Selected eating habits in upper secondary school: Adolescents from the region of Podkarpacie

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Abstract

Lifestyle determines human diet. Such factors as school environment, aggressive advertising or nutrition fashion affect the diet during adolescence.

The aim of this study was to assess selected eating habits in relation to the assessment of the nutritional status of adolescents in upper secondary school age.

Studies on students, mainly from rural areas, were carried out in the school year 2010. The study included 114 students aged 16-18 years, from upper secondary school with diversified educational profiles in Lesko. To assess the diet a qualitative method, that is, an anonymous food frequency questionnaire (FFQ) of consumption of selected products and beverages, was used. Assessment of nutritional status was based on the interpretation of BMI and WHtR (Waist to Height Ratio) obtained from the students' anthropometric measurements results.

The statistical significance in the interpretation of BMI in gender groups (p=0.0075) and groups with various educational profiles (p=0.0013) has been observed. On the basis of the interpretation of WHtR the abdominal obesity was more common among girls (18.42%) and students of the secondary technical school of catering (24.24%). Gender was a significant factor differentiating the number of meals (p=0.0221). Eating irregular meals was proven in the study and the intervals between meals in distinguished groups were up to 4 hours (45.85% of the total). Adolescents from the region of Podkarpacie declared lower frequency of consumption of "fast-food" products.

Occurring abnormal eating habits were characteristic for the examined age group. Occurring dietary mistakes did not significantly affect the assessment of body mass.

Introduction

Eating habits are an integral part of a lifestyle that affects human health [1]. Eating habits acquired in home environment result from many factors including economic situation, cultural, religious, geographical and social habits [2]. Nutritional needs change at different stages of life. The demand for energy and nutrients obtained from food changes also among adolescents, due to the period of adolescence and occurring physical changes [3]. Properly balanced diet allows normal development of the body of youngsters and prevents the occurrence and development of many diseases in later life [4]. Many Polish and international researches confirm abnormal eating habits manifested by eating irregular meals and eating between meals [5]. Incorrect intake of upper secondary school students consists of a large share of sweets and fast food products in their diet [6].

The aim of this study was to assess selected eating habits in relation to the assessment of the nutritional status of the examined upper secondary school adolescents from Lesko.

Materials and methods

The studies were conducted in the school year 2010 among students of first and second classes of upper secondary school with diversified educational profiles including: secondary technical school of catering, vocational technical high school of landscape architecture and secondary technical school of economics. Total number of subjects participating in the study was 114 students (76 girls and 38 boys) aged 16-18 years. For the research purposes the division into groups based on gender and profile of education (secondary technical school of catering – 32 people vs. other profiles – 82 people) has been assumed. Students of the secondary technical school of

Table 1. Anthropometric characteristic of examined group

Feature	Gender		Educational profile	
	Boys n=38	Girls n=76	Catering n=32	Others n=82
Age [years]	16.47±0.51	16.68±0.52	16.59±0.50	16.62±0.54
Body height [m]	1.77±0.08	1.65±0.06	1.67±0.08	1.70±0.09
Body mass [kg]	69.71±11.05	55.55±8.37	63.19±12.89	59.13±10.73
Waist circumference [cm]	78.69±9.87	75.08±9.71	79.79±10.84	74.76±9.11
Hip circumference [cm]	90.83±13.45	92.35±8.29	94.34±12.02	90.90±9.19
Average BMI [kg/m^2]	22.19±2.44	20.37±2.96	22.46±3.75	20.39±2.30

N – number of subjects, X±SD arithmetic mean and standard deviation

catering in the curriculum have included subjects in the field of food and nutrition. To assess the diet a qualitative method, that is, an anonymous food frequency questionnaire (FFQ) of consumption of selected products and beverages developed by the Department of Human Nutrition of Jagiellonian University Medical College, was used.

