

## EATING BEHAVIOURS OF MIDDLE- AND SECONDARY-SCHOOL PUPILS FROM THE UPPER SILESIAN REGION IN POLAND

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### ABSTRACT

**Background.** Eating behaviours of school-aged youth condition their emotional and psychophysical development. Moreover, they influence the effectiveness of learning and affect one's health and the quality of life at older age.

**Objective.** The objective of the study was the evaluation of eating behaviours of the group of pupils from cities of the Upper Silesian region, as well as the identification of differences between middle-school and secondary-school pupils' eating behaviours.

**Material and methods.** 902 pupils (474 middle-school and 428 secondary-school pupils) participated in the study. The research materials included questionnaires prepared by the author of the study, containing the questions about the pupils' eating habits.

**Results.** The middle-school pupils constituted 52.5% of the 902 pupils and the secondary-school pupils were 47.5% of the total. On average, 38.2% of the pupils consumed 4 meals daily. Wholemeal bread and/or groats were eaten daily by 34.4% of the pupils. Milk and/or milk drinks were consumed by 56.3% of the pupils every day and 33.5% of the respondents had also fermented milk drinks daily. 61.3% of the participants declared eating meat at least once a day and 44.9% of the pupils had fish once or twice a week. Vegetables and fruit were eaten daily by 61.4% and 66.6% of the pupils respectively. Sweets were consumed at least once a day by 50.6% of the pupils. Occasional consumption of fast-food products and ready-made meals was declared by 63.9% and 49.7% of the pupils respectively.

**Conclusions.** Eating behaviours of the discussed group of pupils are mostly incorrect. There were differences found between the middle-school and secondary-school pupils' eating habits. The differences concerned the frequency of eating cheese and curd cheese, fruit, leguminous plant seeds, sweets, fast food products, sweetened drinks and ready-to made food products.

**Key words:** *eating behaviours, eating habits, eating frequency, pupils*

### STRESZCZENIE

**Wprowadzenie.** Zachowania żywieniowe młodzieży szkolnej warunkują ich rozwój emocjonalny i psychofizyczny, dodatkowo wpływają na skuteczność procesów uczenia się, a także na stan zdrowia i jakość życia w wieku starszym.

**Cel.** Celem badań była ocena zachowań żywieniowych uczniów szkół gimnazjalnych i licealnych z wybranych miast Górnego Śląska oraz identyfikacja różnic pomiędzy ich zachowaniami żywieniowymi.

**Materiał i metody.** Badaniami objęto 902 uczniów, w tym 474 uczęszczających do szkół gimnazjalnych i 428 do szkół licealnych. Materiał do badań stanowiły autorskie kwestionariusze ankiety zawierające pytania badające zachowania żywieniowe badanych uczniów.

**Wyniki.** Spośród 902 badanych uczniów gimnazjalni stanowili 52,5%, a licealiści 47,5%. Średnio 38,2% uczniów spożywało 4 posiłki dziennie. Pieczywo pełnoziarniste i/lub kasze codziennie spożywało 34,4% badanych. 56,3% codziennie piło mleko i/lub napoje mleczne, a 33,5% napoje mleczne fermentowane. Spożywanie mięsa i/lub wędlin, co najmniej raz dziennie deklarowało 61,3%, natomiast ryb 1-2 razy w tygodniu 44,9% uczniów, a warzywa codziennie jadło 61,4%, a owoce 66,6% badanych uczniów. Słodycze, co najmniej raz dziennie spożywało 50,6% uczniów. Okazjonalne spożywanie produktów „fast-food” deklarowało 63,9%, a gotowych produktów 49,7% badanych.

**Wnioski.** Zachowania żywieniowe badanej grupy uczniów były w większości nieprawidłowe. Stwierdzono występowanie różnic pomiędzy zachowaniami żywieniowymi uczniów szkół gimnazjalnych i licealnych. Różnice te dotyczyły częstości spożywania serów twarogowych i żółtych, owoców, nasion roślin strączkowych, słodczy, produktów typu „fast-food”, napojów słodzonych, a także produktów i dań gotowych.

