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Preferencje żywieniowe dzieci tarnowskich szkół podstawowych w kontekście występowania otyłości

Food Preferences of Tarnów Primary School Children in the Context of the Occurrence of Obesity

Streszczenie

Wstęp: Problem otyłości dotyczy nie tylko dorosłych, ale także dzieci i młodzieży. Stanowi jedno z najczęstszych zaburzeń rozwojowych wśród dzieci. Nadmierną masę ciała posiada około 20% dzieci, natomiast jedną trzecią z tej grupy stanowią dzieci otyłe. Celem pracy była ocena występowania problemu otyłości wśród dzieci klas 5-6 szkoły podstawowej oraz poznanie wiedzy na temat prawidłowych zasad żywieniowych dzieci.

Materiał i metody: Do przeprowadzenia badań wykorzystano ankietę skierowaną do dzieci. Pytania dotyczyły sposobu odżywiania dziecka oraz sprawdzały wiedzę na temat zdrowego odżywiania. W trakcie badań wykonano pomiary antropometryczne, obliczono wskaźnik Body Mass Index (BMI) oraz wskaźnik Cole'a. Badania przeprowadzono w dniach od 1 września do 30 października 2014 roku, wśród 400 dzieci uczęszczających do klas 5-6, w 8 szkołach podstawowych w Tarnowie.

Wyniki: W wyniku analizy stwierdzono, że chłopcy w porównaniu do dziewczynek statystycznie istotnie częściej spożywali warzywa 1 x tygodniu (p<0,001). Sposób odżywiania dzieci ma wpływ na ich rozwój fizyczny, w tym na masę ciała. Największa zanotowana masa ciała wynosiła 93 kg, natomiast najniższa 23,7 kg. Maksymalna różnica pomiędzy masą ciała poszczególnych dzieci wyniosła 69,3 kg. Największa wartość wskaźnika BMI wyniosła 39,21, natomiast najmniejszy wskaźnik BMI wyniósł 13,06.

Wnioski: Poziom wiedzy na temat zdrowego stylu życia wśród ankietowanych dzieci nie jest wystarczający do utrzymania prawidłowej masy ciała. Respondenci najczęściej podjadają pomiędzy posiłkami słodycze, ciastka, chipsy oraz piją słodkie napoje gazowane. Należałoby zastąpić wymienione produkty warzywami i owocami oraz naturalnymi sokami.

Słowa kluczowe: odżywianie, dzieci, otyłość, zachowania zdrowotne

Abstract

Introduction: The problem of obesity concerns not only adults but also children and teenagers. It is one of the most frequent developmental disorders among children. Around 20% of children have excessive body mass, and one-third of this group are obese children. The aim of the study was the assessment of the occurrence of obesity among 5th-6th graders of primary school and check children's knowledge about proper nutrition principles.

Material and methods: The method of diagnostic survey was used a questionnaire addressed to children. The questions concerned the child's diet and checked the knowledge about healthy diet. In the course of the research anthropometric measurements were taken, the Body Mass Index (BMI), as well as Cole index were calculated. The survey was conducted from 1 September to 30 October 2014, among 400 children attending the 5th and 6th grade, in 8 primary schools in Tarnów.

Results: As a result of the analysis it was found out that boys in comparison with girls statistically significantly more frequently ate vegetables once a week (p<0.001). Children's diet influences their physical development, including body mass. The biggest observed body mass was 93 cm, and the smallest was 23.7 kg. The maximum difference between the body mass of individual children was 69.3 kg. The biggest value of BMI was 39.21, whereas the lowest BMI was 13.06.

Conclusions: The level of knowledge about healthy lifestyle among the surveyed

children is not sufficient to keep the proper body mass. The respondents most often snack sweets, cakes, crisps and sweet fizzy drinks between meals. The mentioned product should be replaced by vegetables, fruit and natural juices.
Keywords: diet, children, obesity, health behaviours

Introduction

Obesity is a huge epidemiological problem of the 21st century. The problem of obesity occurs more and more often both in highly developed and developing countries by way of civilisation progress. In numerous countries, including Poland, obesity has taken on epidemic proportions, constituting a serious problem for public health and contemporary society [1, 2].

