

Self-assessment and self-perception of the body in 18-year-old girls

Samooocena i autostrzeżenie własnego ciała przez 18-letnie dziewczęta

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Abstract

Introduction: Studies focusing on self-perception of one's body usually cover subjects with eating disorders. There is a lack of similar studies.

Aim of the study: Conducting survey research on self-assessment and self-perception of one's own body in girls.

Material and methods: A survey was conducted in 1047 female students (average age: 18 years \pm 0.25) focusing on self-assessment and self-perception of their body mass, body parts, and eating habits. The study subjects were divided into groups of normal weight, obese, and underweight according to their BMI and BMI-SDS.

Results: There were twice as many girls dissatisfied with their body weight in the underweight group and 10 times as many in the obese group. 8% of girls with normal body weight perceived their body as overweight. 70% of subjects with a normal body weight and ca. 25% of obese thought they were obese in the area of the abdomen, hips, buttocks, and thighs. Fear of gaining weight was characteristic most often for girls with abnormal body weight who confessed to eating disorders.

Conclusions: 1. Most 18-year-old girls do not demonstrate any symptoms of distorted body self-perception; a vast majority of girls with normal body weight exaggerate the shapes of body parts, which causes them to undertake measures aiming to lose weight. Only a quarter of obese subjects perceive their individual body parts as obese, which might result in their lack of motivation to lose weight. 2. It is necessary to introduce healthy lifestyle educators in schools to prevent ED and obesity in adolescents.

Key words: obesity, body image, self-assessment, girls, self-perception of body weight.

Streszczenie

Wstęp: Badania na temat autostrzeżenia obrazu własnego ciała dotyczą zwykle osób z zaburzeniami odżywiania. Brakuje takich badań w populacjach osób zdrowych.

Cel pracy: Przeprowadzenie badań ankietowych dotyczących samoooceny i autostrzeżenia własnego ciała u 18-letnich dziewcząt.

Materiał i metody: U 1047 uczennic (średni wiek: 18 lat \pm 0,25 roku) przeprowadzono badanie ankietowe dotyczące samoooceny, autostrzeżenia wagi ciała i poszczególnych jego części, zachowań żywieniowych. U badanych oceniono BMI, BMI-SDS, dzieląc je na grupę z normową, otyłością i niedowagą.

Wyniki: Niezadowolonych było 2-krotnie więcej w grupie z niedowagą i 10-krotnie u otyłych; 8% dziewcząt z prawidłową masą ciała widziało u siebie nadwagę, a 70% z normową i ok. 25% otyłych uważało, że ma otyłość w obrębie brzucha, bioder, pośladków, ud. Obawę przed przytęciem miały najczęściej dziewczęta z normową, które przyznawały się do napadowego objadania się, wymiotów i gimnastykowania się.

Wnioski: 1. Co prawda u większości dziewcząt w 18. roku życia nie stwierdza się zaburzeń autostrzeżenia obrazu własnego ciała, jednakże zdecydowana większość dziewcząt z prawidłową masą ciała wyolbrzymia kształty poszczególnych części swojego ciała, co prowadzi do podejmowania przez nie działań nastawionych na odchudzanie i zagraża rozwojem zaburzeń odżywiania. Z kolei zaledwie 1/4 otyłych postrzeżę u siebie otyłość w zakresie poszczególnych części ciała, co może skutkować brakiem motywacji do odchudzania. 2. W celu profilaktyki zaburzeń odżywiania i otyłości u adolescentów istnieje potrzeba wprowadzenia w szkołach edukatorów zdrowego stylu życia (lekarzy, pedagogów, psychologów).

Słowa kluczowe: otyłość, samooocena, dziewczęta, obraz ciała, samopostrzeżenie masy ciała.

Introduction

Recent years have seen a considerable rise in the incidence of eating disorders (ED), particularly in young people [1]. These disorders may lead to lowering of the quality of life and shortening of life of affected individuals.

The aetiology of ED is not fully known. The most plausible is a multi-cause model of such disorders; nevertheless, it should always be investigated individually for a specific patient. The biopsychological aetiological model of ED comprises predisposing factors, triggering factors, and sustaining factors. Predisposing factors are genetic and biological factors (sex, body weight, temperament), personality factors, mental factors (negativism, emotional immaturity, anxiety), family factors, and environmental factors (overprotectiveness, lack of autonomy, criticism, neglect, trauma). The group of triggering factors includes social factors (negative comments from the environment, peer relationships), psychological factors (low self-esteem, mental trauma, a negative image of one's own body), and cultural factors (media pressure, the fashion for slimming, the slim figure ideal). Sustaining factors may be a distorted and deformed body image, discrepancies between the actual/ideal body image, social alienation, and low self-esteem [2].

Body image is a term coined by Schilder [3] and developed by subsequent scholars (Garner, Rucker & Cash, Grogan), signifying the process of self-perception leading to the development of a 3-dimensional body model. A complex body image consists of multiple elements, such as perceptual, cognitive, emotional, and behavioural components, subjected to diverse internal and external stimuli [4, 5]. The process of building one's body image lasts many years and consists of forming a construct comprising perceptions, experiences, interactions, and assessments (one's own and other people's), such as – without limitations – body weight, height, circumferences, shapes, silhouette, profile, figure, body weight gains and losses, taste, smell, touch, sounds of the body, and introceptive (visceral) feeling.

There are many theories on the development of the body image and its components. Each of them, however, contains 2 common elements: the physical component of the body (the carnal self), experienced through senses and receptors (self-perception), and the non-physical component of the body (the psychological self), consisting of all the other components, such as mental, emotional, and behavioural representation (self-assessment) [6].

A distorted image of one's own body constitutes a common component of most EDs. According to the concept of Williamson, it is developed on the basis of an unconscious cognitive bias accepted by an individual to be true and not succumbing to objective persuasions. Some stimuli may evoke a cognitive bias in susceptible individuals, and in some they become triggering mechanisms for eating disorders or may contribute to the persistence of eating disorders in which the emotional component plays a key role [7].