**Słowa kluczowe:** *zachowania żywieniowe, nawyki żywieniowe, częstość spożycia, młodzież szkolna*

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## INTRODUCTION

Diet has significant influence on psychic, somatic and physical development and it affects health and the quality of life. Children and youth constitute the group which is particularly liable to the consequences of improper eating behaviours leading to disturbances in the mental and physical development including chronic diseases. [5, 8, 13, 14, 20]. This makes their prevention a priority for public healthcare and thus requires governments, communities and international society to rescue their engagement in the promotion of healthy diet and physical activity [1].

School-aged youth is a group characterised by intensive pace of living resulting from studying duties and extracurricular activities as well as particular susceptibility to media, which very often promote false or incomplete information concerning nutrition [16]. Skipping meals or their irregular consumption, low diversity of food products and dishes, low nutritional value diet (e.g. fast food products, sweets, sweetened drinks), but also insufficient intake of whole grain cereal products, fish, vegetables and fruit, are the most common in this particular group of people [3, 5, 14, 20].

Young age is the best time for dietary education as it is characterised by the ability to learn quickly and introduce changes easily. World Health Organisation remarks that achieving success within the scope of activities regarding healthcare and young generation development is possible by decreasing inequalities in health, developing resources and eliminating health risk factors [1]. The effects of such an investment should be observable in the future population's health condition, especially that the present state of the Polish society's knowledge is far from sufficient and it has not improved much in the recent years [1, 21].

The objective of the study was the evaluation of eating behaviours of the group of school pupils from the Upper Silesian region in Poland and the identification of differences between middle-school and secondary-school pupils' eating behaviours.

## MATERIAL AND METHODS

902 pupils participated in the study (474 middle-school pupils and 428 secondary-school pupils) from the Upper Silesian region in Poland. The study was conducted in spring 2013. The questionnaire developed by the author, consisted of the respondent's particulars part and the questions part concerning the respondent's eating habits, the frequency of particular food groups' consumption within the last 30 days as well as self-assessment regarding one's diet. The objective of pilot

study including 20 people was to verify whether the questions were comprehensible for pupils. The data was gathered in Microsoft Office Excel 2007 worksheet. The statistical analysis was done with the use of StatSoft, Inc. Statistica version 10.0. To compare the frequency of particular food products consumption by middle-school and secondary-school pupils Chi-squared test was applied. The value of statistical significance was  $p \leq 0.05$ .

## RESULTS

### *Group profile*

The middle-school pupils constituted 52.5% of the total number of pupils and the secondary-school ones were 47.5% of the respondents. The questionnaire was filled in by 517 girls (57.3%) and 385 boys (42.7%). The average age of the middle-school pupils was  $14.5 \pm 0.6$  years old and for the secondary-school pupils the average age was  $17.4 \pm 0.8$  years old. 44.3% of the pupils stated that they had one brother or sister. Most often the pupils spent 6-8 lesson units at school- such an answer was given by 89.4% of the respondents (Table 1).

Table 1. Group profile

	Feature	n = 902	%
School grade	middle-school	474	52.5
	secondary-school	428	47.5
Sex	girls	517	57.3
	boys	385	42.7
Age	13-15 years old	381	42.2
	16-18 years old	483	53.6
	more than 18 years old	38	4.2
Having siblings*	absence	222	25.4
	1	388	44.3
	2 or more	265	30.3
Applying the dietary supplement	yes	201	22.3
	no	701	77.7
Number of hours spent in school	less than 6 lesson units	18	2.0
	6-8 lesson units	806	89.4
	more than 8 lesson units	78	8.6

\*n=875

### *Eating behaviours of the subject group*

The pupils most frequently stated they consumed 4 meals daily (38.2%), the middle-school pupils (37.1%) and secondary-school pupils (39.4%). 19.5% of the respondents 5 meals a day, with the majority of them being the secondary-school pupils (22.5%) compared to the middle-school pupils (16.7%) (Figure 1).