The problem of obesity concerns not only adults but also children and teenagers. It is one of the most frequent developmental disorders among children. Around 20% of children have excessive body mass, and one-third of this group are obese children. As many as 155 million of schoolchildren are affected by the problem of overweight and obesity. Of this group as many as 30-45 million children and teenagers aged 5-17 are overweight or obese. The number of obese children under 5 years of age is 22 million. The number of children and teenagers with excessive body mass in Poland in the last 20 year ranges between 2.5-12%. Considering the above data we can claim that we are facing a serious health problem which is an increase in the "epidemics" of obesity in the world [2, 3].

What greatly contributes to the growth of the obesity problem is improper lifestyle. Modifiable environmental factors play an important role in the development of overweight and obesity, over 60%. The intake of high calorie, processed food with low nutrient value in the amounts exceeding the energy requirements of the body greatly contributes to the intensity of the obesity scourge. Positive energy balance, improper eating habits and recently decreasing physical activity of population significantly influence the rise in the obesity problem [4]. Genetic predispositions also contribute to the occurrence of obesity [4, 5]. In obesity prevention, a significant role is played by environmental factors which include lifestyle and health behaviours. These are factors which are subject to modification by means of preventive activities and actions promoting health [5].

The main objective of the study was the assessment of the occurrence of obesity among 5th-6th graders of primary school and check children's knowledge about proper nutrition principles.

Material and methods

The method of diagnostic survey was used to conduct the research, and a survey directed to children was used as a research technique. The questions concerned the child's diet (the frequency of eating main meals and individual products), as well as questions checking the knowledge about healthy diet (the main sources of proteins and fats and products recommended in everyday diet) were asked. In the course of the research anthropometric measurements were taken, the Body Mass Index (BMI), BMI centile, body mass centile and height centile, as well as Cole index were calculated. While taking the measurements, the principles of earlier preparation of children for taking them were observed.

The survey was conducted from 1 September to 30 October 2014, among 400 children attending the 5th and 6th grade, in 8 primary schools in Tarnów. Before performing the survey, the written consent of the parents and school headmasters to perform it, as well as the consent of the bioethics committee at Medical Chambers in Tarnów were obtained. The statistical analysis was performed with the use of the Statistica 7.1 software. For all statistical calculations, the level of significance "p" was adopted, not exceeding the value of 0.05.

Results

The number of respondents from individual grades shaped on an equal level - 51% were children from the 5th grade and 49% from the 6th grade. Among the respondents 45% were boys and 55% were girls. A great majority of the respondents (87%) ate lunch at school. Only 13% declared that they do not eat lunch. The children eating lunch brought it mainly from home (81%). 17% of the respondents bought it in the school shop, and 2% bought it in a shop on the way to school.

More than half of the survey participants (74%) ate dinner every day, and 10% had it 5-6 times a week. Only 2% of the pupils claimed that they never eat dinner. Supper was eaten every day by 58% of the respondents, and 5-6 times a week by 17%.

Only 3% never ate supper. Statistically, the frequency of eating individual meals did not differ significantly in terms of sex of the surveyed children, or between the sex and the grades which the children attended.

In the opinion of more than half of the respondents (66%) children should eat 4 to 5 meals a day, 26% thought that 3 meals are enough. On the other hand, 3% of the respondents said that schoolchildren should consume 1-2 meals daily (Figure 1).

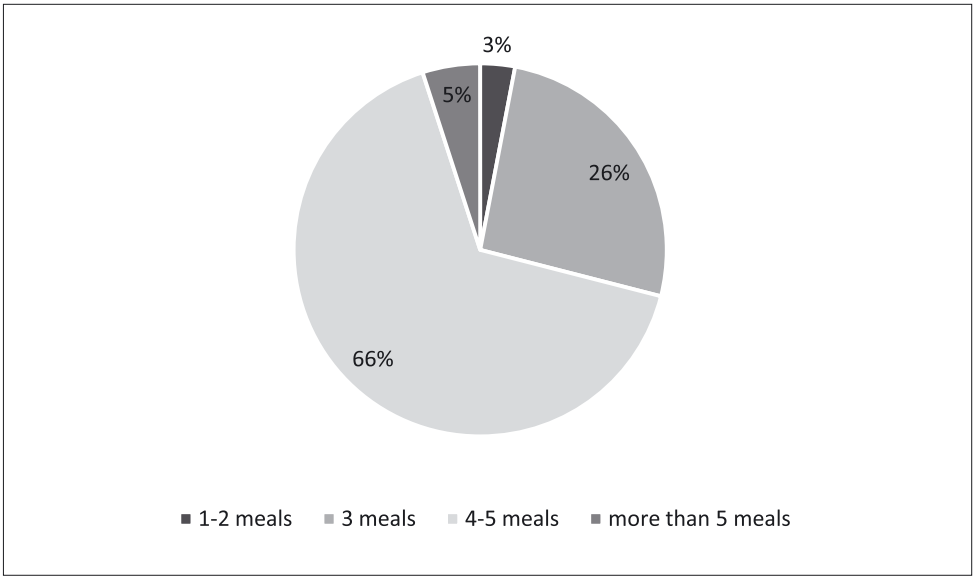

Figure 1. How many meals a day should children at your age eat?