According to some authors, as many as over three-quarters of ED patients assess their body size incorrectly, with the tendency to exaggerate it [8, 9], whereas individuals with a normal

body weight are dissatisfied with some body parts, the sizes of which they overestimate, which contributes to a higher level of dissatisfaction on their part [10].

Distorted perception of one's body shape may concern the entire body or its individual parts, particularly hips, buttocks, and abdomen. The patient believes their body is too fat and inadequate to their expectations; internally, they confront their appearance with an idealised image of an immaterial, hypothetical body, the size or rather shape of which they would like to attain. In contrast to healthy individuals, this assessment is not subject to criticism and becomes obsessive content of abnormal thinking.

Studies devoted to self-perception of one's own body usually cover subjects with eating disorders or mentally ill individuals. There is no extensive research of this type in healthy populations. Therefore, it seems justified to conduct such research in a group of people who are the most susceptible to eating disorders, i.e. adolescent girls.

Aim of the study

Conducting a survey study on self-assessment and self-perception of one's own body by 18-year-old girls – students at secondary schools.

Material and methods

This study constitutes the second part of the research carried out in 1,047 18-year-old girls, secondary school students from Ruda Śląska (one of the largest, representative cities of the Silesian Metropolis in Poland): *Trends of underweight and obesity prevalence among adolescent girls in the selected population of the Silesian Agglomeration* [11]. The study was conducted during routine health check-ups of students graduating from secondary schools. The study protocol was approved by the Bioethics Committee of the Silesian Medical Chamber (Resolution No. 11/2006) and the consent of the school principals was also obtained. Legal guardians and patients over 12 years of age gave informed consent to participate in the study.

The survey consisted of the respondents filling out an anonymous questionnaire developed especially for the purposes of the project. The questionnaire contained validated questions pertaining to – without limitations – the respondents' self-assessment, expectations as to their body weight, self-perception of their body weight and individual parts of the body, as well as certain eating habits. The survey questions prepared for the project were prepared on the basis of questions used in earlier similar projects; however, they were detailed and corrected by the promoter in terms of the examined, much wider thematic scope.

Most respondents correctly completed the prepared questionnaire – single missing or incomplete answers (resulting most often from the need to ask the respondent about proper understanding of the question) were most often supplemented during the physical examination, and the researcher became familiar with the degree of completion of the questionnaire. The number of questionnaires excluded from the analysis, due to missing information or intentional resignation from answering, was 14.

These questionnaires were not taken into account and were included in the total number of people surveyed in the project.

All the girls had their body weight and height measured. Anthropometric measurements were made on a certified, standardized medical scale with a height gauge. The measurements were made personally by the examining physician.

The following values were calculated: BMI (body mass index = body mass [kg] / height [m²]) and BMI-SDS (standard deviation score), i.e. the value of the BMI standard deviation score from the mean BMI for the age and sex according to the formula: BMI-SDS=current BMI of the subject [kg/m²] – BMI equal to the 50th centile [kg/m²]: 1/2 ´ BMI equal the 50th centile [kg/m²] – BMI equal to the 3rd centile [kg/m²]. BMI was assessed based on percentile grids for the relevant sex and age currently in force in Poland [12]. The obtained body of data was entered on the back of the questionnaire.

To assess the subjects' nutritional status, the girls were classified to one of the 3 following groups: 1. With normal body weight (-2 < BMI-SDS < +2), 2. With body weight below normal limits (≤ -2 SDS), and 3. With obesity (BMI-SDS ≥ +2).

The subsequent part of the study consisted of the comparison and verification of the obtained values of the studied girls' auxologic parameters against the data deriving from the questionnaire in items devoted to self-perception of their nutritional status.

Statistical analysis

The database was drawn up in a Microsoft Excel spreadsheet. Statistical calculations were performed by means of Statistica v. 4.3 En. The significance level adopted in the statistical calculations was $\alpha = 0.05$. The following values were determined: arithmetic mean, median, minimum and maximum value, standard deviation (SD), lower and upper quartile, standard error (SE) and 95% confidence interval for the mean value, skewness, and kurtosis. Their distributions were checked for compliance with the normal distribution. The compliance assessment was based on the Shapiro-Wilk test and histograms of variables with the Gaussian curve plotted on them. Contingency tables were calculated for qualitative variables, and a cross-tabulation analysis was performed. Summary crosstabs, tables of expected values, as well as differences between observed and expected values were calculated. On the basis of the tables, descriptive statistics were calculated: Pearson's chi-square test and significance level p , Kendall's tau-b correlation coefficient, and Spearman's correlation coefficient. The results were presented graphically by means of interaction diagrams and categorised histograms.

Ethical standards

The study obtained consent from the Bioethics Committee of Silesian Medical Chamber (Resolution No. 11/2006) and of the management boards of individual schools.

Results

The average age of the studied girls was 18 ±0.25 years (range: 17.5–18.5 years). Their auxologic parameters were as

follows: mean height 164.3 ±0.18 cm (range: 145–185 cm), mean body mass: 57.72 ±0.32 kg (range: 34.0–122.0 kg), mean BMI: 21.32 ±0.11 kg/m² (14.6–43.7), mean BMI-SDS: 0.44 ±0.06 (-3.6–14.0).

A total of 802 girls had a normal body weight, which constituted 76.6% of the study subjects. Also, 65 girls (6.21%) had low body weight, and 180 girls (17.19%) were obese.

Self-assessment

On the basis of the questionnaire, it was determined that the number of girls satisfied (511 study subjects, which constitutes ca. 48.85%) and dissatisfied (535 study subjects, i.e. 51.15%) with their current body weight was similar. In the group of underweight girls there were ca. twice as many girls who were dissatisfied than satisfied (42 vs. 23 girls). In the group of obese girls there were ca. 10 times more girls dissatisfied with their body weight than girls who were satisfied (163 vs. 17 girls). On the other hand, ca. 59% (471 study subjects in this group) of girls with a normal body weight were satisfied with their current body weight, and 40% were not (Table I).