56.7% of the pupils had breakfast within 30 minutes from waking up 57.4% for the middle-school pupils and 55.9% secondary-school pupils. As much as 14.1% of the respondents, including 14.3% of the middle-school pupils and 13.8% of the secondary-school pupils, did not have breakfast at all (Figure 2).

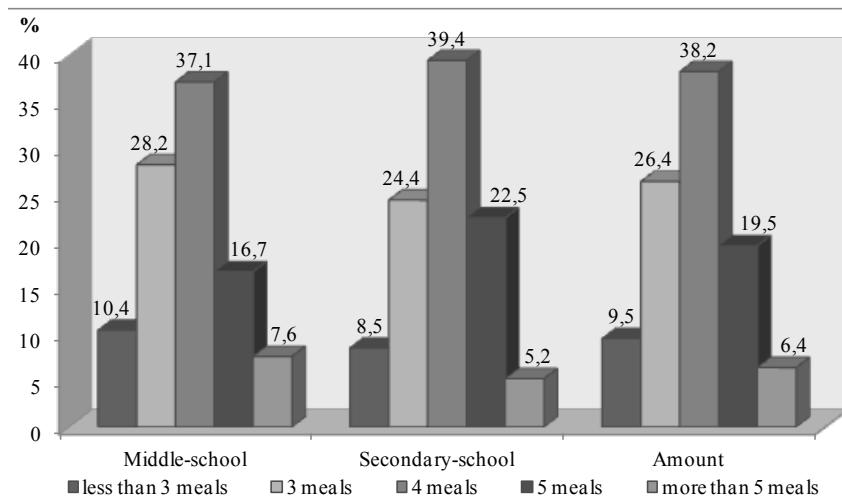


Figure 1. Number of meals consumed daily

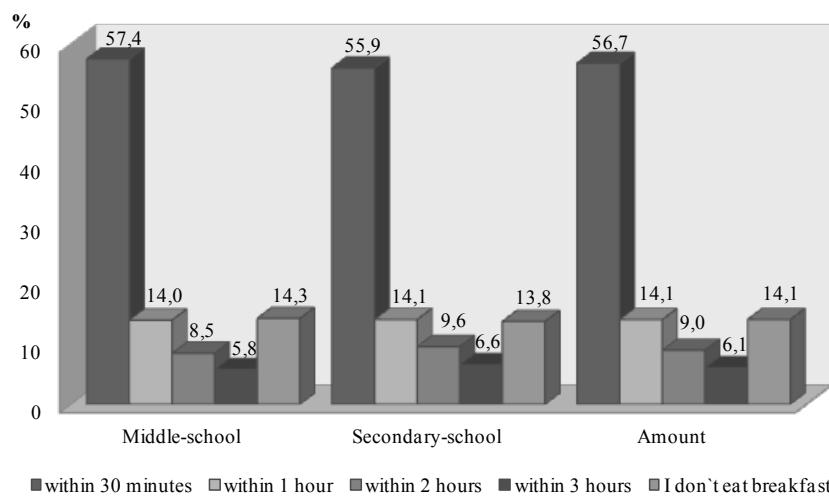


Figure 2 Answers to the question "How long after waking up do you have breakfast?"

