and its consequences vary.

## 5. Conclusions

Results of this study demonstrated not only the self-reported overweight in Finnish 15-year olds, but also that the majority of overweight adolescents were aware of their weight status. Findings revealed apparent gender differences in self-perception of weight, body dissatisfaction, and in engagement in weight control behaviour among overweight adolescents. The results emphasise the need for further research into the impact of gender on the attitudes towards own weight and the importance of the size and shape of the body.

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