Out of all the study subjects who provided a response to the question on problems with maintaining their body weight, ca. one-third of respondents (331 girls, i.e. 31.83%) replied

Table I. Number and share of the study subjects in the breakdown according to satisfaction with current body weight and problems with maintaining body weight, as declared by the study subjects

Self-assessment	Satisfaction with current body weight total (n = 1,046)		Problem with maintaining body weight total (n = 1,040)
Studied girls	Yes n = 511 (100%) number (share)	No n = 535 (100%) number (share)	Yes n = 331 (100%) number (share)
Girls with normal body weight	471 (92.17%)	330 (61.68%)	184 (55.59%)
Underweight girls	23 (4.50%)	42 (7.85%)	17 (5.14%)
Obese girls	17 (3.33%)	163 (30.47%)	130 (39.27%)
% of total	[48.85%]	[51.15%]	[31.83%]
Pearson's χ^2	148.32, $p < 0.001$		170.62, $p < 0.001$
R Spearman rank	0.26, $p < 0.001$		0.34, $p < 0.001$

that they did have such a problem. These were usually girls with a normal body weight (55.59%), then obese girls (39.27%), and underweight girls were the least likely to have such a problem (5.14%). Among underweight girls, the majority (47 study subjects, i.e. 73.4%) did not report any issues with maintaining their body weight, similarly to most girls with a normal body weight (615, i.e. 76.9%), whereas obese girls reported this problem in the vast majority (130 study subjects, i.e. 74.7%) (Table I).

Expectations as to one's body weight

The question concerning the expected body weight was answered by the majority of respondents that they would like to weigh a bit less (464 study subjects), including over 81% of girls with normal body weight; the next group were girls wanting to weigh as much as they did at the time of the study (287 study subjects) – including over 94% with a normal body weight. The group of girls who wanted to weigh more consisted of 157 study subjects, the majority of whom (ca. 65%) had normal body weight, and the group of girls who wanted to weigh much less comprised 136 girls, of whom 65% were obese (Table II).

Among girls with the body weight deficiency, most expressed their willingness to reach a greater body weight than their current one (53 study subjects, i.e. 81.5%), 10 of whom (15.38%) expressed a wish to weigh as much as they did, whereas 2 subjects from this group (3.08%) wanted to weigh a bit less. None of the underweight girls declared their willingness to weigh much

less. Among obese girls, the majority claimed they wanted to weigh much less (89 study subjects, i.e. 49.4%) or a bit less (83 study subjects, i.e. 46%). Only 6 obese girls (3.3%) wanted to weigh as much as they did. In the group of girls with a normal body weight, on the other hand, most girls declared they wanted to weigh a bit less (379 respondents, which constitutes 47.4%), whereas 271 respondents, i.e. 33.9%, wanted to weigh the same (Table II).

Self-perception of body weight, silhouette, and individual body parts

The question "Do I consider myself a skinny person?" received an affirmative answer from girls with a normal body weight (52.63%) and underweight girls (47.37%) with similar frequency. None of the obese girls believed themselves to be "skinny". The question "Am I slim?" was most often answered affirmatively by girls with normal body weight (81.77%), and least often by obese girls (1.48%). The question "Do I have normal body weight?" was decisively most often answered affirmatively by girls with normal body weight (93.26%), and then by obese respondents (6.03%). Underweight girls were the least likely to reply to this question affirmatively. On the other hand, in the case of the question "Do I consider myself an overweight or fat person?", obese girls replied affirmatively the most often (61.49% and 76.60%, respectively). The next group in terms of frequency of an affirmative answer were girls with normal body weight (38.51% and 23.04%, respectively). None of the underweight girls considered themselves an overweight or fat person (Table III).

An analysis of individual groups of study subjects revealed the following:

1. In the group of underweight girls, most of them considered themselves slim (34 girls, which constitutes 52% of the group) or skinny (27 girls, i.e. 41%), whereas 6% of this group (4 girls) considered themselves as having normal body weight.
2. In the group of obese girls, most of them (107 respondents, i.e. 59.4%) perceived themselves as overweight, 20% as fat (36 respondents), and 18% (34 respondents) as persons with a normal body weight.
3. In the group of girls with normal body weight, most of them (526 girls, which constitutes 66%) believed that their body weight was normal, 21% (166 girls) believed they were slim, and 8% (67 respondents) that they were overweight (Table III).

Over 70% of girls with a normal body weight and ca. 25% of obese girls believed that they were obese in the area of their abdomen, hips, buttocks, and thighs. Body parts that obese girls believed to be too fat were, in this order: abdomen (109 respondents, i.e. 60% in this group), thighs (107 respondents, i.e. 59%), hips (72 respondents, i.e. 40%), and buttocks (51 respondents, i.e. 28%). Similarly, the group of girls with normal body weight were the most likely to believe that their abdomen was too fat (330 respondents, i.e. 41% in this group), followed by thighs (318 respondents, i.e. 39%), hips (207 respondents, i.e. 25%), and buttocks (140 respondents, i.e. 17%). Among

Table II. Number and share of the study subjects in the breakdown according to the body weight desired by the study subjects

Desired body weight			
Self-assessment			
Study subjects <i>n</i> = 1,044	The same <i>n</i> = 287 (100%) number (share)	A bit less <i>n</i> = 464 (100%) number (share)	Much less <i>n</i> = 136 (100%) number (share)
Girls with normal body weight	271 (94.43%)	379 (81.68%)	47 (34.56%)
Underweight girls	10 (3.48%)	2 (0.43%)	0
Obese girls	6 (2.09%)	83 (17.89%)	89 (65.44%)
% of total	[27.49%]	[44.44%]	[13.03%]
Pearson's χ^2	520.56, <i>p</i> < 0.001		
R Spearman rank	0.36, <i>p</i> < 0.001		

underweight girls, most of them did not see a problem of obesity of these body parts in themselves, and the ones who did report this problem (8 respondents) most often pointed to their thighs (Table IV).