To assess the nutritional status of the examined group, students were asked to fill in the survey on their current weight, height, as well as waist and hip circumference (measured on the research day by the person conducting the survey). On the basis of the results of this survey BMI (Body Mass Index) and WHtR (Waist to Height Ratio) were calculated. Interpretation of BMI, according to WHO guidelines, has been referred to the current and representative for Polish population of children and adolescents percentile charts from the OLAF study [7]. Abdominal obesity for both sexes was ascertained when the value of WHtR was equal to or greater than 0.5 [8]. Appropriate ranks had been assigned to qualitative data obtained from the survey and then prepared in such a way quantitative data has been subjected to statistical analysis. Nonparametric Mann-Whitney U test for differences between groups at a significance level assumed α=0.05 was used. Statistical analysis was performed using STATISTICA PL 9.0 (UJ license). The study was approved by the Bioethical Committee of the Jagiellonian University KBTET/62/B/2013.

Results

In the examined group the majority of respondents were girls (66.77%), boys were outnumbered two to one (33.33%). Mean age of adolescents was 16.61 ± 0.52 years. Subjects of the study mainly lived in rural areas (84.17%), and 15.83% respondents indicated city as their current

place of residence. The majority of respondents had siblings (95%), only children constituted 5% examined population. Among respondents' parents dominated vocational education (45.70%), the lowest percentage of people had higher education (7.28%). In the majority of households father was the working parent. The mean number of people living in a household in total was 5.44±1.45.

According to the examined adolescents near 40% parents do not always have enough money to buy the food they want to buy. 8.46% respondents declared lack of money to buy food planned by their parents.

Table 1 presents the anthropometric characteristics of the adolescents depending on gender and educational profile. Statistically significant differences appeared in body weight (p=0.0001) and waist circumference in gender groups (p=0.0120), and waist circumference in educational profile groups (p=0.0291). Statistically significant differences in mean value of BMI in gender groups (p=0.0001) and educational profile groups (p=0.0029) were also noted.

Figures 1 and 2 present an assessment of the nutritional status of adolescents in the interpretation of BMI. There were statistically significant differences in the interpretation of BMI in gender groups (p=0.0075) and educational profile groups (p=0.0013). Obesity was more often related to male adolescents and students of secondary technical school of catering [Figure 1 and Figure 2].

WHtR showed no statistically significant differences in its interpretation. However, abdominal obesity, according to WHtR, was more often related to girls (18.42%) than boys (11.11%). In the educational profile division central obesity was significantly more frequent (p=0.0034) among students of secondary technical school of catering (24.24%) than students of other profiles (12.66%).

A number of significant differences in the

Table 2. Average frequency of consumption of selected product groups depending on gender

Product	Entire population X±SD	Gender		Educational profile	
		Boys X±SD	Girls X±SD	Catering Vocational X±SD	Others X±SD
White wheat bread	3.58±0.75	3.41±0.88	3.66±0.67	3.52±0.76	3.60±0.76
Fruits	3.44±0.55	3.48±0.55	3.43±0.55	3.47±0.56	3.43±0.54
Sugar	3.41±0.80	3.51±0.64	3.36±0.87	3.22±0.83	3.48±0.78
Vegetables	3.20±0.62	3.23±0.67	3.19±0.60	3.13±0.71	3.23±0.59
Sweets	3.17±0.75	3.08±0.76	3.21±0.74	3.00±0.89	3.23±0.68
Cheese	3.08±0.75	3.21±0.66	3.03±0.80	3.00±0.87	3.12±0.71
Biscuits	2.88±0.72	2.98±0.70	2.84±0.74	2.88±0.81	2.88±0.69
Milk	2.87±0.98	3.36±0.78*	2.64±0.98*	2.88±0.89	2.87±1.02
Yogurts	2.83±0.78	3.00±0.86	2.75±0.74	2.88±0.74	2.81±0.80
Cottage cheese	2.73±0.85	2.88±0.88	2.65±0.83	2.71±0.97	2.73±0.80
Low-fat cold meats	2.68±0.79	2.69±0.69	2.68±0.84	2.48±0.94	2.76±0.72
Poultry	2.50±0.78	2.49±0.68	2.50±0.83	2.24±0.87**	2.59±0.73**
Pastas	2.48±0.72	2.60±0.67	2.41±0.74	2.59±0.82	2.43±0.68
Whole wheat bread	2.47±0.98	2.74±1.02*	2.34±0.94*	2.64±0.96	2.41±0.99
Crisps	2.43±0.81	2.53±0.78	2.38±0.82	2.29±0.84	2.48±0.79
Grits, rice	2.42±0.78	2.69±0.77*	2.29±0.75*	2.64±0.90	2.34±0.71
Ice creams	2.36±0.70	2.28±0.64	2.40±0.73	2.12±0.59**	2.45±0.72**
Fat cold meats	2.22±0.90	2.63±0.82*	2.03±0.87*	2.09±1.01	2.27±0.85
Fish	2.18±0.72	2.44±0.68*	2.05±0.71*	2.42±0.83**	2.08±0.65**
Pork	2.12±0.80	2.56±0.79*	1.90±0.71*	2.09±0.84	2.13±0.78
Beef, veal	2.05±0.76	2.44±0.72*	1.86±0.71*	1.91±0.72	2.11±0.77
Hamburgers	1.88±0.67	2.13±0.66*	1.76±0.64*	1.73±0.52	1.94±0.71