The knowledge about the number of meals which children should eat during the day did not differ statistically significantly between the sex of the respondents and between the grades of the surveyed children.

A great majority of children (83%) sometimes bought something to eat, 9% did it frequently, and 8% of the respondents never did it. Out of the presented products, the following were eaten or drunk usually every day: water (65%), milk and milk products (46%), as well as fruit (39%) and vegetables (35%). The survey participants consumed: fruit (47%), sweets (44%) and Coca-Cola (24%) a few times a week. Products the respondents ate usually once a week are: fish (34%) and salty snacks (30%). Brown bread was most often chosen by the respondents as eaten less frequently than once a week (34%) (Table 1).

Table 1.
How often do you eat or drink the presented products

Products	Every day	A few times a week	Once a week	More seldom	Never
Fruit	39%	47%	6%	7%	1%
Vegetables	35%	39%	9%	15%	2%
Sweets (candies, chocolate)	15%	44%	19%	20%	2%
Coca – Cola o other sweet drinks	9%	24%	18%	38%	11%
Water (mineral, spring water)	65%	21%	5%	6%	3%
Milk or milk products (cheeses, yoghurts, kefir)	46%	43%	6%	4%	1%
Fish	3%	14%	34%	40%	9%
Brown bread	18%	21%	13%	34%	14%
Salty snacks (crisps, salty sticks, crackers)	5%	22%	30%	38%	5%

As a result of the analysis it was found out that boys in comparison with girls statistically significantly more frequently ate vegetables once a week ($p<0.001$). It was also discovered that 6th graders statistically significantly more frequently ate vegetables and sweets in comparison with the 5th grade pupils ($p=0.035$).

The children assessed the composition of the products eaten every day. In the opinion of the respondents the biggest amount of protein is included in milk, yoghurts and cheese (63%), then meat was indicated (18%). Only 1% thought that protein is included in cereal products (Figure 2).

The knowledge about products which are the source of proteins did not differ significantly between the child's sex, but it differed significantly between the grades. Statistically significantly more often, the 5th grade pupils indicated meat as the main source of proteins in comparison with the 6th grade pupils ($p=0.026$).

According to the respondents, the biggest amount of healthiest fats can be found in fish (71%). Olive oil was on the second position (17%). Lard was pointed by 2% of the respondents. The knowledge about products which are the source of fat did not differ significantly between the child's sex and between the grades of the survey participants. The respondents indicated that the following products should be included in everyday diet, respectively: cereal products (33%), fruit (22%), vegetables (16%), milk (14%) and meat (10%) (Figure 3).

