

## NUTRITIONAL BEHAVIOURS AND BODY SELF-PERCEPTION IN POLISH PUPILS ATTENDING MIDDLE-SCHOOL

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### ABSTRACT

**Background.** Adolescence is a vital part of child development, where acquired eating/dietary behaviour is often associated with ones' perception of body shape.

**Objectives.** To assess eating habits in relation to body shape perception and esteem in middle-school (junior-high) pupils.

**Materials and Methods.** Surveyed subjects were 170 middle-school pupils from Warsaw; 101 girls and 69 boys aged 15 years. An anonymous questionnaire was used to determine eating habits, body mass, growth and body shape perception. Anthropometric measurement cut-off points were taken according to the method of Cole et al.

**Results.** Only 29% of pupils ate 5 daily meals; of whom there were significantly more girls than boys (35% vs 20%,  $p = 0.042$ ). Girls more often consumed second breakfast than boys ( $p < 0.001$ ), whilst boys ate dinner more frequently than girls ( $p = 0.004$ ). Eating meals was observed in 86% all pupils, where sweets (71%) and fresh fruit (69%) were most commonly eaten. Boys ate fast-food more often than girls ( $p = 0.004$ ), as well as savoury snacks ( $p = 0.002$ ), sweets ( $p = 0.009$ ) and sweetened fizzy drinks ( $p < 0.001$ ). Girls however, consumed more low-fat foodstuffs compared to boys ( $p = 0.003$ ). Overweight was more common in boys than girls (26% vs 9%,  $p = 0.003$ ), whereas girls were more frequently malnourished than boys (21% vs 7%,  $p = 0.016$ ). Far fewer girls were satisfied with their body shape compared to boys (51% vs 94%,  $p < 0.001$ ). Girls also more commonly expressed a desire for slimming, despite either having a correct body mass or being underweight.

**Conclusions.** Many adverse and abnormal eating habits of pupils were found, especially in boys, that could lead to overweight and obesity. Subjects were found to incorrectly assess their body shape, particularly the girls, thereby leading to unwarranted slimming behaviour.

**Key words:** *nutritional habits, middle-school pupils, perceived body shape/image*

### STRESZCZENIE

**Wprowadzenie.** Okres dojrzewania jest ważnym etapem w rozwoju, w którym kształtują się zachowania żywieniowe często związane z postrzeganiem własnej sylwetki.

**Cel badań.** Celem pracy była ocena zachowań żywieniowych oraz postrzegania własnej sylwetki wśród młodzieży gimnazjalnej.

**Materiał i metody.** Badanie przeprowadzono wśród 170 gimnazjalistów z Warszawy (101 dziewcząt, 69 chłopców, wiek: 15 lat). Dane dotyczące zachowań żywieniowych, masy ciała, wzrostu oraz postrzegania własnego ciała zebrano za pomocą anonimowego kwestionariusza. Do oceny antropometrycznej badanej młodzieży wykorzystano wskaźnik Cole'a.

**Wyniki.** Jedynie 29% młodzieży, w tym więcej dziewcząt (35%) niż chłopców (20%,  $p=0,042$ ) spożywało codziennie pięć posiłków. Dziewczeta częściej niż chłopcy spożywały drugie śniadanie ( $p<0,001$ ), natomiast chłopcy częściej niż dziewczęta spożywali kolację ( $p=0,004$ ). Pojadanie między posiłkami deklarowało 86% gimnazjalistów. Między posiłkami młodzież najczęściej spożywała słodczyce (71%) oraz świeże owoce (69%). Chłopcy częściej niż dziewczęta spożywali produkty typu *fast-food* ( $p=0,004$ ), słone przekąski ( $p=0,002$ ), słodczyce ( $p=0,009$ ) oraz słodkie napoje gazowane ( $p<0,001$ ). Dziewczeta częściej niż chłopcy wybierały produkty o obniżonej zawartości tłuszczu ( $p=0,003$ ). Większy odsetek chłopców (26%) niż dziewcząt (9%) miał nadwagę ( $p=0,003$ ), natomiast u większej liczby dziewcząt (21%) niż chłopców (7%) stwierdzono niedożywienie ( $p=0,016$ ). Znacznie mniej dziewcząt (51%) niż chłopców (94%) było zadowolonych ze swojego wyglądu ( $p<0,001$ ). Dziewczeta często też deklarowały chęć schudnięcia, nawet mimo prawidłowej lub niedoborowej masy ciała.

