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Evaluation of the way of nutrition of adult population of Lublin and Biłgoraj

Proper nutrition is to provide the organism with all indispensable dietary components in adequate amounts and proportions taking into account the number of meals and their distribution throughout the day. The quantitative content of individual nutrients in a food ration should depend on age, sex, job and health condition. Unfortunately, improper quantitative and qualitative proportions are observed in the current nutrition of people. The issues of nutrition become increasingly important in connection with the fact that both under- and overnutrition often result in various pathological conditions. Inadequate nutrition, depending on its nature, causes many diseases or facilitates their rapid development. Bad nutrition results in numerous metabolic disorders such as: diabetes, obesity, emaciation or atherosclerosis. The most common dietary errors include irregular meal consumption, too high intake of animal fat, inadequate intake of milk, dairy products and fish as well as poor variety of fruits and vegetables, mainly in winter and spring. It should be remembered that effects of improper nutrition manifest themselves in latent deficiencies in nutrients, digestive complaints and premature aging.

The main aim of the study was to analyse the way of nutrition of the inhabitants of a big urban agglomeration, i.e. Lublin and small town people living in Biłgoraj, especially to evaluate qualitatively nutrition and to indicate the most common dietary errors which are likely to affect current health and endanger future health.

MATERIAL AND METHODS

The study encompassed 214 adults including: 101 individuals from Lublin (group A), 113 individuals from Biłgoraj (group B). The population examined underwent mass and height measurements; the results were compared with body mass index (BMI) to determine the degree of obesity of both populations. Dietary habits were assessed using an anonymous questionnaire concerning the number and regularity of meals, their composition and frequency of intake of such foodstuffs as sweets or fast food. Moreover, the questions dealt with current health state of the individuals examined and other habits which may affect their future health: smoking or leisure time activities. The results were statistically analysed. The values of parameters were characterized by number and percentage. The differences between groups for unrelated quantitative characteristics were detected by the $\div^2$ homogeneity test. The correlations between characteristics were examined by the $\div^2$ independence test. $P<0.05$ was considered statistically significant. Database and statistical calculations were conducted using Statistica 6.0 software (StatSoft, Poland).

RESULTS

The results of mass and height measurements were similar to BMI in both populations, which is shown in figures 1 and 2. Abnormal parameters were found in 56% of group A(57) and in 53% of group B (60). Deficient body mass was observed in 9 (9%) individuals from Lublin (A) and in 15 (13%) from Bilgoraj (B). The most numerous group with underweight consisted of those between the ages 21–30 both in Lublin and Biłgoraj. Overweight was found in 34% of subjects in group A and B, most often in those aged 41–50. In the population of Lublin (A), obesity was observed in 14% of individuals – mainly at the age of 51–60, while in Biłgoraj (B) – in 8%, mostly in people over 60. In Lublin, the cases of giant obesity were not found while in Biłgoraj they accounted for 1% of those examined.

Table 1 presents the results of evaluation of nutrition and other behavioural patterns in the populations of Lublin (A) and Biłgoraj (B). Proper distribution of meals throughout the day (4–5) was observed in 61.1% of population B and 44.5% of population A, which indicates statistically significant differences ($p<0.05$) between the number of meals and place of residence. The remaining respondents in both groups claimed the consumption of 3 meals a day. There were no statistical differences in breaks between meals as the majority of group A (66.3%) and B (67.3%) claimed to have 4–6 hour breaks. More people from Biłgoraj (81.4%) assessed the meals consumed as irregular, compared to 53.5% in Lublin ($p<0.05$). This difference was statistically significant. The comparative analysis demonstrated that the inhabitants of Biłgoraj statistically significantly more often (i.e. in 75% of meals) consumed products containing animal fat (81.4%), milk and dairy products were consumed every day by 51.3% ($p<0.05$). The number of individuals in Biłgoraj preferring red meat was statistically significantly higher (69%) in comparison with group A – 30.7% ($p<0.05$). Moreover, statistically significant differences were observed in poultry and fish intake. The inhabitants of Lublin preferred poultry (69.3%), while those of Biłgoraj more often (at least once a week) consumed fish ($p<0.05$). No statistically significant differences were found in the intake of vegetables and fruits. In both groups, the responders (in group A – 52.5%; in group B – 48.7%) consumed vegetables and fruits every day, including raw ones consumed at least once a day by 33.7% of the Lublin inhabitants and 30.1% of the Biłgoraj inhabitants. No statistically significant differences were observed in the intake of wholemeal bread, groats and legumes. 44.5% of group A responders and 50.4% of group B responders admitted to having these products less frequently than 5 times a week. The comparative analysis did not demonstrate significant differences in the intake of sweets. Up to 69.3% of the Lublin responders and 65.5% of Biłgoraj inhabitants admitted to sweet snacks between meals. In both groups olive oil and plant oil were used for frying, in group A – by 100% of responders and in group B – by 92.0% ($p<0.05$). The inhabitants of Lublin (40.6%) more often used ready-made meals and fast food compared to those of Biłgoraj – 27.4% of the population ($p<0.05$). In both groups the main consumers of fast food were between the ages of 21 and 30. There were no statistical differences found in the frequency of cigarette smoking; 31.7% of the Lublin responders and 34.5% of the Bilgoraj ones admitted to smoking 20 cigarettes a day. The majority of Lublin inhabitants (67.3%) thought that their knowledge about nutrition was sufficient, while in group B only 46.9% ($p<0.05$). The main source of dietary information for the biggest group of responders was television and press, followed by family and friends. No significant differences were found in leisure activities. In Lublin, 52.5% and in Biłgoraj 42.5% of responders admitted to relaxing passively, most often sleeping or watching TV. In group A, 24.7% of responders suffer from cardiovascular diseases, diabetes and osteoarticular diseases, which is statistically significantly more than in group B ($p<0.05$) and concerns mainly individuals over 60 years of age.