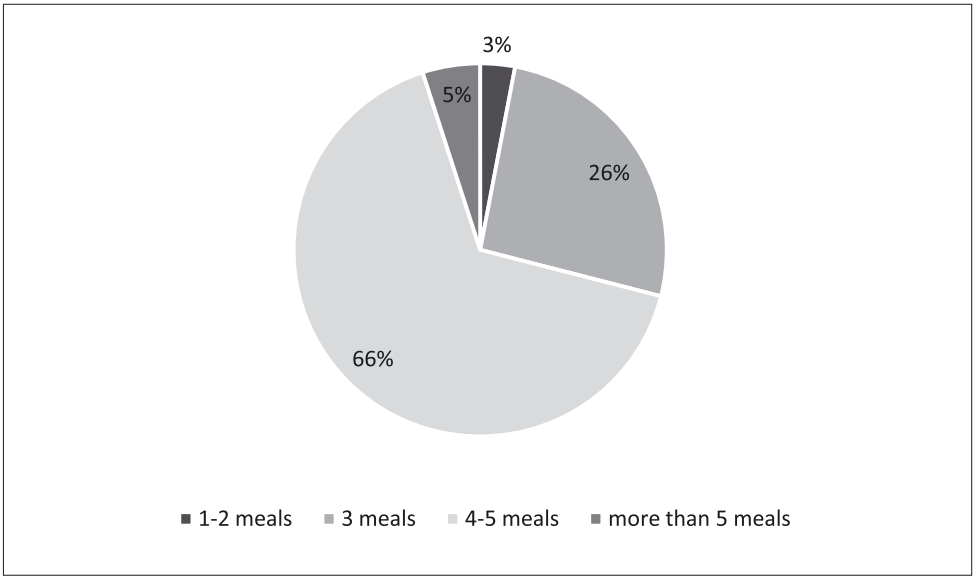

Figure 2. Which of the mentioned products are the source of proteins?

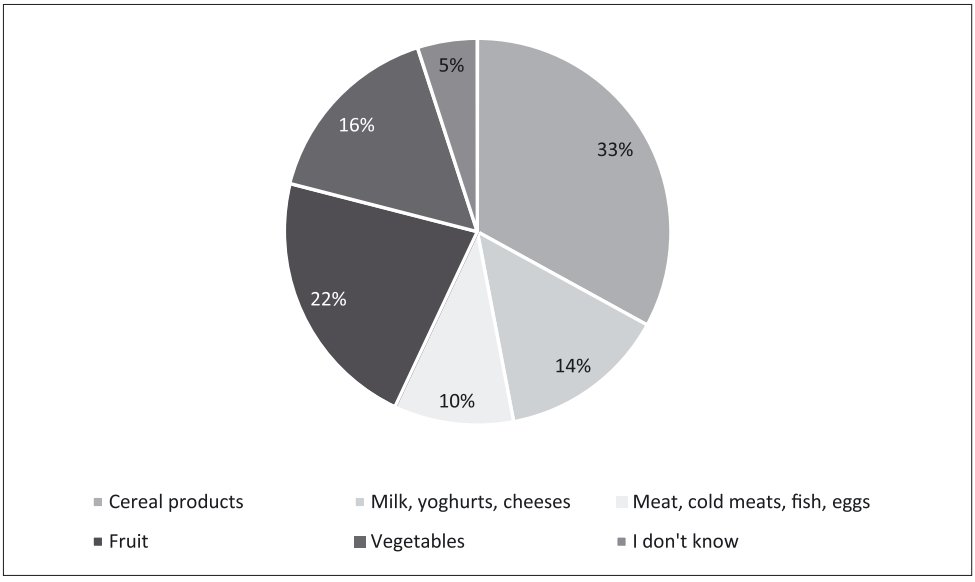

Figure 3. Which products should prevail in everyday diet?

In consequence of the analysis it was found out that statistically significantly more seldom boys indicated cereal products as those which should prevail in everyday diet in comparison with girls (p=0.016). The analysis between the grades proved

that statistically significantly more often the 5th grade pupils indicated cereal products in comparison with the 6th grade pupils (p=0.031).

The respondents only sometimes read the information on the product labels (61%), 25% did not read such information at all, and 14% always did it. According to the survey participants, the following information can be found on food product labels: expiry date (37%), fat content (22%), ingredients (21%), and the amount of calories (20%) (Figure 4).