X±SD arithmetic mean and standard deviation, * – p<0.05 statistically significant differences in gender groups
** – p<0.05 statistically significant differences in educational profile groups
Frequency consumption scale: Every day or more than once a day – 4, several times a week – 3, less than once a week – 2, never – 1

distribution of consumption of selected food groups according to gender were indicated [Table 2].

Wheat bread (white) and fruit were the products most often consumed by the respondents. In the group of boys the most often consumed product was sugar, while among girls white wheat bread. Differences in the consumption of hamburgers, depending on gender, were observed. Boys were also significantly more likely to eat meat (such as beef, veal, pork, fish), cold meats, as well as groats, whole wheat bread and milk.

In the group of students of secondary technical school of catering and other educational profiles statistically significant difference in the mean frequency of consumption of selected products, including fish, poultry and ice cream were observed [Table 2]. Students of secondary technical school of catering rarely ate hamburgers, most often they ate white wheat bread and fruit. Students of other educational profiles also often chose white wheat bread and sugar.

The examined adolescents were also asked about the frequency of "fast-food" products consumption (e.g. hamburgers, pizza, crisps). There was no statistically significant correlation in the frequency of "fast-food" products eating in either of the examined groups. 35% respondents consumed "fast-food" products once a month.

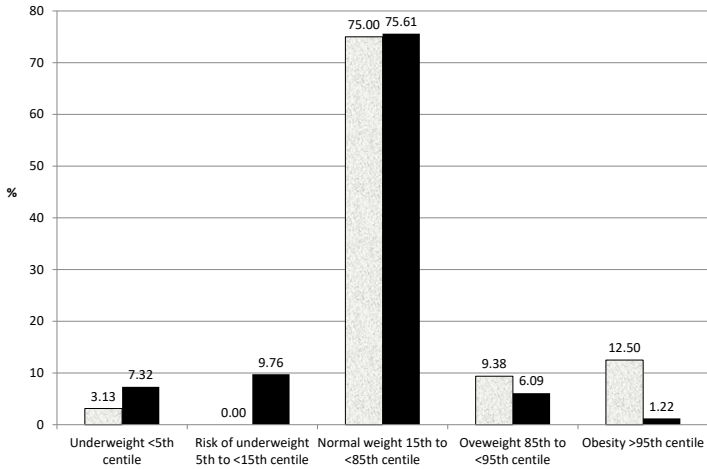One of the criteria for assessing eating habits