Table 1. Distribution of answers concerning evaluation of nutrition and other forms of behaviour according to the place of residence (%)

Parameter examined	Adult population Lublin (%)	Adult population Biłgoraj (%)	Significance of statistical differences
Number of meals: 4–5 3	 44.5 55.4	 61.1 38.9	P<0.05
Breaks between meals: 4–5 h	66.3	67.3	p>0.05
Regular meal consumption	46.5	18.6	P<0.05
Meals with animal proteins: in 75% of meals in less than 75%	 38.6 61.4	 81.4 18.6	P<0.05
Intake of milk and its products: every day	35.6	51.3	P<0.05
Intake of vegetables and fruits: every day 5 times a week less frequently	 52.5 34.6 12.9	 48.7 38.0 13.3	p>0.05
Intake of raw vegetables and fruits: every day 5 times a week less frequently	 33.7 27.7 33.6	 30.1 40.7 29.2	p>0.05
Intake of whole-meal bread, groats and legumes: every day 5 times a week less frequently	 21.8 33.7 44.5	 15.9 33.6 50.4	p>0.05
Fish intake: at least once a week	71.3	88.5	P<0.05
Kinds of mea preferred: red meat poultry	 30.7 69.3	 69.0 31.0	P<0.05
Fats used for frying olive oil and other oils	100.0	92.0	P<0.05
Sweet snacks between the meals: yes	69.3	65.5	p>0.05
Consumption of ready-made dishes and fast food yes	 40.6	 27.4	P<0.05
Cigarette smoking: yes	 31.7	 34.5	p>0.05
Leisure time activities: passive	52.5	42.5	p>0.05
Knowledge about nutrition: sufficient	67.3	46.9	P<0.05
Health state: ill including cardiovascular diseases	 44.5 24.7	 23.0 10.6	P<0.05

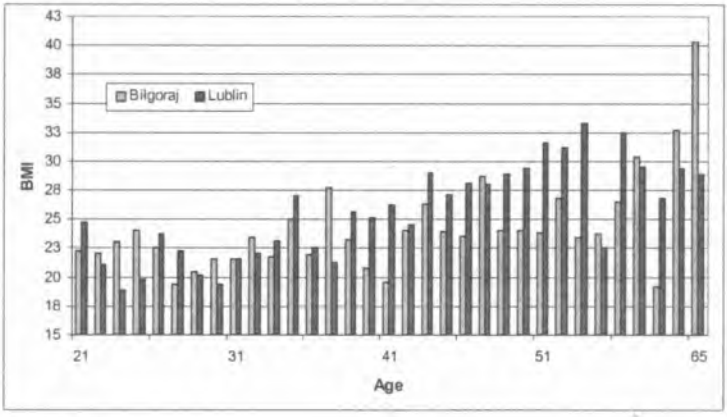

Fig. 1. Comparison of BMIs in women from Lublin and Biłgoraj

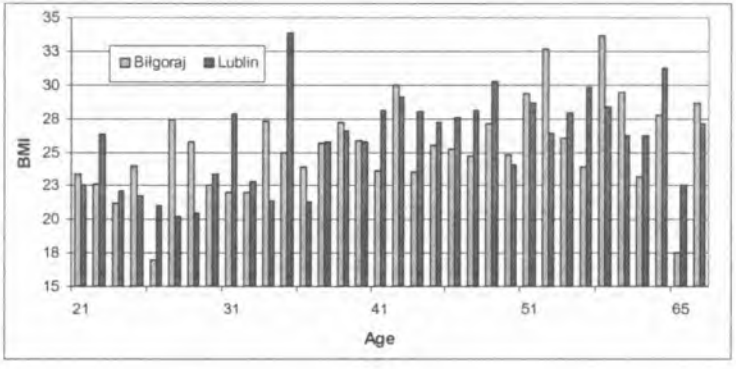

Fig. 2. Comparison of BMIs in men from Lublin and Biłgoraj

DISCUSSION

The nature and way of nutrition of adults are affected by many factors which include dietary habits acquired in adolescence, kind of job (physical or mental) and environment.