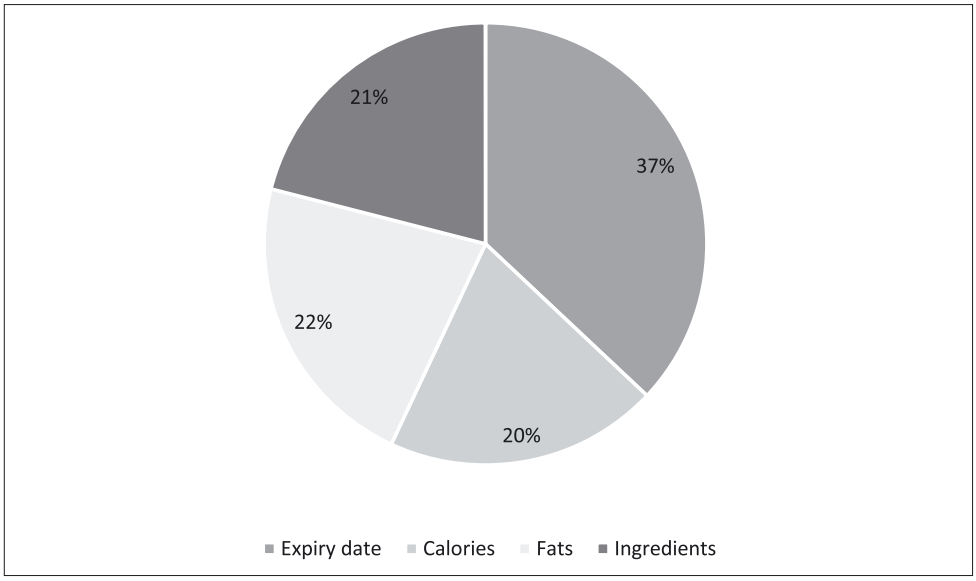

Figure 4. The opinion about the information on the labels on food product packagings

A statistically significant difference was found out between the child's sex and the knowledge about the information which can be found on food product labels. Statistically significantly more often girls in comparison with boys indicated calories and fats that can be found on food product labels (p=0.021). No statistically significant difference was found between the grades of the survey participants and the knowledge about the information which can be found on food product labels.

Children's diet influences their physical development, including body mass. The tallest child was 176.6 cm, and the shortest was 126.8 cm. The body height of all the children differed by 49.8 cm. The biggest observed body mass was 93 cm, and the smallest was 23.7 kg. The maximum difference between the body mass of individual children was 69.3 kg. The biggest value of BMI was 39.21, whereas the lowest BMI

was 13.06. Waist circumference was usually 62.3 cm. Hip circumference was usually 79.60 cm. COLE index was most often 102.23.

Table 2.
Anthropometric measurements of all the survey participants from the 5th and 6th grades

ALL CHILDREN - GRADES 5-6					
	Average	**Median**	**Minimum**	**Maximum**	**Standard deviation**
HEIGHT	148.32	147.55	126.8	176.6	8.83
BODY_MASS	41.32	39.50	23.7	93.0	10.64
BMI	18.57	17.84	13.06	39.21	3.43
WAIST CIRCUMFERENCE	63.87	62.30	49.2	109.0	8.66
HIP CIRCUMFERENCE	80.07	79.60	7.7	112.0	9.46
SYSTOLIC PRESSURE	106.69	110	70	174	14.04
DIASTOLIC PRESSURE	66.50	65	40	141	10.27
COLE	106.10	102.23	75.64	222.80	19.38

The body height of girls and boys differed by 0.89 cm. Both the shortest and the tallest child in the studied population was a girl. The body mass of girls and boys differed by 0.7 kg. The largest and the smallest body mass occurred in girls. The percentage content of adipose tissue among girls and boys differed by 17.35. The biggest percentage content of adipose tissue occurred in boys. The difference between the most frequently occurring BMI value between girls and boys was 11.75. The highest BMI value occurred in boys, and the lowest – in girls. Bigger waist circumference occurred in the boys. On the other hand, the biggest hip circumference occurred in the girls. COLE index reached the biggest values in the studied boys.

The body height of the 5th and 6th graders differed. The 6th grade children were significantly taller. The body mass of the 5th and 6th grade pupils differed. The largest body mass occurred among the 6th grade pupils, whereas the smallest among the 5th grade pupils. The percentage content of adipose tissue of the 5th and 6th grade

pupils differed by 15.33. The biggest percentage content of adipose tissue occurred in the 6th grade children. The difference between the most frequently occurring BMI value between the 5th and 6th graders differed and usually was equal to 1. The highest BMI value occurred in the 6th grade pupils. Bigger waist and hip circumference occurred in the 6th grade pupils. Cole index reached higher values in the surveyed 6th grade pupils.

With the use of Mann-Whitney U test, no statistically significant difference was found out in the Body Mass Index (BMI) between girls and boys attending the 4th-6th grades of primary school (p=0.83 N.S.).

Discussion

Overweight and obesity are currently a global health and social problem in children and teenagers in developed and developing countries. The problem of obesity has been increasing particularly fast in recent years. The main cause of the excessive body mass gain is the changing lifestyle, decreasing physical activity and a change in eating habits. More and more often children consume high-calorie products, at the same time limiting physical effort. It should be stressed that the problem concerns each age group, regardless of sex and the colour of skin. Research carried out in various regions of the world shows that the number of obese people in the age group up to 18 years old tripled in the last decade of the 20th century. Based on the Internal Obesity Task Force (IOTF) report, the number of obese children in the world is 155 million. Out of this number, 30-45 million are children and teenagers aged 5-17 with overweight or obesity, whereas 22 million are obese children below 5 years of age [6,7,8].