Figure 1. Assessment of nutritional status of young people in the interpretation of BMI by gender
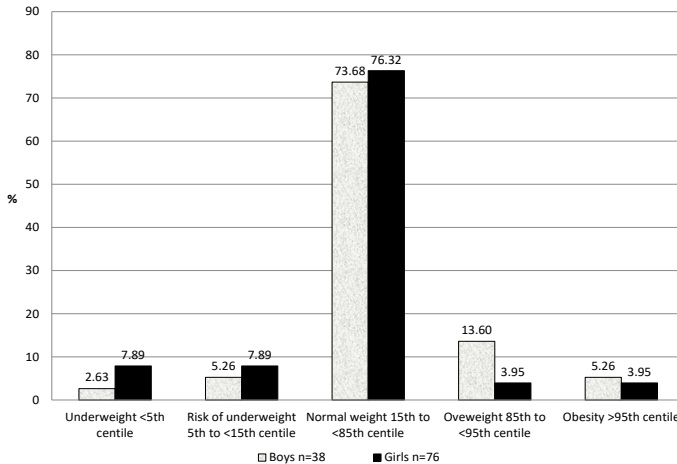

Figure 2. Assessment of nutritional status of young people in the interpretation of BMI by educational profile

is the number of meals. The examined adolescents from Lesko most often ate three meals a day (37.50%). Statistically significant difference in the number of meals (p=0,0221) was compared with the gender group. Out of the five possible regular meals a day the adolescents most often ate lunch (93.33%) and the fewest had afternoon tea (33.33%). The intervals between meals in the examined group were usually longer than 4 hours (45.83%). Fruit (75%) and sweets (65.83%) were the products most often eaten between meals in both divisions, by gender and by

educational profile.

The examined adolescents were also asked about the use of weight loss diets. The majority of respondents (75.83%) admitted that they did not use diet to reduce weight.

Discussion

The assessment of eating habits of adolescents from various areas and environments proves the constant need for updating information on diet and nutritional status of adolescents in Poland.

In this study, the interpretation of BMI among adolescents from Lesko most often showed correct weight. Obesity significantly more often concerned boys and students of the secondary technical school of catering. Higher prevalence of obesity among boys in the group of adolescents aged 10-15 years from rural areas was reported by Czeczelewski [5]. Among adolescents from Zachodniopomorskie Voivodship schools and schools from Krakow, Chrzanow and Kalisz similar results as in this study were observed [4,6,9,10].

The prevalence of obesity among young people, including central obesity is related to a risk of many diseases including metabolic syndrome or diabetes mellitus type 2 [8]. Visceral obesity was found in 15.18% of the total of respondents from Lesko. This type of obesity more often occurred among examined girls (18.42%), however this difference was not statistically significant. Researches conducted in Łódź in the age group 14-19 years showed a higher occurrence of central obesity in boys 7.6% and adequately 5.9% in girls [8].

Among the upper secondary school students examined by Przybylski et al. in the group with normal weight (BMI between 10-90 percentile) WHtR>90 percentile were observed in 4.4% of the entire group. Metabolic obesity (WHtR>90) in people who are overweight (BMI>90 percentile) was proven in 13.6% of all patients [11].

In this study adolescents most often ate wheat bread (white) and fruit with average frequency more than three times a week. Hamburgers were eaten least likely. The results shows that sugar is the most often consumed product in the group of boys, while white wheat bread is the most consumed product among girls. Adolescents from Lesko ate sweets with an average frequency of several times a week. Excessive share of sweets in adolescents' diet has been pointed by other researchers [12,13,14,15,16,17]. Studies conducted

by Mojska et al. indicate that "fast-food" products constitute a significant source of salt in a diet [18]. In the studies conducted in Warsaw 40% to 80% of respondents, depending on their place of residence, declared consumption of such products [19]. Reported low frequency of consumption of hamburgers in the examined group may be a symptom of a healthy behaviour. Among the adolescents from Lesko, girls more often than boys, ate sweets. More girls than boys consumed sweets among children form Wroclaw, although, according to the authors, the differences in consumption were not large [20].

