

## Nutritional habits of female university students in relation to self-perception of body

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### Summary

*Study aim:* To determine whether the self-assessment of body mass has an impact on the nutritional behaviour of young women.

*Material and methods:* The material was gathered in cross-sectional research of 1129 female university students. The measurements of body height, body mass, and waist and hip circumference were taken. Each person completed a questionnaire concerned the nutritional habits, recreational physical activity, and self-perception of body mass. In this work, only the data of 925 students with BMI between 18.5 and 24.9 were included.

*Results:* Of the participants, 2.8% of the students assessed their body mass as too low, 75.4% as correct, and 21.8% as too high. Students assessing their body mass as too low featured the lowest values of BMI and waist circumference, whereas those with a body mass assessment of too high featured the highest values of BMI. Those students with a body mass assessment as too high followed a diet and skipped meals far more frequently, consumed breads and sweets far less frequently, and drank more liquids daily than students who assessed their body mass as correct. No differences were found in the frequency of recreational physical activity in relation to self-perception of body mass.

*Conclusions:* BMI values above population average, even if they fit within the norm, are regarded by the students as too high. The self-assessment of body mass as too high results in undertaking efforts aimed at reducing body mass.

**Key words:** Body mass perception – BMI – Nutritional habits – Physical activity

### Introduction

In Poland, as in many other European countries, the prevalence of obesity and overweight, as well as average relative body mass, is on the increase [4,5,9,18,20]. Simultaneously, the mass media has created a contrasting image that promotes slimmer and slimmer models and actresses, thus creating an even wider gap between an ideal and an average figure [1,19]. Many women compare their body mass not to standards recommended by professionals but to norms set by celebrities. That leads to overestimation and stimulates the pursuit for a slimmer figure.

Among young people, in particular young females, the concern over one's own image is ever so evident. In Western culture, appearance makes a very significant image factor. No wonder, then, that so many young women conform to the demands of fashion. However, diets that are often designed along homemade recipes with no professional supervision may have adverse effects on the health for those who, while being neither overweight nor obese, are determined to lose weight anyway. Many studies show that the phenomenon of groundless dieting is

on the increase among people with non-excessive body mass [6,11,13]. It has been proven that the decision of whether or not to go on a diet is frequently based not on actual body mass but rather on a perception of it being excessive [1,11,13]. Misperception of overweight constitutes one of the important factors affecting unhealthy behavior and thereby health in general. The aim of this study was to determine whether the self-assessment of body mass has an impact on the nutritional behavior of young women.

### Material and Methods

The material for this study has been gathered in cross-sectional research of female students at Jagiellonian University in Cracow, Jan Kochanowski University in Kielce, and the University of Opole. In total, 1129 students took part in the research. In this work, the data of 925 students with correct body mass (BMI = 18.5-24.9 kg/m<sup>2</sup>) were included. This constitutes 81.9% of the total. Measurements of body height, body mass, waist (WC) and hip circumference (HC) were taken and two

indices, i.e. Body Mass Index (BMI) and waist-to-hip ratio (WHR), were calculated

Each person completed a questionnaire. The questions posed in the questionnaire concerned the frequency of main meals (breakfast, lunch, dinner, and supper) and specified food consumption. In addition, the information concerning leisure-time physical activity and smoking was collected. In the final part of the questionnaire, the students were asked whether they considered their body mass as too low, correct or too high, and whether they would like to change their body mass.

The Shapiro-Wilk test was applied to determine normality of the distribution of variables; the Levene's test was used to assess homogeneity of variances. To evaluate the differences in terms of anthropometrical parameters between groups of a varied body mass self-assessment, the Kruskal-Wallis test followed by multiple comparisons of mean ranks for all groups was used. The selection of a non-parametric test resulted from the lack of homogeneity of variances between sub-groups. The significance of differences in the meal frequency, frequency of eating specified foods, and physical activity in leisure-time were estimated by using of the chi-square test. The level of  $\alpha = 0.05$  was considered significant.

## Results

A total of 26 (2.8%) students assessed their body mass as too low, 697 (75.4%) assessed it as correct, and 202 (21.8%) assessed it as too high. Table 1 presents anthropometrical data (mean  $\pm$  SD) according to student assessment of body mass. The self-perception of body mass is actually linked with real body mass, waist and hip circumference, Body Mass Index (BMI), and waist-to-hip ratio (WHR). Students assessing their body mass as too low featured the lowest values of the analyzed parameters,

whereas those with the body mass assessment as too high featured the highest values of the analyzed parameters. It is worth noting, though, that the average BMI and the waist circumference values in the group of students who overestimated their body weight were nowhere near the limits defining overweight, i.e. 25 kg/m<sup>2</sup> for BMI and 80 cm for waist circumference (Table 1).