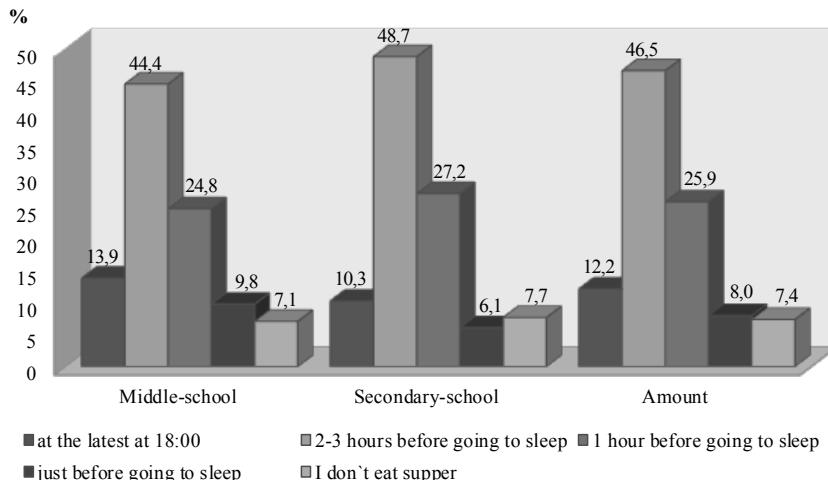


Figure 3. Answers to the question: "How long before going to sleep do you have your supper?"

46.5% of the pupils had their supper 2-3 hours before going to sleep, with the percentage being lower for the middle-school pupils (44.4%) compared to the secondary-school pupils (48.7%). Moreover, 7.4% of the respondents did not have their supper at all. Such an

answer was given by 7.1% of the middle-school pupils and 7.7% of the secondary-school pupils (Figure 3).

Wholemeal bread and/or groats were eaten daily by 34.4% of the pupils. Milk and/or milk drinks were consumed by 56.3% of the pupils every day and 33.5%

of the respondents had also fermented milk drinks daily. 61.3% of the participants declared eating meat at least once a day and 44.9% of the pupils had fish once or twice a week. Vegetables and fruit were eaten daily by 61.4% and 66.6% of the pupils respectively. Sweets were consumed at least once a day by 50.6% of the pupils. Occasional consumption of fast-food products and ready-made meals was declared by 63.9% and 49.7% of the pupils respectively.

The detailed consumption patterns are presented in Table 2, 3 and 4.

The consumption frequency analysis showed statistically significant differences between the middle-school pupils and secondary-school pupils regarding curd cheese ( $p=0.04$ ) and cheese ( $p<0.01$ ) (Table 2), fruit ( $p=0.02$ ) and leguminous plant seeds ( $p<0.01$ ) (Table 3), sweets ( $p<0.01$ ), fast food products ( $p<0.01$ ), sweetened drinks ( $p<0.01$ ), ready-made products and dishes ( $p<0.01$ ) (Table 4).

The analysis of the obtained data showed that 77.4% of the respondents were aware that their diets significantly influenced their health. Such an answer

Table 2 Comparison of the frequency of consuming wholemeal bread and products rich in proteins

Food product groups	Possible responses	Middle-school pupils		Secondary- school pupils		p*
		n=474	%	n=428	%	
Wholemeal bread and/or groats	a few times a day	79	16.7	83	19.4	0.36
	once a day	81	17.1	67	15.7	
	3-4 times weekly	71	15.0	74	17.3	
	1-2 times weekly	89	18.7	75	17.5	
	occasionally	119	25.1	110	25.7	
	not at all	35	7.4	19	4.4	
Milk and/or milk drinks (eg. cocoa, chicory coffee)	a few times a day	121	25.5	86	20.1	0.34
	once a day	156	32.9	145	33.8	
	3-4 times weekly	84	17.7	83	19.4	
	1-2 times weekly	51	10.8	59	13.8	
	occasionally	42	8.9	41	9.6	
	not at all	20	4.2	14	3.3	
Fermented milk drinks (eg. yogurt)	a few times a day	65	13.8	37	8.6	0.1
	once a day	104	21.9	96	22.4	
	3-4 times weekly	132	27.8	114	26.6	
	1-2 times weekly	78	16.5	93	21.8	
	occasionally	74	15.6	64	15.0	
	not at all	21	4.4	24	5.6	
Curd cheese	a few times a day	32	6.8	19	4.4	0.04
	once a day	62	13.1	56	13.1	
	3-4 times weekly	109	23.0	96	22.4	
	1-2 times weekly	119	25.1	133	31.1	
	occasionally	105	22.2	101	23.6	
	not at all	47	9.8	23	5.4	
Cheese and/or processed cheese	a few times a day	76	16.0	43	10.0	<0.01
	once a day	127	26.8	94	22.0	
	3-4 times weekly	126	26.6	156	36.4	
	1-2 times weekly	67	14.1	82	19.2	
	occasionally	53	11.2	34	7.9	
	not at all	25	5.3	19	4.5	
Meat and/or cold meat	a few times a day	162	34.2	127	29.7	0.44
	once a day	129	27.2	135	31.5	
	3-4 times weekly	119	25.1	112	26.2	
	1-2 times weekly	28	5.9	26	6.1	
	occasionally	15	3.2	16	3.7	
	not at all	21	4.4	12	2.8	
Fish	a few times a day	6	1.2	1	0.2	0.07
	once a day	19	4.0	9	2.2	
	3-4 times weekly	52	11.0	46	10.7	
	1-2 times weekly	197	41.6	208	48.6	
	occasionally	165	34.8	142	33.2	
	not at all	35	7.4	22	5.1	