The study conducted by Kowalska proved that positive eating habits are related mostly with consumption of milk and milk products as well as fruit and vegetables [12]. In the study carried out by Gacek and Fiedor in some of the questions concerning the consumption of certain products recommended in a reasonable diet, nearly half of the subjects ate fish less than once a week. Girls reported more frequent consumption of fruit and vegetables and low-fat dairy products. In case of fruit and vegetables almost two thirds of girls and half of boys ate them a few times a day. Boys most frequently declared consumption of fruit and poultry, they ate groats and giblets less likely [14]. The results presented by Gacek and Fiedor correspond with the results of the study conducted by Frączek [14,16]. The examined adolescents rarely ate fish, dairy products, and whole wheat bread [16]. The study by Czarniecka-Skubina and Namysław shows that only some students consumed fruit and vegetables 4 to 5 times a day [21]. Respondents from Lesko declared that fruits are usually chosen to eat between meals. Students of the secondary technical school of catering more often chose low-fat products, such as whole-wheat products and fish and, in comparison to other educational profiles they rarely ate sugar, sweets and crisps. Among the students from Krakow the educational profile related to health had a positive impact on making decisions related to nutrition [22], in contrast to the results obtained among the students of the Food and Hotel Management Complex in Radom in the study by Janiszewska et al. [23].

In the studies by Kowalska cited previously only every 14th student ate five meals a day [12]. In the group of respondents from Lesko 37.5% ate three meals a day, 21.67% ate four meals a day, and 20.83% five meals a day. The least likely meal consumed by young people is afternoon tea [12],

which was also proven in the present study. In contrast to other studies of rural adolescents' eating habits [12,24], almost 77.50% respondents from Lesko ate breakfast at home. As in the study carried out by Piórecka et al. [25] girls from Lesko apply slimming diets (27.50% of the total) more likely than boys.

Conclusions

– According to BMI and WHtR excessive body weight and central obesity more often were related to examined boys and students of the secondary technical school of catering.

– Improper eating habits were mainly related to the frequency of wheat bread and sugar consumption, which may be associated with abdominal obesity.

– Rural adolescents declared that they rarely consume "fast-food" products.

Resumo

Vivmaniero influas homan dieton. Faktoroj kiel la medio ene de la lernejo, agresema varbado aŭ modoj de nutrado havas efikon sur la dieto dum junaĝo.

La celo de tiu ĉi esploro estis pritaksi elektitajn manĝkutimojn en rilato kun la pritakso de nutra statuso de pli aĝaj gejunuloj en sekundara lernejo.

Esploroj pri studentoj, ĉefe de kamparaj regionoj, estis faritaj dum la lernojaro 2010. La esploro inkluzivis 114 studentojn, kiuj aĝis 16-18 jarojn de sekundara altlernejo kun diversaj edukadaj profiloj en la urbo Lesko. Por pritaksi la dieton estis uzita kvalita metodo, t.e. anonima demandaro pri manĝofteco (FFQ) koncerne elektitajn produktojn kaj trinkaĵojn. La pritakso de la nutra statuso baziĝis sur la interpretado de BMI kaj WHtR obtenitaj de la rezultoj de la antropometriaj mezuradoj de la studentoj. Ni respektis la statistikan signifon dum la interpretado de la BMI en seksgrupoj (p=0.0075) kaj grupoj kun diversaj edukadaj profiloj (p=0.0013). Surbaze de la interpretado de la WHtR (kvociento de talio kaj alteco) la ventrobezo estis pli ofta ĉe knabinoj (18.42%) kaj studentoj de la sekundara teknika lernejo pri nutrado (24.24%). Sekso estis signifa faktoro koncerne la oftecon de manĝoj (p=0.0221). La okazo de neregulaj manĝoj estis pruvita en tiu ĉi esploro kaj la intervaloj inter la manĝoj en specifaj grupoj estis ĝis 4 horojn (45.85% de la tuto). Gejunuloj de la regiono Podkarpacie raportis malplian oftecon de la kunsumado de "rapid-manĝaĵoj" produktoj. La okazintaj nenormalaj manĝmanieroj estis tipaj por la ekzamenita aĝgrupo. Okazintaj dietaj eraroj ne signife influis la pritakson de la korpa maso.

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