Table III. Number and share of the study subjects in the breakdown according to their self-perception of their body

Body self-perception			
Self-perception			
Studied girls <i>n</i> = 1,047	Girls with normal body weight	Underweight girls	Obese girls
Skinny			
Yes	30 (52.63%)	27 (47.37%)	0
No	772 (77.98%)	38 (3.84%)	180 (18.18%)
Pearson's χ^2 179.38, <i>p</i> < 0.001			
R Spearman rank 0.28, <i>p</i> < 0.001			
Slim			
Yes	166 (81.77%)	34 (16.75%)	3 (1.48%)
No	636 (75.36%)	31 (3.67%)	177 (20.97%)
Pearson's χ^2 82.11, <i>p</i> < 0.001			
R Spearman rank 0.26, <i>p</i> < 0.001			
Normal			
Yes	526 (93.26%)	4 (0.71%)	34 (6.03%)
No	276 (51.14%)	61 (12.63%)	146 (30.23%)
Pearson's χ^2 192.48, <i>p</i> < 0.001			
R Spearman rank -0.14, <i>p</i> < 0.001			
Overweight			
Yes	67 (38.51%)	0	107 (61.49%)
No	735 (84.19%)	65 (7.45%)	73 (8.36%)
Pearson's χ^2 290.72, <i>p</i> < 0.001			
R Spearman rank -0.48, <i>p</i> < 0.001			
Fat			
Yes	11 (23.40%)	0	36 (76.6%)
No	791 (79.1%)	65 (6.5%)	144 (14.4%)
Pearson's χ^2 122.23, <i>p</i> < 0.001			
R Spearman rank -0.30, <i>p</i> < 0.001			

Eating habits and anti-obesogenic behaviour

Respondents provided answers to questions concerning their eating habits, such as the feeling of overeating, the fear of gaining weight, binge eating, vomiting after overeating, and attempts to lose weight at the time of the study or in the past.

Among these answers, the most frequent was the fear of gaining weight, as it occurred in 45.6% of all the respondents. The fear of gaining weight was most common in girls with a normal body weight (70.9% of the girls). 42.5% of the respondents admitted to binge eating. The group of study sub-

Table IV. Number and share of the study subjects in the breakdown according to their perception of their individual body parts as obese

Perception of body parts			
Self-perception			
Studied girls <i>n</i> = 1,047	Girls with normal body weight	Underweight girls	Obese girls
Abdomen obesity			
Yes	330 (73.99%)	7 (1.57%)	109 (24.44%)
No	472 (78.54%)	58 (9.65%)	71 (11.81%)
Pearson's χ^2 51.35, <i>p</i> < 0.001			
R Spearman rank -0.07, <i>p</i> < 0.001			
Hips obesity			
Yes	207 (73.14%)	4 (1.41%)	72 (25.44%)
No	595 (77.88%)	61 (7.98%)	108 (14.14%)
Pearson's χ^2 30.31, <i>p</i> < 0.001			
R Spearman rank -0.16, <i>p</i> < 0.001			
Buttocks obesity			
Yes	140 (71.79%)	4 (2.05%)	51 (26.15%)
No	662 (77.70%)	61 (7.16%)	129 (15.14%)
Pearson's χ^2 18.58, <i>p</i> < 0.001			
R Spearman rank -0.13, <i>p</i> < 0.001			
Thighs obesity			
Yes	318 (73.44%)	8 (1.85%)	107 (24.71%)
No	484 (78.83%)	57 (5.44%)	73 (11.89%)
Pearson's χ^2 4.85, <i>p</i> < 0.001			
R Spearman rank -0.21, <i>p</i> < 0.001			

jects with a normal body weight most often admitted to binge eating episodes and vomiting after them (77.9% and 69.2%, respectively). On the other hand, the feeling of overeating was reported by 26.7% of respondents, also most frequently by girls with a normal body weight, followed by obese girls (76.3% vs. 20.1% of respondents, respectively) (Table V).

An analysis of the numbers of girls who provided affirmative answers to questions on abnormal eating habits separately in individual groups revealed the following:

1. In the group of underweight girls, the feeling of overeating was felt by 15% of the respondents (10 girls), whereas 7% (5 girls) were afraid of gaining weight. In 40% (126 individuals) within this group binge eating episodes were reported,

Table V. Number and share of the study subjects in the breakdown according to their eating habits

Eating habits			
Studied girls <i>n</i> = 1,046	Girls with normal body weight	Underweight girls	Obese girls
Feeling of overeating, <i>n</i> = 1,047			
Yes	213 (76.34%)	10 (3.58%)	56 (20.07%)
No	589 (76.69%)	55 (7.16%)	124 (16.15%)
Pearson's χ^2 6.05, <i>p</i> < 0.001			
R Spearman rank -0.06, <i>p</i> = 0.025			
Fear of gaining weight, <i>n</i> = 1,047			
Yes	339 (70.92%)	5 (1.05%)	134 (28.03%)
No	463 (81.37%)	60 (10.54%)	46 (8.08%)
Pearson's χ^2 101.59, <i>p</i> < 0.001			
R Spearman rank -0.15, <i>p</i> < 0.001			
Binge eating episodes, <i>n</i> = 1,046			
Yes	346 (77.93%)	26 (5.86%)	72 (16.22%)
No	455 (75.58%)	39 (6.48%)	108 (17.94%)
Pearson's χ^2 0.78, <i>p</i> = 0.675			
R Spearman rank 0.01, <i>p</i> = 0.680			
Vomiting after binge eating, <i>n</i> = 1,045			
Yes	9 (69.23%)	0	4 (30.77%)
No	791 (76.65%)	65 (6.3%)	176 (17.05%)
Pearson's χ^2 2.31, <i>p</i> = 0.314			
R Spearman rank -0.04, <i>p</i> = 0.129			

after which none of the respondents admitted to provoking vomiting.

2. In the group of obese girls, the fear of gaining weight was the most common, occurring in 74% of respondents (134 girls). 40% of girls from this group (72 girls) reported binge eating episodes, and the feeling of overeating occurred in 31% (56 study respondents). Only 4 obese study subjects admitted to provoking vomiting after binge eating.
3. In the group of girls with a normal body weight, most of the girls had had binge eating episodes (346 respondents, i.e. 43%), and 42% (339 study subjects) reported the fear of gaining weight, whereas 213 girls (ca. 23%) had had a feeling of overeating. Nine girls from this group, i.e. ca. 3% of the girls, admitted to vomiting after binge eating episodes (Table V).

