Emergency Medicine Department of Child Neurosurgery and Emergency Medicine Clinic, Public Health Faculty Medical University of Silesia in Katowice Zakład Medycyny Ratunkowej Katedry Neurochirurgii Dziecięcej i Medycyny Ratunkowej Wydział Zdrowia Publicznego, Śląski Uniwersytet Medyczny w Katowicach ul. Piekarska 18, 41-902 Bytom

*Department of Basic Medical Sciences, Public Health Faculty Medical University of Silesia in Katowice
*Katedra i Zakład Podstawowych Nauk Medycznych Wydział Zdrowia Publicznego Śląski Uniwersytet Medyczny w Katowicach ul. Piekarska 18, 41-902 Bytom

JOANNA MAKARSKA, DARIUSZ MYRCIK, MAGDALENA TRZEPITZUR, KAROLINA WALAS*, KATARZYNA CHOJNACKA*, TOMASZ STĘPIEŃ, ARKADIUSZ NICZYPORUK, BOGUSŁAW BUCKI, MAREK MANDERA

Nutrition habits of upper-secondary school students in the Silesian Voivodeship

Nawyki żywieniowe wśród uczniów szkół ponadgimnazjalnych w województwie śląskim

Key words: nutrition habits, upper-secondary school

INTRODUCTION

As commonly known, inappropriate nutrition habits may lead to numerous diseases and health complaints such as obesity, diabetes and atherosclerotic disease. The time of adolescence and intensive learning results in increased energy and nutrients intake demand of a young organism. Proper nutritional habits help to balance
the nutritional value of meals. Living and social standards have proven to have an impact on the diet of a young person, conjoined with other factors such as basic nutritional recommendations knowledge. Well-balanced diet not only influences the correct development of an organism but can also sharpen the concentration and learning abilities which is of great importance for young people between 16-20 years old. As recommended by the experts in the field of pediatrics, young people in the age of puberty should consume at least four meals a day in regular intervals conjoined with proper energy expenditure. According to the National Food and Nutrition Institute the energy demand of each person is conditioned by many factors such as age, sex, physical activity, physiological state, body weight and height [1, 12].

Boys between 16-20 years old should intake 450-545g of carbohydrates per day, whereas girls 355g–390g. Carbohydrates play a multifunctional role in the human body - they provide energy and condition the proper vital processes functioning, however, consumed in excess lead to dental caries, overweight and obesity. Fat intake norm for adolescents between the age of 16-20 is 30% of the daily energy demand, where the polyunsaturated fatty acids should constitute 1- 3% of the total energy intake. An important element of a healthy nutrition is the intake of vegetable fats providing the body with unsaturated fatty acids which cannot be synthesized by the organism itself. Protein intake requirements are individual – 100g for a boy in the age of 16-20 years old and 80g for a girl at the same age, where the ratio of the complete protein (animal) to the low value protein (vegetable) should be 1:1 [1, 5, 10].

The aim of the study is to estimate the nutrition habits of upper-secondary school students in the educational institutions of the Silesian Voivodeship. The main consideration is to determine the most frequent proper and inappropriate nutrition habits and to assess the awareness of the respondents as far as the proper nutrition rules are concerned.

MATERIAL AND METHOD

The study group counted 386 students including 238 women and 148 men between 16-20 years old from randomly chosen upper-secondary schools in the Silesian Voivodeship such as: Basic Vocational Schools – 64 students, Secondary Technical School of Catering – 73 students, Technical Educational Centres – 105 students, Secondary School of General Education – 144 students. The research method was based on a questionnaire created by the author of this article - it was anonymous and voluntary. The research tool was a mobile application based on the Android system. The application called “My Menu” has been prepared in the IDE programming environment made by Google based on the IntelliJ – Android Studio. “My Menu” is a simple application allowing to conduct a survey among Android devices users. By following a link, user downloads an application to their device, for example a smart phone or a tablet and the application is installed automatically. After
launching the application users answer the questions one by one without a possibility to leave a question unanswered. Once all the steps of the survey are followed, the information is sent to the server – there the answers have been gathered which allowed the author of this article to analyze the collected material. The questionnaire included questions concerning the sex, age, type of school, dwelling place and questions about the eating habits such as the number of consumed meals during the day, the place of consuming meals, the way the meals are prepared, the frequency of the cereal products intake, as well as vegetable and animal fat, vegetables and fruit, dairy products, sweets, fish and red meat intake. The respondents were also asked to estimate their knowledge concerning the rules of proper nutrition.