**Wnioski.** W zachowaniach żywieniowych badanych gimnazjalistów zaobserwowano wiele nieprawidłowości mogących sprzyjać, zwłaszcza u chłopców, występowaniu nadwagi lub otyłości. Badana młodzież niewłaściwie oceniała własną sylwetkę, co zwłaszcza w przypadku dziewcząt, mogło prowadzić do nieuzasadnionego odchudzania.

**Słowa kluczowe:** *zachowania żywieniowe, gimnazjaliści, postrzeganie sylwetki*

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## INTRODUCTION

Adolescence is a time of turbulent change both in the body and for mental development. It is an important stage that shapes identity, value systems, attitudes and beliefs as well as health-related lifestyle behaviour such as eating habits and physical activity [16]. Abnormal nutritional behaviour leading to malnutrition or overweight may have disastrous consequences for the body, not only during development but also in later life. Assessing one's body shape correctly also plays a significant role. If errors are so made, this can then lead to abnormal eating habits which can be difficult to rectify. Because of the adverse health effects of abnormal nutrition, it seems that measures are required to assess the eating habits of youngsters whilst taking into account perceptions of their own body shape.

The study was thus focused on determining dietary habits along with body shape perception for pupils attending middle-school.

## MATERIALS AND METHODS

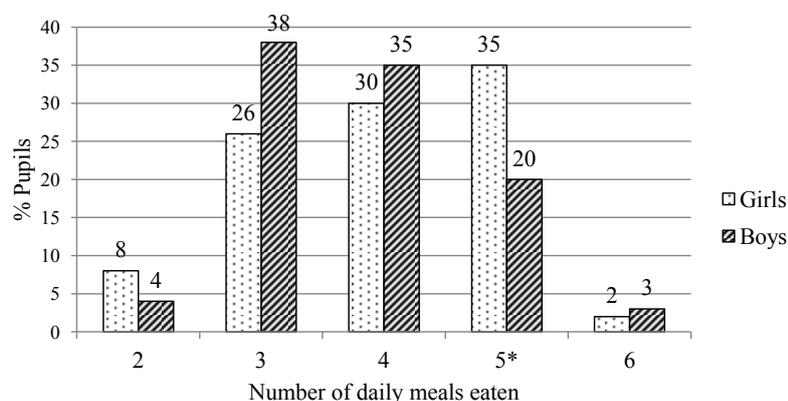
Study subjects consisted of 170 middle-school pupils, aged 15 years from Warsaw, surveyed in 2012 of whom 101 (60%) were girls and 69 (40%) boys. An anonymous questionnaire was used to determine the numbers of daily meals and how often they were eaten. Data was also recorded on the frequencies of snacking, consumption of selected foodstuffs, body mass, height and the desire for slimming. Furthermore, the 'Body Shape Questionnaire', Cooper et al. [2], was used to find out pupils' perceptions of their body shape, including taking care and satisfaction over their appearance. Questionnaire responses depended on entering in the number of times a particular behaviour occurred together with related feelings, such as being ashamed of one's appearance, thinking about body shape and avoiding social meetings because of being dissatisfied with one's body shape. The latter was done according to a scale ranging from 1 (never) to 6 (all

the time), where the sum points totals (all) were fitted into 4 defined categories regarding body appearance as follows; <80 - no concerns, 80 – 110 – mild concerns, 110 – 140 – moderate concerns and >140 significant concerns. Anthropometric assessments were conducted according to the methods of Cole et al. [3]. Subsequent statistical analyses were performed using the Statistica Ver. 10.0 package from Statsoft. Statistical differences between study groups were evaluated by the  $Chi^2$  test, adopting  $p \leq 0.05$  as showing significance.

## RESULTS AND DISCUSSION

Eating meals regularly and an appropriate foodstuff selection play significant roles for ensuring proper nutrition. Daily dietary intakes should be divided into 5 meals consumed at fixed times because irregular eating times may promote the accumulation of body fat. Our study has shown that only 29% of subjects ate the recommended 5 daily meals, of whom girls predominated over boys ( $p = 0.042$ ); Figure 1. The numbers eating 4 or 3 meals daily were similar; respectively at 32% and 31%. Other studies on adolescents have also demonstrated 3-4 meals being eaten daily [12, 15, 17, 19, 23]. In keeping with further studies [8, 18, 19, 24], the presented work has shown that the most common meal was lunch, whilst the least frequent was afternoon tea; daily consumptions of these meals being respectively 87% and 27% (Table 1).