A similar problem concerning an increase in the phenomenon of overweight and obesity occurs among the Polish group of children and teenagers. The number of newly reported cases of obesity is growing dramatically. The results of the research conducted within the project of the National Programme for the Prevention and Treatment of Obesity conducted by the National Food and Nutrition Institute proved that 12-14 % are affected by the problem of overweight and obesity. The intensity of the occurrence of overweight and obesity is diversified regionally [7, 8, 9].

While observing contemporary society, we can say that eating habits have undergone disadvantageous changes consisting in the intake of a bigger number of por-

tions of high-calorie meals. More and more often children and teenagers use fast service bars, and snack between meals. They also reach for sweet snacks and drinks instead of vegetables and fruit. Such eating behaviours are contributing to the growth of the frequency of the occurrence of overweight and obesity in children [7, 11].

The findings of the authors' own research shows that a great majority of the respondents ate lunch (87%), most often bringing it from home (81%). It should be stressed that only 44% of the respondent ate it every day. The main meal during the day, namely dinner, was eaten by 74% of the respondents, whereas supper was consumed by 58% of the survey participants. The research conducted in 2004 by Woynarowska and Mazur shows that on school days only 69% of the teenagers ate breakfast every day. About 80% of the boys and girls ate dinner every day. The result was similar for supper [12]. According to Sygit and associates, around 83.13% of children ate breakfast before leaving for school, dinner was eaten every day by 94.76%, and supper by 88.6% [13]. Over half of children, 83%, also bought some additional food and drinks. The products which were most often consumed by the respondents were: fruit (47%), sweets (44%) and Coca–Cola (24%). The research conducted by Woynarowka and Mazur shows similar results. According to them, under 46.1% of teenagers ate fruit every day, sweets were eaten by 36.4%, and Coca Cola was drunk by 25.4% [12]. In the research carried out by Sygit and associates, 34.9% consumed sweets every day, but 56.35% of the surveyed children ate vegetables and fruit [13]. Another research, conducted by Dzielska and associates, shows that the percentage of frequent intake of vegetables and fruit has decreased both among boys and girls. In 2006, the percentage was 49% and 35%, respectively [14].

It should be emphasized that a part of the studied population has never eaten brown bread (14%). The findings of the research of Stankiewicz and associates show that the biggest number of the respondents (91%) reach for vegetables and fruit to stay healthy [8]. The consumption of sweets differed between the grades. Sweets were eaten more often every day by the 6th grade pupils (20%) in comparison with the 5th grade pupils (11%). According to Stankiewicz and associates, 40% of the survey participants ate sweets and drank Coca Cola or other fizzy drinks at least once a day [8].

Another statistical difference occurs between the regularity of the intake of milk and the sex of the surveyed children from grades 5-6. There were statistically significantly more boys (7%) who more seldom than 1 time a week drank milk in comparison with girls (3%) from grades 5-6. The respondents had knowledge about the

recommended number of meals during the day, 66% had 4-5 meals a day. They also knew in which products there are the biggest amounts of protein (milk, yoghurts, cheeses – 63%). The situation was similar with the knowledge concerning the source of the healthiest fats (fish, olive oil – 71%). The knowledge about the amount of individual food products in everyday diet was on a good level. The respondents indicated that cereal products should constitute 33%, fruit 22%, vegetables 16%, dairy products 14% and meat 10%. The research conducted by Stankiewicz and associates claimed that the intake of a fewer number of meals may lead to the formation of the body excess in children and be related to one-time intake of more calories [8].

Overweight and obesity are an important social problem of our times. The constant growth of the problem of overweight and obesity among the whole society, and particularly among children and teenagers, is really alarming. In order to suppress the increasing trends of the occurring obesity, it is important to promote healthy lifestyle mainly consisting in proper choices of food products and an increase in physical activity in each age group, namely from childhood to the old age.

Conclusions

The level of knowledge about healthy lifestyle among the surveyed children is not sufficient to keep the proper body mass.

The respondents most often snack sweets, cakes, crisps and sweet fizzy drinks between meals. The mentioned product should be replaced by vegetables, fruit and natural juices.

In spite of the nutrition awareness possessed by children, there is still a need for constant education in healthy lifestyle.

The suppression of the increasing epidemics of obesity among children and teenagers should be a priority task of the worldwide health policy.

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