\* Chi<sup>2</sup> test

Table 3 Comparison of fruits and vegetables consumption frequency.

Food product groups consumed	Possible responses	Middle-school		Secondary-school		p*
		n=474	%	n=428	%	
Vegetables	a few times a day	147	31.0	121	28.3	0.79
	once a day	151	31.9	135	31.5	
	3-4 times weekly	89	18.8	109	25.5	
	1-2 times weekly	43	9.1	40	9.3	
	occasionally	30	6.2	15	3.5	
	not at all	14	3.0	8	1.9	
Fruits	a few times a day	201	42.4	135	31.6	0.02
	once a day	132	27.8	132	30.8	
	3-4 times weekly	90	19.0	102	23.8	
	1-2 times weekly	27	5.7	37	8.6	
	occasionally	19	4.0	16	3.8	
	not at all	5	1.1	6	1.4	
Bean, pea, soya	a few times a day	8	1.7	2	0.5	<0.01
	once a day	19	4.0	7	1.6	
	3-4 times weekly	45	9.5	26	6.1	
	1-2 times weekly	92	19.4	79	18.5	
	occasionally	210	44.3	235	54.9	
	not at all	100	21.1	79	18.4	

\* Chi<sup>2</sup> test

Table 4 Comparison of the frequency of consuming sweets, fast food products, ready-made products/ meals and sweetened drinks.

Food product groups consumed	Possible responses	Middle-school		Secondary-school		p*
		n=474	%	n=428	%	
Sweets	a few times a day	148	31.2	77	18.0	<0.01
	once a day	108	22.8	124	29.0	
	3-4 times weekly	98	20.7	102	23.8	
	1-2 times weekly	51	10.8	59	13.8	
	occasionally	61	12.9	57	13.3	
	not at all	8	1.6	9	2.1	
Fast-food products	a few times a day	19	4.0	6	1.3	<0.01
	once a day	15	3.2	8	1.9	
	3-4 times weekly	28	5.8	15	3.5	
	1-2 times weekly	78	16.5	69	16.1	
	occasionally	301	63.5	275	64.3	
	not at all	33	7.0	55	12.9	
Sweetened drinks	a few times a day	71	15.0	34	7.9	<0.01
	once a day	54	11.4	43	10.0	
	3-4 times weekly	82	17.3	62	14.6	
	1-2 times weekly	90	19.0	65	15.2	
	occasionally	150	31.6	173	40.4	
	not at all	27	5.7	51	11.9	
Ready-to use products	a few times a day	18	3.8	0	0.0	<0.01
	once a day	6	1.3	4	0.9	
	3-4 times weekly	32	6.8	12	2.8	
	1-2 times weekly	74	15.6	41	9.6	
	occasionally	212	44.7	236	55.2	
	not at all	132	27.8	135	31.5	

\* Chi<sup>2</sup> test

was chosen more frequently by the secondary-school pupils (80.1%) than the middle school pupils (74.9%) (Figure 4).