Breakfast was daily eaten by 74% of all subjects, but never eaten at all by 11%. Other studies from Poland and abroad (Czech Republic, Norway, UK, Palestine) have found that breakfast consumption was even lower in adolescents, ranging from 45% to 70% [1, 2, 11, 13, 15, 18, 20], whilst those never eating breakfast ranged 13% to 29% [2, 15, 18, 20]; in the UK this was even up to 63%. Much more favourable findings by Wajszczyk et al. [23] and Stefanska et al. [19] however showed breakfast rates of 92 – 96%. Not eating breakfast may adversely



\* Significant differences between girls and boys,  $p < 0.05$

Figure 1. The number of daily meals consumed by middle-school pupil subjects

Table 1. Frequency of meals consumed by middle-school pupils, expressed as %

Meal	Consumption frequency												p
	Daily			Several times weekly			Several times monthly			Never			
	All	G	B	All	G	B	All	G	B	All	G	B	
Breakfast	74	75	74	10	9	12	5	7	1	11	9	13	ns
Second breakfast	59	66	48	16	20	10	7	7	7	18	7	35	<0.001
Lunch	87	85	88	10	11	9	2	2	3	1	2	0	ns
Afternoon tea	27	27	26	22	26	17	17	19	15	34	28	42	ns
Dinner	72	62	86	15	18	12	5	7	1	8	13	1	0.004

G – Girls, B – Boys, ns – No significant differences,  $p \geq 0.05$

affect learning, as low glucose blood levels result in lowered concentration, irritability and fatigue. In this respect, it is also advisable that youngsters eat second breakfast at school. The presented study showed that 59% subjects in fact ate this meal, with girls being higher than boys. Missing second breakfast by adolescents has been confirmed to be significant in other studies [8, 11, 18, 19, 20]. Norwegian studies by *Ilow et al.* [8] and *Stea et al.* [18] on youngsters observed that this meal was only eaten by 42 – 58% girls and 44 – 55% boys. Even lower results were seen by *Kurzak & Pawelec* [11] and *Szczepanska et al.* [20], with consumption levels of 29% and 39% by Polish middle-school pupils. Compared to our study, somewhat higher results were observed by *Szczepańska et al.* in Czech adolescents (61%) and by *Abudayya et al.* [1] for Palestinian youngsters (83% boys and 88% girls). The presented study demonstrated that decidedly more boys daily consumed dinner (86%) than girls (62%), whereas this meal was missed by only 8% of all subjects, of which 13% were girls and 1% boys. A study by *Marcysiak et al.* [13] recorded, in similar fashion, that that 9% of pupil subjects missed

their dinner. Other studies also confirmed that boys more often ate dinner [8, 18, 24].

Frequent snacking in between meals was observed in our study, to which 86% subjects admitted to, of whom 91% were boys and 83% girls. Some subjects, (15% girls and 10% boys) also declared they ate during nighttime. The most frequently snacked foodstuffs found, were sweets and fresh fruit (Figure 2), which agreed with other studies *Wajszczyk et al.* [23] and *Zimna-Walendzik et al.* [24]. A significantly lower number of Palestinian adolescents however snacked between meals; 21% boys and 21% girls. This study also showed that these findings were independent on the material status of subjects or the mothers' level of education [1]. The amount and kinds of foodstuffs eaten by youngsters between meals is particularly important, as consuming high calorie items such as sweets, significantly raises the calorific values of daily dietary intakes and may thus impact on being overweight. The consumption frequencies of selected foodstuffs (Table 2) demonstrate that youngsters often eat vitamin and mineral enriched products; 38% consuming these daily and 35% doing so

Table 2. Frequency of selected foodstuff products consumed by middle-school pupils, expressed as %