RESULTS

A group of 63 (26.5%) female students and 45 (30.4) male students of those polled described their proper nutrition rules knowledge level as “high”, 42 (11.6%) female students and 38 (25.7%) male students described it as “average” whereas 36 (15.1%) female and 31 (20.9%) male students described it as “low”. As many as 97 (40.8%) women and 34 (23.0%) men could not assess their proper nutrition knowledge level at all. Analyzing the results by the type of school provided the following results: Secondary School of General Education students judged their proper nutrition knowledge as “high” comparing to other types of schools – 63 (43.8%) students have chosen the high level of knowledge, 31 (21.5%) students described it as “average”, 18 (12.5%) as “low” and 32 (22.2) students could not assess their level of knowledge at all. Technical Educational Centres students judged themselves worst – as many as 33 (31.4%) students believe that their knowledge is low. Additionally, the questionnaire allowed the author of this article to analyze the dietary habits in the upper-secondary education students in the randomly chosen schools of the Silesian Voivodeship. Once asked about the number of consumed meals a day, 105 (44.1%) female students taking part in the survey answered 3-4 meals, whereas 69 (29%) female students declared to have 5 meals a day. Among the male group the majority - 58 (39.2%) students - admitted to eat 3-4 meals a day. The frequency of consumed meals is presented in the table 1.

Table 1. The frequency of intake of certain types of meals in the surveyed group

<table>
<thead>
<tr>
<th>Type of meal</th>
<th>Frequency of intake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-2 times a week</td>
</tr>
<tr>
<td>Breakfast</td>
<td>106 (27.4%)</td>
</tr>
<tr>
<td>Lunch</td>
<td>56 (14.5%)</td>
</tr>
<tr>
<td>Dinner</td>
<td>7 (1.8%)</td>
</tr>
<tr>
<td>Supper</td>
<td>32 (8.3%)</td>
</tr>
</tbody>
</table>