37.6% of study respondents admitted to attempts at losing weight in the past, and 13.1% to trying to lose weight at the time of the study. The biggest share of the girls reporting attempts at losing weight in the past or at the time of the study were girls with a normal body weight (71.5% and 58.4%, respectively). None of the underweight girls admitted to undertaking attempts at losing weight in the past or at the time of the study. In the group of obese subjects, ca. 62% of respondents (112 girls) admitted to attempts at losing weight undertaken in the past, whereas ca. 31% (57 respondents) admitted to such attempts at the time of the study (Table VI).

Girls with a normal body weight admitted to physical effort undertaken to maintain the desired body weight most often (77.9%), followed by obese girls (19.9%). Obese girls were the

Table VI. Number and share of study subjects in the breakdown according to attempts at losing weight

Attempts at losing weight			
Studied girls <i>n</i> = 1,046	Girls with normal body weight	Underweight girls	Obese girls
Attempts at losing weight at the time of the study			
Yes	80 (58.39%)	0	57 (41.61%)
No	721 (79.32%)	65 (7.15%)	123 (13.53%)
Pearson's χ^2 71.13, <i>p</i> < 0.001			
R Spearman rank -0.25, <i>p</i> < 0.001			
Attempts at losing weight in the past			
Yes	281 (71.5%)	0	112 (28.5%)
No	520 (79.63%)	65 (9.95%)	68 (10.41%)
Pearson's χ^2 87.86, <i>p</i> < 0.001			
R Spearman rank -0.28, <i>p</i> < 0.001			

most likely to reach for slimming agents and laxatives (51.6%), followed by girls with normal body weight (46.77%). In the group of underweight girls, 11 girls, i.e. ca. 17% of this group of study subjects, admitted to exercising to maintain low body weight, and only one respondent in 65 reported that she had used slimming agents to this end. Over a half of obese respondents (101 girls, i.e. 56.4%) undertook physical exercise to reduce or maintain their body weight, whereas ca. 18% (32 girls) reported that they used slimming agents and laxatives to this end. On the other hand, in the group of girls with a normal body weight, ca. half (395 girls, which constitutes 49.3%) exercised to maintain their body weight, and only 3.6% of them (29 girls) used slimming agents (Table VII).

Sources of knowledge on maintaining body weight, dieting, and losing weight

The study subjects most often searched for information on maintaining body weight, dieting, and ways to lose weight on the Internet (40.4% of respondents), followed by youth magazines (35.2% of girls), and among their peers (26.6%). TV shows were used for this purpose the least often – only by 9.6% of all respondents. Girls who searched for this knowledge most often were those with a normal body weight. Only a third of underweight girls searched for information on maintaining body

Table VII. Number and share of the study subjects aged 18 years in the breakdown according to activities undertaken to reduce their body weight

Studied girls <i>n</i> = 1,045	Exercising to maintain body weight <i>n</i> = 1,045		Application of slimming agents/laxatives <i>n</i> = 1042
	Yes <i>n</i> = 507 (100%) number (share)	No <i>n</i> = 538 (100%) number (share)	Yes <i>n</i> = 62 (100%) number (share)
Girls with normal body weight	395 (77.91%)	406 (75.46%)	29 (46.77%)
Underweight girls	11 (2.17%)	54 (10.04%)	1 (1.61%)
Obese girls	101 (19.92%)	78 (14.50%)	32 (51.61%)
% of total	[48.52%]	[51.48%]	[5.94%]
Pearson's χ^2	30.65, <i>p</i> < 0.001		55.96, <i>p</i> < 0.001
R Spearman rank	0.13, <i>p</i> < 0.001		0.21, <i>p</i> < 0.001

weight in the sources referred to above, comparably often in youth magazines, among their peers, and on the Internet, and the least often on TV (Table VIII).

Both obese girls and girls with a normal body weight most often derived their knowledge on dieting and losing weight from the Internet (85 respondents, i.e. 47%, and 323 girls, i.e. 40%), then from newspapers (69 respondents, i.e. 38%, and 282 respondents, i.e. 35%), then from their peers (57 respondents, i.e. 32%, and 205 respondents, i.e. 25%), and the least often from TV commercials (18 respondents, i.e. 10%, and 80 respondents, i.e. 10%) (Table VIII).

Table VIII. Number and share of study subjects in the breakdown according to sources of knowledge on maintaining body weight

Knowledge on maintaining body weight			
Studied girls <i>n</i> = 1,045	Girls with normal body weight	Underweight girls	Obese girls
Youth magazines			
Yes	282 (76.63%)	17 (4.62%)	69 (18.75%)
No	518 (76.51%)	48 (7.09%)	111 (16.40%)
Pearson's χ^2 3.10, <i>p</i> = 0.211			
R Spearman rank -0.04, <i>p</i> = 0.123			
Internet			
Yes	323 (76.54%)	14 (3.32%)	85 (20.14%)
No	477 (76.57%)	51 (8.19%)	95 (15.25%)
Pearson's χ^2 13.08, <i>p</i> < 0.001			
R Spearman rank -0.09, <i>p</i> < 0.001			
Peers			
Yes	205 (73.74%)	16 (5.76%)	57 (20.50%)
No	595 (77.57%)	49 (6.39%)	123 (16.04%)
Pearson's χ^2 2.88, <i>p</i> = 0.236			
R Spearman rank -0.4, <i>p</i> = 0.114			
TV commercials			
Yes	80 (76.92%)	6 (5.77%)	18 (17.31%)
No	720 (76.51%)	59 (6.27%)	162 (17.22%)
Pearson's χ^2 0.04, <i>p</i> = 0.980			
R Spearman rank 0.00, <i>p</i> = 0.909			

Discussion

This paper constitutes an attempt at combining an objective anthropometric study of the surveyed girls with their own subjective assessment, i.e. self-assessment of their nutritional status.

The numbers of girls satisfied and dissatisfied with their current weight were comparable (48.9% vs. 51.6%), whereas 31.8% of respondents answered that they had problems with maintaining their bodyweight. Most girls with normal body weight were satisfied with their weight; this group, however, most often reported problems with maintaining their body weight. On the other hand, obese girls, similarly to underweight girls, were mostly dissatisfied with their weight.