The results of the data analysis show that 60.9% of the pupils evaluating their own eating behaviours

admitted that they made minor nutritional mistakes (similar percentage of the middle-school and secondary-school pupils, while 24.8% considered their diets proper (higher percentage of middle-school pupils than the secondary-school pupils) (Figure 5).

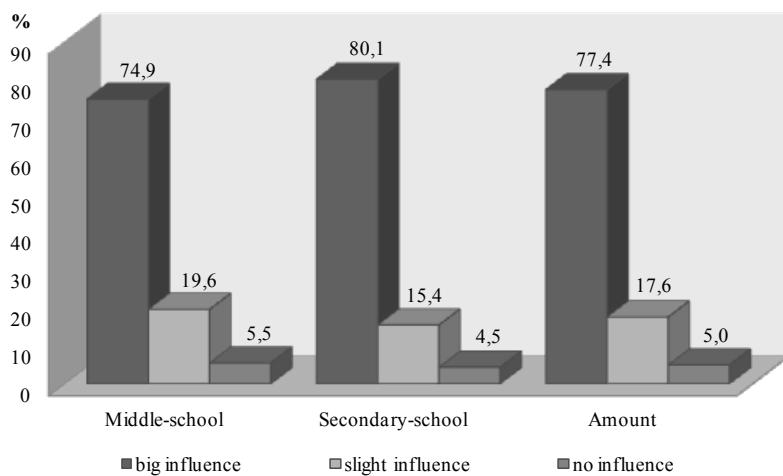


Figure 4. Answers to the question: "Do you think that your diet influences on your health?"

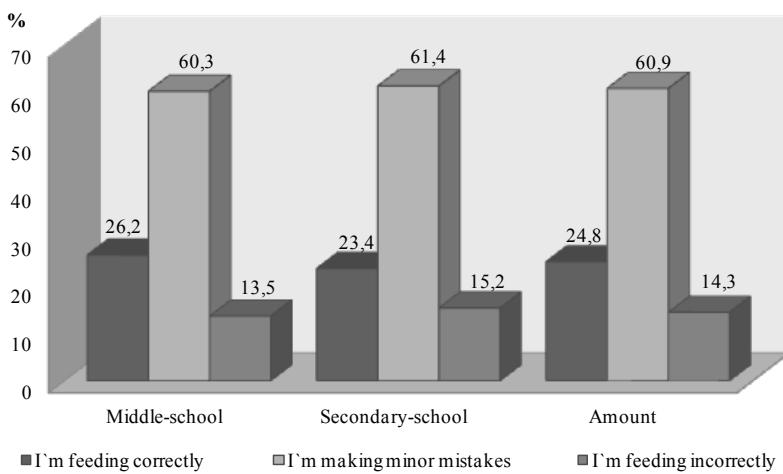


Figure 5. Answers to the question: „How do you evaluate your diet?”

## DISCUSSION

One of the main criteria for eating behaviours assessment is the number of meals eaten daily. According to the principles of well-balanced nutrition worked out by the National Food and Nutrition Institute (Warsaw, Poland) in 2009, children and youth should consume 4-5, but optimally 5 meals a day [12]. The results of the study showed that the respondents most frequently had 4 (38.2%) or 3 meals a day (26.4% of the pupils). Similar results were obtained by Gajda and Jeżewska-Zychowicz, who showed that the majority of the pupils who participated in their studies declared having 4 meals a day (36.2% of the respondents) and 25.4% of the pupils had 3 meals a day [6]. Similar data was presented by Sitko et al., who assessed eating behaviours of middle-school and secondary-school pupils from Warsaw (Poland) [14]. According to the authors both the middle-school and secondary-school pupils most frequently had 3-4 meals a day (68% and 70% of the pupils respectively).