A group of 76 (31.9%) women and 47 (31.8) men have declared to eat breakfast. The frequency of breakfast consuming is as follows: eating breakfast 3-6 days a
week is declared by 157 (40.7%) of the surveyed – 104 (43.7%) women and 53 (35.8%) men, whereas 106 (27.4%) – 58 (24.4%) women and 48 (32.4%) men - never eat breakfast. A group of 27 (42.2%) students of the Basic Vocational Schools, 49 (34%) students of the Secondary School of General Education, 31 (29.5%) students of the Technical Educational Centres and 16 (21.9%) students of the Secondary Technical School of Catering declared to always eat breakfast before leaving to school. Similarly, 49 (46.7%) Technical Educational Centres students, 33 (45.2%) Secondary Technical School of Catering students 54 (37.5%) Secondary School of General Education students and 21 (32.8%) Basic Vocational Schools students eat their first breakfast 3-6 days per week. The group of students who never consume breakfast consists of 24 (32.9%) Secondary Technical School of Catering students, 41 (28.5%) Secondary School of General Education students, 16 (25.0%) Basic Vocational Schools students and 25 (32.9%) Educational Centres students. The number of 104 (43.7%) women and 68 (45.%) men take their lunch to school. The largest proportion of the surveyed who take their lunch to school are the students of Basic Vocational Schools which gives 41 (64,1 %) students. Almost a half (44.6%) of those polled who never take their lunch to school were the students of the Secondary School of General Education. The product that was most popular as far as the lunch is concerned (for both sexes) are sandwiches chosen by 285 (73.8%) students, including 180 (75.6%) women and 105 (70.9%) men. The choice of sandwiches is declared by 52 (81.3%) Basic Vocational Schools students, 56 (76.7) Secondary Technical School of Catering students, 49 (46.7%) Technical Educational Centres students and 128 (88.9%) students of the Secondary School of General Education. Fruit or vegetables are chosen by 88 of those polled including 64 women and 24 men. Additionally, women choose sweets more frequently than men – 40 women eat sweets for lunch. The lowest percentage of students choosing sweets is represented by the Secondary Technical School of Catering students – 3 (4.1%), the highest is represented by Secondary School of General Education students - 35 (24.3%). A group of 46 (12%) respondents choose yoghurt or diary product for lunch. Dinner is consumed everyday by 127 (85.8%) men and 164 (75.4) women. 54 (84.4%) Basic Vocational Schools students, 111 (77.1%) Secondary School of General Education students, 76 (72.4%) Technical Educational Centres students and 50 (68.5%) Secondary Technical School of Catering students declare to have dinner every day. On the other hand 69 (29.0%) women and 19 (12.8%) men do eat dinners irregularly – 3-6 times a week. Judging on the type of school - 21 (28.8%) Secondary Technical School of Catering students, 28 (26.7%) Technical Educational Centres students, 32 (22.2%) Secondary School of General Education students and 7 (10.9%) Basic Vocational Schools students declared to have dinners irregularly. The number of 5 (2,1%) women and 2 (1,4%) men usually skip dinners. Usually, dinner is not consumed at all by 3 (4.7%) Basic Vocational Schools students, 2 (2,7%) Secondary Technical School of Catering students, 1 (0.9%) Technical Educational Centres student and 1 (0.7%) Secondary School of General Education student. As far as supper is concerned - 85 (35.7%) women and 119 (80.4%) men have declared to consume this meal every day. These numbers include 47 (64.4%) Secondary Tech-
Nutrition habits of upper-secondary school students in the Silesian Voivodeship

63

technical School of Catering students, 39 (60.9%) Basic Vocational Schools students, 53 (50.5%) Technical Educational Centres students and 65 (45.1%) Secondary School of General Education students. On the other hand, 28 (11.8%) women and 4 (2.7%) men have admitted to skip suppers. 125 (52.5%) women and 25 (16.9%) men answered they have supper irregularly. Supper is skipped by 18 (12.5%) Secondary School of General Education students, 9 (12.3%) Technical School of Catering students, 2 (3.1%) Basic Vocational Schools students and 3 (2.8%) Educational Centres students. To eat supper irregularly was declared by 49 (46.7%) Educational Centres students, 61 (42.4%) Secondary School of General Education students, 23 (36.0%) Basic Vocational Schools students and 17 (23.3%) Technical School of Catering students. 23 (9.7%) women and 12 (8.1%) men have admitted never to eat between the meals. However, 45 (18.9%) women and 28 (18.9%) men declared to have a sandwich between the basic meals, 99 (41.6%) women and 47 (31.8%) men admitted to eat only sweets, 53 (22.3%) women and 41 (27.7%) choose only fruit and 18 (7.5%) women and 20 (13.5%) men admitted to have “fast food”.

The results of the conducted questionnaire not only allowed to state the quantity of consumed meals but also helped to determine the type of products that are chosen most frequently by the observed students. The results are the following: 249 (64.5%) of those polled admitted to consume vegetable fat – this includes 155 (65.1%) women and 94 (63.5%) men. Animal fat is chosen by 76 (31.9%) women and 31 (20.9%) men. In general, 7 (3.0%) women and 23 (15.5%) men choose different types of fat. Vegetables and fruit are consumed more frequently than 5 times a week by 32 (13.4%) women and 26 (17.6%) men. 190 (49.2%) respondents have declared to intake vegetables and fruit 3-5 times a week. Cheese can be found in the menu of 167 (43.3%) of students, which counts 99 (41.6%) women and 68 (45.9%) men in the frequency of 3-5 times a week. 97 (25.1%) of the observed chose cheese more often than 5 times a week. Dairy products are chosen only twice a week or are not chosen at all by 95 (39.9%) women and 39 (26.3%) men. 82 (21.3%) respondents consume dairy products more often than five times a week. Red meat is a choice for 217 (56%) students 3-5 times a week – 68 (17.6%) consume it even more often. White meat is chosen by 103 (26.7%) of those polled up to 2 times a week – the number involves 64 (26.9%) women and 39 (26.3%) men. Only 22 (5.7%) respondents consume fish more frequently than 5 times a week, 42 (10.9%) students chooses this type of product 3-5 days a week. 322 (83.4%) of those polled have declared to eat fish twice a week or even less often. The below table depictures a detailed analysis of the consumed products type, as well as the frequency of certain products intake.
Table 2. The frequency of intake of different food products in the observed students group