Foodstuff product type	Consumption frequency												p
	Daily			Several times weekly			Several times monthly			Never			
	All	G	B	All	G	B	All	G	B	All	G	B	
Vitamin and mineral enriched	38	40	36	35	39	30	13	12	14	14	9	20	ns
Fibre enriched	20	22	17	33	34	32	19	17	22	28	27	29	ns
Low sugar content	10	12	7	22	22	22	22	27	14	46	39	57	ns
Low fat content	10	14	4	18	19	16	23	30	14	49	37	66	0.003
Probiotics	14	14	14	18	22	14	15	16	14	53	48	58	ns
Fast food	7	2	14	3	2	6	28	23	35	62	73	45	0.004
Savoury snacks	18	15	23	9	4	18	30	32	26	43	49	33	0.002
Sweets and confectionery	34	33	33	36	28	49	17	23	9	13	16	9	0.009
Coffee	8	8	7	17	19	15	22	26	16	53	47	62	ns
Coffee substitute	8	7	8	10	10	12	12	12	12	70	71	68	ns
Tea	36	37	35	14	12	17	14	16	10	36	35	38	ns
Fruit juice	33	33	30	30	27	35	22	25	19	15	15	16	ns
Vegetable juice	4	4	4	5	5	6	19	17	22	72	74	68	ns
Mineral water	66	70	59	19	13	28	9	10	9	6	7	4	ns
Sweet sparkling drinks	17	12	25	28	16	45	30	36	20	25	36	10	<0.001

G – Girls, B – Boys, ns – No significant differences,  $p \geq 0.05$

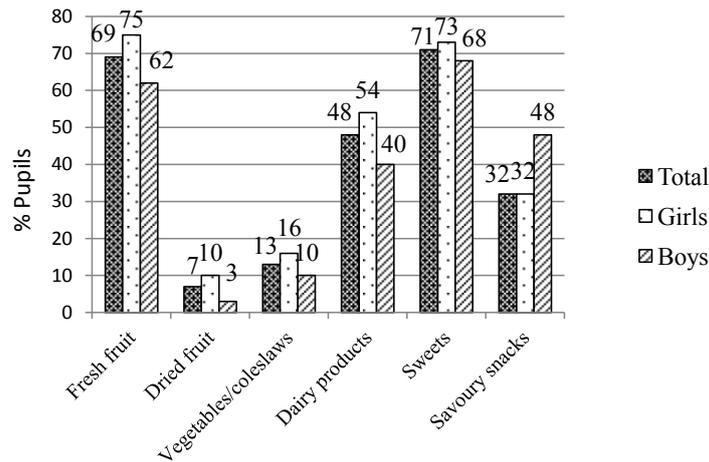


Figure 2. Foodstuffs consumed between meals by middle-school pupils

weekly. Regrettably, similar proportions of subjects do the same with sweets; 34% daily and 36% several times weekly. Those never eating sweets were overall 13%, but sweets were more often eaten by boys than girls. Daily consumptions of sweets recorded by other studies showed this to be 23 - 46% schoolchildren, but those never eating sweets were only 1 - 3% [13-16, 20, 21]. The current study showed that boys more often ate fast-foods compared to girls as well as savoury snacks such as crisps, savoury sticks, crackers, nuts. Girls however more frequently ate reduced fat foodstuffs than boys.

Mineral water was found to be the most popular beverage drunk by subjects, where 85% did so daily or several times weekly. This was also found to be the most common drink in a Bialystok study [12]. In contrast, a study by *Marcysiak et al.* [13] found that only 30% middle-school pupils drank mineral water. Our own study showed that more boys drank sweet fizzy (sparkling) drinks than girls, consistent with other studies [14, 16, 18]. The daily drinking of such beverages was admitted by 17% subjects in our study whereas 25% never did so at all. Other studies have observed 17-31% adolescents drinking sweetened drinks daily and 2-10% who never drank any [14, 16, 20].

Using the cut-off points from the method of *Cole et al.*, 15% of subjects were malnourished whilst 23% were overweight; with more girls than boys being malnourished and more boys than girls being overweight (Table 3). Girls were also much more likely to want to slim compared to boys (74% vs 23%,  $p < 0.001$ ). What is however worrying, is that most malnourished girls or those with a normal body mass wish to slim. Another area of concern, is that only a small proportion of overweight boys wanted to lose body mass. In keeping

Table 3. Body mass assessment and desire for slimming for middle-school pupils, expressed as %