Breakfast is a significant element of proper eating behaviours. According to the results of the study ana-

lysis, the respondents most often had their breakfast within 30 minutes from waking up, as declared by 56.7% of them. What seems worrisome, is the fact that as much as 14.1% of the respondents did not have breakfast at all. Similarly alarming results were obtained by Ziolkowska et al. while evaluating the eating habits of middle-school pupils from Warsaw and nearby areas (Poland). Their study showed that 11.6% of the respondents did not have breakfast at all [22]. Szczepańska et al., who compared eating habits of the youth living near Polish-Czech borderline, showed that 13% of Polish and 16% of Czech youth never had breakfast [16]. Skipping breakfast is a very frequent nutritional mistake made by young people, which was proved also in other authors' studies [7, 8, 17].

According to the principles of well-balanced nutrition, the source of energy in children and youth's diet should be grain products, including most of all whole-meal bread and/or groats, which ought to be consumed several times a day [12]. The author's study showed that the respondents ate those products occasionally with only 8% of them having them several times a day.

Milk and milk products should be a regular element of one's everyday diet. Not only are they the main source

of calcium, but also deliver protein of high biological value, vitamins from groups B, A and D as well as minerals such as magnesium, potassium and zinc [12]. The analysis of the author's study results showed that milk and/or milk products were consumed by 56.3% of the pupils every day, fermented milk drinks by 33.5%, curd cheese was consumed daily by 18.8% and cheese or processed cheese were eaten everyday by 37.7% of the respondents. Different results were obtained by *Szczepańska et al.* In their studies milk was drunk everyday by only 14% of the pupils, fermented milk drinks by 22% and curd cheese was consumed daily by 9% of the pupils, 20% of the pupils had cheese and processed cheese daily [15]. However, *Mensink et al.*, who assessed the consumption frequency of particular products in a group of German youth aged 11-17, showed that only half of the respondents consumed milk everyday [10]. Similarly low milk and milk products consumption was observed by *Ortiz-Hernandez and Gomez-Tello* [11].

The analysis of the obtained results showed that 44.9% of the respondents had fish 1-2 times a week. In *Bortnowska et al.* studies concerning fish consumption by school-aged people as much as 50% of the respondents ate fish hardly ever or never and 27.6% had fish rarely [2].

Another principle of well-balanced nutrition is the consumption of fresh fruit and vegetables several times a day. Eating fruit a few times a day was declared by 42.2% of the middle-school pupils and 31.6% of the secondary-school pupils, having vegetables daily was declared by 31% and 28.3% of the respondents respectively. Similar results were obtained by *Świderska-Kopacz et al.* in their study on middle-school pupils' health behaviours, where 41.7% of the respondents had fresh fruit and 28.9% had fresh vegetables daily [18]. Other authors also point in their studies to insufficient consumption of fruit and vegetables [7, 16].

The results of the study indicate improper eating behaviours among the pupils regarding sweets and sweetened drinks consumption. Similar results were obtained by *Urbańska* and *Czarniecka-Skubina* [19], *Szczepańska et al.* [16].

The analysis of the study results showed that 77.4% of the pupils, including 74.9% of the middle-school pupils and 80.1% of the secondary-school pupils, agree that eating behaviours influence health. *Świderska-Kopacz et al.*, who study youth eating behaviours, also acknowledge that most of the middle-school pupils are convinced about the influence of one's eating habits on their health [18]. During self-assessment of one's eating behaviours, 60.9% of the respondents admitted that they made minor nutritional mistakes and 24.8% considered their eating behaviours to be proper. *Czarniecka-Skubina* and *Namysław* [4] as well as *Maksymowicz-Jaroszuk* and *Karczewski* [9] obtained slightly different results,

which showed that 36.7% of the secondary-school pupils and 70% of the middle-school pupils described their eating behaviours as correct.

## CONCLUSIONS

1. Eating behaviours of the analysed group of pupils are mostly improper.
2. The differences between eating behaviours of the middle-school and secondary-school pupils were found. It concern the frequency of eating cheese and curd cheese, fruit, leguminous plant seeds, sweets, fast-food products, sweetened drinks and ready-made meals.

## Conflict of interest

*The authors declare no conflict of interest.*

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