<table>
<thead>
<tr>
<th>Food products</th>
<th>Frequency of intake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-2 times a week</td>
</tr>
<tr>
<td>Fish</td>
<td>322 (83.4%)</td>
</tr>
<tr>
<td>Red meat</td>
<td>101 (26.2%)</td>
</tr>
<tr>
<td>White meat</td>
<td>103 (26.7%)</td>
</tr>
<tr>
<td>Cheese</td>
<td>122 (31.6%)</td>
</tr>
<tr>
<td>Dairy</td>
<td>134 (34.7%)</td>
</tr>
<tr>
<td>Vegetables and fruit</td>
<td>138 (35.8%)</td>
</tr>
<tr>
<td>Słodyceze</td>
<td>83 (2.1%)</td>
</tr>
<tr>
<td>White bread</td>
<td>32 (8.3%)</td>
</tr>
<tr>
<td>Dark bread</td>
<td>8 (2.1%)</td>
</tr>
</tbody>
</table>

The observed students were also asked to describe the way their favorite meals are prepared. The largest group has chosen the fried meals – 259 (67.1%) and baked meals - 207 (53.6%). The less popular methods of preparing meals were to boil or to steam – 151 (39.1%) persons have chosen these two methods, including 97 (40.7%) women and 54 (36.5%) men. Stewed meals are most popular among 63 (26.5%) women and 45 (30.4%) men.

**DISCUSSION**

Our health is strongly influenced by everyday dietary habits - excess or deficiency of different nutrients affects negatively the whole body. On the other hand, correctly balanced diet can provide an organism with all the essential nutrients such as proteins, fats, carbohydrates, vitamins, micro- and macro elements, as well as sufficient amount of fluids. Bearing in mind the time of adolescence is a time of turbulent body transformation, young people between 16-20 years old should pay particular attention to their dietary habits. Primary and secondary schools offer healthy nutrition courses within their teaching programs - one could therefore assume the knowledge level among upper-secondary schools students is high. The results of the questionnaire have proven however, that only 28% of students believe their knowledge regarding the healthy nutrition is high, about 21% respondents judged it as “average” and 17% declared low nutrition awareness. As many as 34% of the observed students could not assess their knowledge level at all. A similar research has been conducted by Gajewska et al. [7] in 2005 in upper-secondary schools student in the Mazovian Voivodeship. The results of the carried out survey have proven 10 % of those polled judging their knowledge as “very good”, 28% “satisfactory” and only 2,2% as “insufficient” [7]. Similar results have been obtained by Sygit [11] who surveyed the dietary habits of upper-secondary schools students. Vegetables should be consumed a few times a day [4] by young people as
they play a vital role in the diet of a growing young organism. As the conducted survey shows, only 15% of those polled consume vegetables more often than five times a week. The problem has been pointed out in the World Health Organization’s report regarding health behavior of young people. According to WHO as much as 62% of the adolescent do not intake raw vegetables every day, whereas cooked vegetables do not appear in the daily diet of 55% of the examined population of young people [13]. The best source of vegetable fat are vegetable oils such as olive oil, rapeseed oil and saltwater fish fat [8]. Over a half of respondents (64%) use vegetable fats to prepare their meals. As a young organism demands a greater amount of proteins, their diet should be rich in meat, cured meat and fish – the fish being especially beneficial for a young organism. Saltwater fish contain vital unsaturated fatty acids, iodine and mineral components [4]. Unfortunately as many as 83% of the examined group do not consume fish or consume it only twice a week. Only 5% of the respondents eats fish more often than 5 times a week. Milk and milk products are agreed to be the most nutritious products as far as the calcium content is concerned – therefore such products should be consumed every day [2]. According to the survey done, 21% students consume milk drinks more often than 5 days a week. As recommended by the Polish Academy of Sciences Committee of Human Nutrition Science three to five meals should be consumed every day – breakfast being compulsory. 70 % of those polled declared intake of 3-5 meals a day. The obtained results correspond with the results claimed by Gajda et al. [6] in the group of young people in Świętokrzyskie Voivodeship where 54% of the adolescent consume 4-5 meals a day [6]. In order to provide the organism with a chance to function properly every day it is essential to deliver enough energy and nutrients in the form of breakfast considered to be the most important meal during the day [13]. Breakfast is consumed daily by 32% of those polled in the questionnaire. The results are different from the conclusions stated by Cieślik et al. [3] in a survey conducted in Subcarpathian Voivodeship in 2003 where 70% of those polled claimed to consume breakfast before leaving to school [3]. Almost a half of our respondents take lunch to school. Dinner perceived as an essential meal in the diet of children and young people should be a combination of proper quantity and quality of products prepared in a proper way [9]. Dinner consuming on a daily basis was declared by 75% similarly as in the survey done by Woynarowska [13] where 80% students reported to consume dinner every day. The proper nutrition’s essential condition is to provide the organism with energy and nutrients in correct quantity and frequency as this in consequence leads to proper development of a young organism. Bearing in mind the dietary habits among young people do not always fulfill the above conditions – educational institutions should focus on the nutrition habits of their pupils on a greater scale.
CONCLUSION