Variable	All	Girls	Boys	p
Body mass assessment				
Malnourished	15	21	7	0.016
Normal body mass	62	66	57	ns
Overweight	16	9	26	0.003
Obese	7	4	10	ns
Pupils wanting to slim				
Malnourished	37	62	0	0.013
Normal body mass	53	75	21	<0.001
Overweight	62	89	22	0.001
Obese	83	100	57	ns

ns – No significant differences,  $p \geq 0.05$

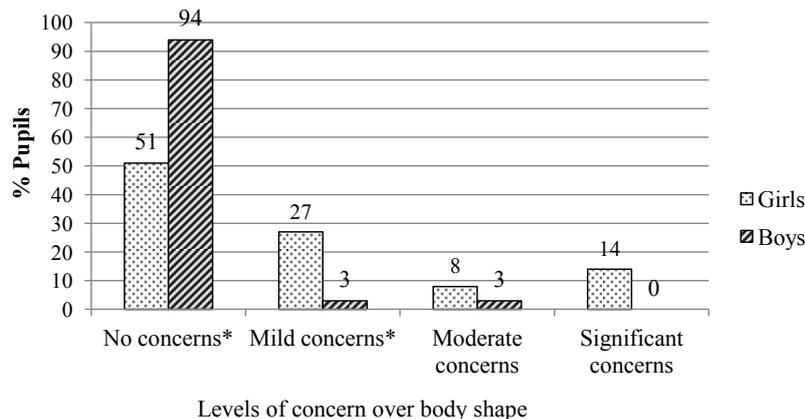


Figure 3. Levels of concern in middle-school pupils over body shape

with other studies [5, 9, 10, 13, 22], the presented work found that youngsters inadequately assessed their body shape according to their actual body mass. A study by *Fredrickson et al.* [7] on Australian children and one on Finnish teenagers, *Isomaa et al.* [9], demonstrated excess body mass in respectively 58% and 55% boys and 64% and 93% girls. Awareness of being overweight was observed in 89% obese boys and 75% obese girls as well as 42% overweight boys and 67% overweight girls in a study by *Czajka and Kochan* [5]. Those adolescents who were underweight or had normal body mass also showed poorly assessed body-shape, with 14-16% girls and 6-19% boys of normal body weight perceiving themselves to be overweight [5, 7, 9]. A study by *Josko and Kamecka-Krupa* [10] showed that 33% of underweight middle-school girls considered themselves to be somewhat overweight. In another study by *Tomaszewski et al.*, 53% of girls and 25% were dissatisfied with their body shape and up to 95% girls and 58% boys desired a body shape of mass below normal. Contrasting results were observed by *Fredrickson et al.* [7] where no underweight subjects considered themselves overweight. A similar finding was seen by *Isomaa et al.* [9] in boys; however only one underweight girl thought that she was overweight. Girls were found to be more bothered about their appearance than boys, where fewer girls (51%) compared to boys (94%) being satisfied,  $p < 0.001$  (Figure 3); this was observed in 52% cases of malnourished girls, 47% of normal weight and 56% and 50% of those that were respectively overweight or obese. However, not a single overweight boy expressed any concern

over their appearance (Table 4). Self-assessment of body shape has been studied by others [6, 9, 10, 22]. *Duncan et al.* [6], found a negative correlation between self-assessed body shapes with body fat in a group of British teenagers. Likewise to the presented work, these other studies showed that boys were more satisfied over their appearance. Furthermore, Black children more favourably assessed their looks than Asians, but there were no differences between White and Black children, or between white with Asian children [6].

## CONCLUSIONS

1. Dietary habits in middle-school pupils showed many abnormalities such as missing main meals, snacking in between meals, frequently eating sweets etc.
2. Boys tended to eat more high sugar and fat foodstuffs which may contribute towards becoming overweight and obese.
3. Pupil subjects incorrectly assessed their body shape, especially girls, which may lead to unwarranted slimming.
4. There is a need for adolescents to learn the principles of proper/adequate nutrition and about the role an appropriate body mass plays in keeping healthy.

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## Conflict of interest

*The authors declare no conflict of interest.*

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Table 4. Body self-perception according to nutritional status for middle-school pupils, expressed as %

Level of concern over body shape	All	Girls	Boys	p
Malnourished				
No concern	69	48	100	0.033
Mild concern	20	33	0	ns
Moderate concern	3	5	0	ns
Significant concern	8	14	0	ns
Normal body mass				
No concern	70	53	97	<0.001
Mild concern	16	24	3	0.004
Moderate concern	6	11	0	0.04
Significant concern	8	13	0	0.017
Overweight				
No concern	60	44	83	0.037
Mild concern	22	33	6	ns
Moderate concern	11	11	11	ns
Significant concern	7	12	0	ns
Obese				
No concern	70	50	100	0.039
Mild concern	15	25	0	ns
Moderate concern	0	0	0	-
Significant concern	15	25	0	ns

ns – No significant differences,  $p \geq 0.05$

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