Self-assessment and self-perception of one's body weight are among the factors influencing the development of ED. There are studies, also conducted in Poland, devoted to self-esteem and self-perception of body weight in obese subjects, subjects with ED, and in healthy teenagers [13–17].

One of the surveys covering 100 Polish girls (average age: 18.1 ± 0.3 years) demonstrated that – like in our study – more than a half of them did not accept their appearance. 53% of the study subjects declared undertaking measures to lose weight, whereas 6% did not believe they could succeed. Only 19% of girls found their appearance to be very good. The authors – like us – demonstrated that ca. a third of the studied girls reported problems with maintaining a normal body weight [13].

Szanecka *et al.* [18], while conducting a study in another group of 239 Polish girls, applied a model of a 7-stage body shape rating scale to check the way mothers perceived their daughters' body shape and the girls' own self-perception of their body shape, as compared to their actual body weight. In all the study subjects, divided into age groups: 8–13 years (230 girls) and 14–18 years (124 girls), anthropometric measurements were conducted and BMI-SDS values were calculated. Girls aged 8–13 years with normal body weight accurately assessed their body shape in 78.9% of cases, overweight girls in 70.6%, and obese girls in 41.7%. Younger obese girls underestimated their position in the body shape rating scale significantly more frequently than overweight girls or girls with normal body weight ($p < 0.001$), misjudging their physique. In the group of girls aged 14–18 years, on the other hand, most girls perceived their body weight accurately: obese girls in 67.2%, overweight girls in 74%, girls with normal body weight in 74%. However, obese teenage girls, like their mothers, underestimated their physique significantly more often than girls with normal body weight. The mother's body weight had no effect on the classification of the daughter's body shape. Teenage girls were more critical towards their own body shape than their mothers and believed that a slimmer silhouette than indicated by their mothers was optimal. The authors concluded that teenage girls are more interested in their appearance than younger children and are more likely to succumb to the pressure to be slim.

Other Polish authors [17] in their survey study analysed the relationship between eating habits and body self-perception

in a very large cohort of young people: school and college students (14,511 people: 7,825 females and 6,683 males). Most respondents assessed their body shape as normal (54.6%), more than the ones who thought they were slim (23.7%) or skinny (6%). 13.9% believed they were overweight, and 1.7% that they were obese. College students were more likely to see overweight or obesity in themselves than school students. Most respondents reported their satisfaction with the appearance of their bodies (79.6%), with 53.7% of people with normal body weight, 14.4% of underweight subjects, 9.5% of overweight subjects, and 1.9% of obese subjects. Ca. three-quarters of obese respondents admitted to attempts at reducing their body weight in the past.

An extensive cross-sectional study carried out in a large group of youths in the period of early adolescence (659 girls and 711 boys; average age: 14.5 ± 0.3 years) assessed the level of satisfaction with their body weight according to a satisfaction questionnaire and scale (*Rosenberg Self-Esteem Scale* and *Body Dissatisfaction Subscale of Eating Disorder Inventory*) with reference to the body mass index (BMI) of the study subjects. It was demonstrated that girls were less satisfied with their body weight significantly more frequently than boys ($p < 0.001$). Girls reported greater satisfaction with their body weight when they were underweight, similarly to boys. Girls with a normal body weight and obesity demonstrated greater dissatisfaction with their body weight. Among boys, obese ones were the least satisfied with their bodies. This seems to imply that there is a relationship between the level of dissatisfaction with one's own body weight and BMI in early puberty both in girls and boys.

Other researchers [19] analysed the relationship between the body shape and body dimensions and behavioural aspects of eating disorders in women (average age: 28.6 ± 11.24 years; average BMI: 22.2 ± 3.6 kg/m²), using the following tests: *Body Shape Test*, *Body Dissatisfaction Scale*, *Physical Appearance State and Trait Anxiety Scale*, and *Eating Attitudes Test*. They demonstrated that the older women are, the more aware of the actual appearance of their bodies and the ideal female body they are, and they are more aware what their bodies should be like for their appearance to satisfy the current standards of attractiveness and social acceptance. The youngest study subjects had the lowest awareness of their current body shape. Girls in late adolescence demonstrated stronger anxiety due to obese muscles, hips, and abdomen than any other subjects. Teenager girls and women aged 20–25 years admitted to the use of slimming diets and bulimic behaviours more often than older women. The strongest tendencies to adopt eating-related behaviours were demonstrated in girls aged 16–19 and women aged 20–25 years. This indicates that people at this age constitute a group that demonstrates the highest risk of ED development. In girls in late adolescence, dissatisfaction with their body shape correlated with behaviours bearing the hallmarks of *anorexia nervosa*, and of *bulimia nervosa* in young women. The authors believe that in adolescence, when the identity crisis conditioning personality development appears, girls aim to achieve in-

dependence and autonomy by controlling their bodies. Young women, on the other hand, relieve the tension towards their own bodies predominantly by engaging in compensatory, bulimic behaviours. It was also observed that adolescent girls are dissatisfied with their appearance despite having normal body weight. We had similar observations when we investigated a much larger group of girls (802) aged 18 years with normal body weight. As many as 330 of them (41%) reported their dissatisfaction with their current body weight.

A dominating tendency among the girls covered by our study was their desire to weigh a bit less, with the highest number of such answers given by girls with normal body weight (81.7%). 27.5% of girls wanted to maintain their current body weight, of whom 15% were underweight. Other researchers [20] obtained different results – they demonstrated that as many as 51% of girls would like to weight as much as they did during the study.

Our study subjects had the tendency to overestimate their body weight, which is common in individuals with eating disorders [9]. Overestimating one's body mass and dissatisfaction with one's body shape entails overestimating sizes of individual body parts, such as abdomen, buttocks, thighs, and face. We demonstrated that girls with a normal body weight believed they were obese in the area of the abdomen, thighs, hips, and buttocks twice as often as obese girls. Other authors [13] observed that their study subjects were the least satisfied with their thighs and hips, but their questionnaire did not include any questions about the abdomen.