Of the students who perceived their body mass as too high, 78.80% declared their wish to have lower body mass. Within a group that assessed their body mass as correct, this wish was expressed by only 10.9% of women, whereas a mere 1.3% want to have higher body mass. In the group of students who regarded their body mass as too low, not one person expressed the desire to have lower body mass, whereas 88.5% of them want to have higher body mass.

Further analysis investigated whether the perception of body mass had an influence on lifestyle. A comparison was made between two groups, namely between the students with correct body mass assessment and those who assessed their body mass as too high. Due to an insignificant number of students assessing their body mass as too low, the group was not included in the analysis.

Within the group that assessed their body mass as too high, the percentage of those on a weight-reducing or vegetarian diet equaled 23.8%, whereas among other students it equaled 8.3%. The difference was statistically significant ( $p < 0.001$ ). frequencies of daily main meal consumption are presented in Table 2. Students assessing their body mass as too high much less frequently declared that they have breakfast, lunch and supper every day and much more frequently declared they seldom have those meals than students who assessed their body mass as correct (Table 2). In the case of supper, the difference was particularly evident. Almost double the number of students who assessed their body mass as too high declared to rarely have this meal.

**Table 1.** Anthropometrics characteristic of surveyed female students (mean  $\pm$  SD)

Variable	Group 1 (n = 26)	Group 2 (n = 697)	Group 3 (n = 202)
Body height (cm)	163.1 $\pm$ 6.97	166.1 $\pm$ 5.82	163.6 $\pm$ 5.72
Body mass (kg)	52.4 $\pm$ 4.37	57.3 $\pm$ 5.32***	60.9 $\pm$ 5.73*** ###
Body Mass Index	19.5 $\pm$ 0.77	20.8 $\pm$ 1.23***	22.1 $\pm$ 1.50*** ###
Waist circumference (cm)	65.7 $\pm$ 5.26	70.4 $\pm$ 5.45***	73.4 $\pm$ 6.95*** ###
Hip circumference (cm)	90.0 $\pm$ 1.82	93.3 $\pm$ 5.03***	96.7 $\pm$ 6.79*** ###
Waist to hip ratio	0.73 $\pm$ 0.06	0.76 $\pm$ 0.06	0.77 $\pm$ 0.08*

Legend: Group 1 - Students who perceive their body mass as too low; Group 2 - Students who perceive their body mass as correct; Group 3 - Students who perceive their body mass as too high; Significantly different from group 1: \* $p < 0.05$ ; \*\*\* $p < 0.001$ ; ### Significantly ( $p < 0.001$ ) different from group 2;

**Table 2.** The frequency (%) of consuming the main meals of a day among surveyed female students

Meal	Group 2 (n = 697)	Group 3 (n = 202)
<b>Breakfast</b>		
Every day	75.0	66.3*
2-6 time/week	13.9	19.3*
Rarely	11.0	14.4*
<b>Lunch</b>		
Every day	53.4	43.6***
2-6 time/week	30.0	39.1***
Rarely	8.2	17.3***
<b>Supper</b>		
Every day	62.1	44.1***
2-6 time/week	25.2	34.2***
Rarely	12.6	21.8***
<b>Snack</b>		
Every day	57.4	50.5
2-6 time/week	21.1	21.1
Rarely	21.5	21.5

Legend: Group 2 - Students who perceive their body mass as correct; Group 3 - Students who perceive their body mass as too high  
Significantly different from group 1: \* $p < 0.05$ ; \*\*\* $p < 0.001$ .

**Table 3.** The frequency (%) of consuming specified foods among surveyed female students

Products	Group 2 (n = 697)	Group 3 (n = 202)
<b>White bread</b>		
Every day	49.6	35.2***
2-6 time/week	20.1	26.7***
Rarely	30.3	38.1***
<b>Whole grain bread</b>		
Every day	29.1	20.3*
2-6 time/week	29.3	33.2*
Rarely	41.6	46.5*
<b>Sweets</b>		
Every day	15.9	6.4***
2-6 time/week	38.4	33.7***
Rarely	45.6	59.9***
<b>Fruits</b>		
Every day	35.4	40.1
2-6 time/week	42.5	36.1
Rarely	22.1	23.7
<b>Vegetables</b>		
Every day	26.8	28.7
2-6 time/week	44.6	44.1
Rarely	28.6	27.2

For explanations of symbols see Table 2

Table 3 presents the consumption frequencies of selected food products such as those commonly considered as “fattening,” i.e. breads, sweets and soft drinks, and those recommended as weight-reducing, i.e. fruit, vegetables, and mineral water. The students who assessed their body mass as too high less frequently consumed breads, white bread in particular, and sweets. No differences were found regarding the frequencies of fruit and vegetable consumption (Table 3).