1. The majority of upper-secondary schools students in the Silesian Voivodeship is unable to assess their level of knowledge as far as the proper nutrition is concerned, whereas one fourth judge it as high.

2. Proper nutrition habits observed in the surveyed group of students include: intake of at least 4 meals per day, frequent usage of vegetable fats rather than animal fats.

3. Inappropriate nutrition habits diagnosed in the surveyed group include: improper choice of products and their combination – frequent intake of white bread, insufficient intake of fish and dairy products in every day’s diet, eating between the proper meals (especially sweets) and intake of fried meals.

REFERENCES


ABSTRACT

The aim of the study is to estimate the nutrition habits of upper-secondary school students in the educational institutions of the Silesian Voivodeship. The study group counted 386 students including 238 women and 148 men between 16-20 years old. The majority of students is unable to assess their level of knowledge as far as the proper nutrition is concerned, whereas one fourth judge it as high. Proper nutrition include: intake of at least 4 meals per day, frequent usage of vegetable fats rather than animal fats. Inappropriate nutrition habits include: improper choice of products and their combination – frequent intake of white bread, insufficient intake of fish and dairy products in every day’s diet, eating between the proper meals (especially sweets) and intake of fried meals.

STRESZCZENIE

Celem pracy była ocena nawyków żywieniowych młodzieży ponadgimnazjalnej wybranych szkół województwa śląskiego. Ankiety przeprowadzono w grupie 386 uczniów, w tym 238 kobiet i 148 mężczyzn w wieku od 16 do 20 lat. Większość ankietowanych uczniów nie jest w stanie ocenić swojego poziomu wiedzy w zakresie zasad prawidłowego odżywiania, a jedna czwarta uczniów ocenia go jako wysoki. Prawidłowe nawyki żywieniowe to: spożywanie przynajmniej 4 posiłków dziennie, częstsze spożywanie tłuszczów pochodzenia roślinnego niż zwierzęcego. Nieprawidłowe nawyki żywieniowe to: nieprawidłowy dobór produktów i komponowanie posiłków – częstsze spożywanie jasnego pieczywa, zbyt mała ilość ryb i produktów mlecznych w codzienniej diecie, podjadać między posiłkami, najczęściej słodyczy oraz spożywanie potraw smażonych.

Artykuł zawiera 23054 znaki ze spacjami