The inadequacy between body mass self-assessment and objective assessment is confirmed by reports of other authors [21]. A biased perception and a lack of acceptance of one's own body shape and weight may lead to eating disorders. Individuals with ED have a distorted perception of the size of their bodies more often than healthy people. Nevertheless, adolescent girls are also prone to such behaviours, although to a lesser extent. This may be associated with the influence of idealising the image of one's body, so dominant at a young age, and the pressure of contemporary culture and media promoting a slim figure [22]. Among girls with normal body weight, the tendency to perceive their own bodies as too fat may be the beginning of disorders in perceiving their own bodies as an early symptom of eating disorders (*pre-anorexia*) [22]. It has been observed that in healthy individuals eating disorders begin with disorders in terms of thinking about and perceiving one's own body, with malnutrition as a distant consequence. Moreover, at this early stage, individuals who present such mechanisms are unaware of the risks they entail.

An interesting observation made in this study is self-perception in obese girls. Most of them underestimated their body weight, and ca. 80% of this group did not perceive themselves as obese.

Bąk-Sosnowska *et al.* [23] noticed that obese individuals often assess their bodies imaginarily rather than realistically, which according to Bruch [24] may constitute one of the strategies of dealing with the problem of excessive body mass and the feeling of one's own ineffectiveness in controlling the con-

dition of one's own body. According to other authors [25, 26], disorders in terms of perceiving one's own body concern also obese people, and not only ED and *anorexia nervosa* patients.

The results of our study regarding attempts at losing weight at the time of the study (38% of study subjects) or in the past (13%) in such a large, representative cohort may be associated with the fact that young people commonly undertake such attempts. Among all respondents, girls with normal body weight reported incidents of losing weight much more often than obese girls. Other authors demonstrated that 22% [27], or even 71% of 18-year-old girls [13], opted for slimming diets.

Nearly a half of the girls covered with our study, most often with a normal body weight, admitted to exercising in order to maintain or reduce their body weight. Investigation of physical activity and other slimming methods used by young people to reduce their body weight was also the subject matter of research carried out by other Polish authors [28, 29]. Ca. a third of the studied students had been on a slimming diet before [28], whereas ca. 40% of people aged 18 years [29] – similarly to our study – admitted to attempts at losing weight.

Polish literature contains works pertaining to sources of information and levels of awareness in adolescents on rules of appropriate nutrition [30–32]. Some authors [30] focusing on a group of 99 girls (average age: 14.9 ± 0.92 years; average BMI: 19.2 ± 2.5 kg/m²) demonstrated that 90% of respondents knew the term *anorexia*, and 30% suspected this illness in their environment. 36% of the girls were dissatisfied with their appearance and admitted to applying different methods of losing weight, predominantly fasting or skipping meals.

Other authors [31] emphasise that even though TV and Internet are the biggest sources of information on food products for young people, it is the habits of parents and the influence of peers that have a greater effect on consumer choices of children than advertising.

A survey conducted among 407 school students aged 13–18 years, including 59.7% of girls (average age: 15.5 ± 1.6 years; average BMI: 21.2 ± 2.8 kg/m²) and 40.3% of boys revealed that as many as 70.5% of the study subjects derived their knowledge on *anorexia nervosa* mainly from mass media (TV and Internet), and less often from school, from their parents, or any other sources [32]. Most respondents demonstrated good knowledge of AN symptoms and complications, whereas 54.3% of respondents claimed that falling ill with AN may be influenced by pressure from the environment, and 47.9% pointed to the media in this respect. The authors conclude that young people's knowledge on symptoms and complications of *anorexia nervosa* seems to be extensive and derived predominantly from mass media. However, due to a big share of teenagers with bad eating habits, as implied by the questionnaire results, there is a need for more education addressed to this group of young people in terms of preventing eating disorders.

This study complements the study carried out in the same group of girls, in which we assessed their nutritional status at the age of 18 years and retrospectively at the age of 14 years [11]. Therefore, we did not include all the auxological data in

this work. An element that might be regarded as a limitation of the study is the fact that the cohort we investigated comes from one region, and to be more precise from one city in Silesia, Poland. We realise that specific eating habits, housing conditions, parents' level of education, accessibility of schools, and numerous other socioeconomic and environmental conditions may influence the way young people perceive reality in a specific environment. Nevertheless, this study seems to be representative, reflecting population trends for this age group of girls due to the large group size. A strength of this study is the fact that all the girls participating in this survey were additionally examined, weighed, and measured by the same physician, which objectified the auxological measurements.