Students who overestimated their body mass drank higher amounts of liquids daily than those with the body mass assessed as correct (8.4 vs. 5.9 glasses;  $p < 0.001$ ). In the group that assessed their body mass as too high, a higher intake of water was observed (2.5 vs. 1.6 glasses;  $p < 0.05$ ), though with a lower intake of sweet and soft drinks (0.4 vs. 0.7;  $p < 0.05$ ). Among students who perceive their body mass as correct 24.1% declared participation in recreational activity twice a week, 39.0% – once a week and 36.9% rarely or never. Among students who perceive their body mass as too high the respective percentages were 23.8, 40.1 and 36.1%; the differences being non-significant. Moreover, no significant between-group differences were found with respect to declared smoking, on average about 17% of studied subjects declared that they smoke.

## Discussion

From this analysis, it emerged that the students made the assessment of how correct their body mass is by comparing themselves to the media-promoted “ideal figure” rather than to the WHO recommendations. BMI values above the population average, even if they fit within the norm, were regarded by surveyed students as too high. According to data published in subject literature, the incorrect self-assessment of body weight is commonplace among women [6,14]. Research carried out among university students in seven European countries, i.e. Bulgaria, Denmark, Spain, Lithuania, Germany, Poland and Turkey, shows that 20% of women with BMI equal to 20 kg/m<sup>2</sup> describe their own figure as “a bit too fat” or “too fat”; among women with BMI equal to 22.5 kg/m<sup>2</sup>, it soars to 60% [14]. This problem is also noticeable in younger age groups [8].

The relationship between the self-perception of body weight and nutritional behavior and recreational physical activity has been the subject of numerous analyses [1,10,12,17]. For overweight people, the underestimation of their body mass does not provide a positive impulse for taking up actions aimed at reducing it. Whereas for people with correct body mass, the overestimation may prompt the decision to go on a diet, oftentimes an incorrect

one or one that some doctors describe as “extreme.” It may cause nutritional deficiency and consequently electrolytic disorders, heart problems, sleep disorders, depression, lower self-esteem, delayed growth and puberty, and disturbed menstruation [3,7,15]. Long-term dieting may result in the development of eating disorders such as anorexia and bulimia [13].

In the surveyed group, a relationship between nutritional habits and the self-assessment of body mass has been determined. The perception of body mass as too high prompts undertaking activities aimed at reducing it, namely reducing the number of meals (mainly evening meals), reducing the intake of products regarded as fattening (breads, sweets), and increasing the amount of water drunk daily. This suggests that students who assess their body mass as too high undertake efforts towards losing weight following dieting guidelines found over the Internet. They simply try to eat less by limiting the number of meals daily, although with no attention paid to the quality of the diet. For example, the consumption of fruit and vegetables in the group is much lower than the recommended daily intake. Similar results were obtained in other studies out of which a disturbing fact has emerged: that when it comes to the control of body mass very often irrational actions (skipping meals, eliminating certain food-stuffs, and restrictive diets) win over rational actions (undertaking physical activity, balancing meal contents) [1,2,10,12,16,17]. Moreover, such behavior is frequently caused not by necessarily possessing excessive body mass in reality but by perceiving themselves as overweight.

Summing up, the obtained results indicate that misperception of weight status is common in young women. BMI values above population average, even if they fit within the norm, are regarded by the students as too high. Because self-perception of body mass is a key determinant of weight management and nutritional habits, many female students who are not overweight but who perceive themselves as such are likely to undertake efforts aimed at reducing body weight. This may lead to an increase in the prevalence of underweight. What is more, overestimation of body weight is associated with unhealthy eating behavior. These findings highlight the importance of appropriate dietary counseling and education in order to understand medical definitions of overweight for young women. There needs to be tailored strategies focused on preventing both extremes of BMI: overweight and underweight.

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**Received 20.08.2012**

**Accepted 10.10.2012**

The study was supported by the Polish Ministry of Science and Higher Education, grant number N N404 130936.

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