References

- Jagielska G, Kacperska I. Outcome, comorbidity and prognosis in anorexia nervosa. *Psychiatr Pol* 2017; 51: 205–218. doi: 10.12740/PP/64580.
- Ziora-Jakutowicz K, Zimowski J, Ziora K. Evaluation of the frequency of ADIPOQ c.45 T>G and ADIPOQ c.276 G>T polymorphisms in adiponectin coding gene in girls with anorexia nervosa. *Endokryn Pol* 2021; 72: 520–528.
- Schilder P. *The image and appearance of human body*. International Universities Press, New York 1950.
- Brytek-Matera A. *Obraz ciała-obraz siebie. Wizerunek własnego ciała w ujęciu psychospołecznym*. Wydawnictwo Diffin, Warszawa 2008.
- Grogan S. *Body image and Health. Contemporary perspectives*. *J Health Psych* 2006; 11: 523–530. doi: 10.1177/1359105306065013.
- Krueger DM. *Integrating body self and psychological self. Creating a new history in psychoanalysis and psychotherapy*. Brunner-Routledge, New York 2002.
- Williamson D. *An information processing perspective on body image*. Guilford Press, New York 2002.
- Cash T, Deagle E. The nature and extent of body image disturbances in anorexia nervosa and bulimia nervosa: a meta-analysis. *Int J Eat Disord* 1997; 22: 107–125.
- Rabe-Jabłońska J, Dunajska A. Poglądy na temat znaczenia zniekształconego obrazu ciała dla powstania i przebiegu zaburzeń odżywiania. *Psychiatr Pol* 1997; 31: 723–738.10.
- Sarver D, Wadden T, Foster G. Assessment of body image dissatisfaction in obese women. Specify, severity, and clinical significance. *J Consult Clin Psych* 1998; 66: 651–654. doi: 10.1037//0022-006x.66.4.651.
- Pałasz W, Ziora-Jakutowicz K, Oświęcimska J, et al. Trends of underweight and obesity prevalence among adolescent girls in the selected population of Silesian Agglomeration. *Pediatri Endocrinol Diabetes Metab* 2018; 24: 20–33.
- Palczewska I, Niedźwiecka Z. *Siatki centylowe oceny rozwoju somatycznego dzieci i młodzieży*. Instytut Matki i Dziecka, Warszawa 1999.
- Lwów F, Dunajska K, Milewicz A. Występowanie czynników ryzyka jadłowstrętu psychicznego i bulimii u 18-letnich dziewcząt. *Endokr Otyłość i Zab Przem Mat* 2007; 3: 33–38.
- Ferrer-García M, Gutiérrez-Maldonado J. *Body Image Assessment Software: psychometric data*. *Behav Res Methods* 2008; 40: 394–407. doi: 10.3758/brm.40.2.394.
- Lombardo C, Battagliese G, Lucidi F et al. Body dissatisfaction among pre-adolescent girls is predicted by their involvement in aesthetic sports and by personal characteristics of their mothers. *Eat Weight Dis* 2012; 17: 116–127. doi: 10.1007/BF03325335.
- Mäkinen M, Puukko-Viertomies L, Lindberd N, et al. Body dissatisfaction and body mass in girls and boys transitioning from early to mid-adolescence: additional role of self-esteem and eating habits. *BMC Psych* 2012; 12: 2–8. doi: 10.1186/1471-244X-12-35.
- Kapka-Skrzypczak L, Bergier B, Diatczyk J, et al. Dietary habits and body image perception among Polish adolescents and young adults – a population based study. *Ann Agric Environ Med* 2012; 19: 299–308.
- Szanecka E, Krajewska-Siuda E, Klimek K, et al. Percepcja masy ciała w wieku rozwojowym w ocenie dziewcząt i ich matek. *Endokr Otyłość i Zab Przem Mat* 2010; 6: 109–117.
- Rybicka-Klimczyk A, Brytek-Matera A. Wizerunek ciała i jego wymiary a aspekty behawioralne zaburzeń odżywiania u zdrowych kobiet w różnych fazach rozwojowych. *Endokr Otyłość i Zab Przem Mat* 2008; 4: 143–151.
- Mikiel-Kostyra K, Oblacińska A. Czynniki biologiczne, behawioralne i psychospołeczne, kształtujące masę ciała (BMI) 13-latków. *Raport z badań*. Instytut Matki i Dziecka, Warszawa 2010.
- Kołoło H, Woynarowska B. Samoocena masy ciała i odchudzanie się młodzieży w okresie dojrzewania. *Przeg Pediatri* 2004; 34: 196–201.
- Izydorczyk B, Rybicka-Klimczyk A. Poznawcze aspekty obrazu ciała u kobiet z zaburzeniami odżywiania. *Endokrynol Pol* 2009; 60: 287–294.
- Bąk-Sosnowska M, Trzcieniecka-Green A, Zahorska-Markiewicz B. Ekspresja obrazu własnego ciała u osób otyłych na podstawie analizy porównawczej rysunku człowieka i rysunku siebie. *Psychoterapia* 2004; 130: 37–44.
- Bruch H. *Eating disorders. Obesity, anorexia nervosa and persons within*. Basic Books, New York 1973.
- Garner M, Garfinkel E, Stancer C, et al. Body image disturbances in anorexia nervosa and obesity. *Psychosom Med* 1976; 38: 327–336. doi: 10.1097/00006842-197609000-00005.

Conclusions

- Even though most 18-year-old girls do not demonstrate any symptoms of distorted body self-perception, most girls with normal body weight exaggerate the shapes of their individual body parts, which causes them to undertake measures aiming to lose weight, and this poses a risk of developing eating disorders. On the other hand, only a quarter of obese subjects perceive their individual body parts as obese, which might result in their lack of motivation to lose weight.
- It is necessary to introduce healthy lifestyle educators in schools (physicians, counsellors, psychologists) to prevent eating disorders and obesity in adolescents.

26. Heinberg L. Theories of Body Image Disturbance: Perceptual, Developmental, and Sociocultural Factors. In: Body image, eating disorder and obesity. An integrative guide for assessment and treatment. Thompson J (ed.). American Psychological Association, Washington 1996: 27–49.
27. Wojnarowska B, Tabak I. Subiektywna ocena zdrowia dziewcząt w wieku 16 i 18 lat. W: Raport: Zdrowie kobiet w wieku prokreacyjnym 15–49 lat – Polska 2006, UNDP, UNFPA, Ministerstwo Zdrowia. Warszawa 2007; 76–79.
28. Nawrocka M, Kujawska-Łuczak M, Bogdański P et al. Ocena sposobu odżywiania i aktywności fizycznej wśród uczniów szkół ponadpodstawowych. *Endokr Otyłość i Zab Przem Mat* 2010; 6: 8–17.
29. Bogdański P, Łuczak M, Pupek-Musialik D. Physical activity among high school students in Poznan city. Środowiskowe źródła zagrożeń zdrowotnych. Lublin 2007; 1: 1–2.
30. Chwałczyńska A, Bemberek A. Ocena świadomości dziewcząt w wieku gimnazjalnym dotycząca jadłowstrętu psychicznego. *Endokr Otyłość i Zab. Przem. Mat* 2010; 6: 118–123.
31. Mazur A, Szymanik I, Matusik, et al. Rola reklam i mediów w powstawaniu otyłości u dzieci i młodzieży. *Endokr Otyłość i Zab Przem Mat* 2006; 2: 18–21.
32. Ziora K, Pilarz Ł, Sztylc J, et al. Ocena stanu wiedzy nastolatków na temat anorexia nervosa. *Endokr Otyłość i Zab Przem Mat* 2009; 5: 12–18.