The results of the questionnaire indicate that proper body mass is observed in 44% of the population A and 47% of the population B. The remaining group includes mainly overweight individuals between the ages 41 and 50 and obese people aged 51–60. The study demonstrates that excessive body mass increases the risk of various diseases (diabetes, coronary disease) and deteriorates the course of existing diseases and body abilities. Abdominal obesity of „an apple type" connected with excessive abdominal fatty tissue is most dangerous for health (2). An important condition for maintaining health and fitness is the frequency of intake of rational meals. In the adult nutrition the number of meals should not be lower than 3 as too long breaks between meals reduce the blood glucose level, which in turn results in hunger. Hunger and fluid deficiency reduce concentration abilities, limit psychophysical activity and deteriorate mood (7). In the population examined, 38.9% of the group B and 55.5% of group A stated the intake of 3 meals and the remaining of 4–5 meals. The intake of protein meals in all main meals is an extremely important feature of proper nutrition. In adults at least 1/3 of protein should be derived from animal products (4). It was demonstrated that the examined Biłgoraj inhabitants more often

consumed animal protein-containing products than the Lublin inhabitants. The frequency of consumption of milk and its products in the populations examined varied. Milk and its products were consumed every day by 51.3% of the Biłgoraj adults, while 64.4% of adults from Lublin had them every other day or more rarely. This indicates that not all individuals know the advantages of milk. Milk is one of the most nutritional products, an important calcium source, in particular. The majority of other nutrients contained in it may be easily obtained from other products. Calcium ensures healthy, strong bones and is responsible for proper dentition. It should be remembered that insufficient calcium intake is likely to lead to osteoporosis in the older age (9). The analysis of the frequency of consumption of such products as raw vegetables and fruits, whole-meal bread, groats and legumes demonstrates a very rare presence of these products in diets of both populations, which is extremely unfavourable due to a low diet content of vitamins, mineral salts and dietary fibre, which are essential for the prevention of cardiovascular and neoplastic diseases. Similar results about the frequency of intake of milk and its products, fruits, vegetables and wholemeal bread were obtained by Kozłowska-Wojciechowska (6). According to the authors, the lack of basic and extremely important products in our diet indicates that our society does not understand the need of prophylactic actions regarding themselves.

Moreover, extremely alarming is the fact that the majority of responders from Biłgoraj still prefer red meat, which is the source of fatty acids and cholesterol. A positive fact is that the majority of both populations consume fish and use plant fats at least once a week, which is vitally important for prophylaxis. The results obtained, in Lublin population in particular, also show how often we use ready-made and fast food just to make the preparation of meals easier. Ready-made dishes spare time; however, their nutritional value cannot compete with home-made meals. Fast-food dishes usually do not contain fresh fruits and vegetables but a lot of fats, salt and sugar. Therefore, such meals – not supplemented with the lacking components of balanced diet – increase the risk of obesity and obesity-related disorders such as coronary heart disease or neoplasms.

Bad dietary habits also include snacks between meals, e.g. cakes, sweets, before for example the main meal, particularly dinner or supper (3). The study showed that almost everybody had snacks. In the studies by Kołłajtis-Dołowy (5), 2/3 of responders had snacks between meals, which was statistically significantly correlated with body mass changes. The author demonstrated that every second individual whose body mass increased in the period of 1–2 years snacked and over 55% of those who lost weight almost never snacked.

The obtained results show that the majority of responders in populations A and B watch TV in their spare time. Generally, people know that physical efficiency is important, but not all of them understand its value. Although the majority of us are aware of this we find it difficult to get around finding various excuses: lack of time, too much work or poor condition. Different types of exercises increase the efficiency of the heart and lungs, strengthen muscles, improve the posture and figure and positively affect the general feeling, enable relaxation, facilitate sleep and successfully counteract stress. The source of dietary information for the relatively biggest group of responders was television and press, followed by family and friends. The above mentioned findings show that long-term bad nutrition leads to latent or overt disorders, which is reflected in the results concerning the diseases of our responders, over the age of 60, in particular. The highest number of ill responders was found in Lublin; the diseases mainly included cardiovascular and osteoarticular ones and diabetes, which undoubtedly is strongly related to long-term inadequate nutrition and unhealthy life-style. Similar results were obtained by Bartoszek (1) and Ostrowska-Ogórek (8), who analysed the health state of women aged 60–89. The studies showed that 56.6% of them had cardiovascular diseases, 30.6% – oesteoarticular diseases while 15.3% suffered from endocrine disorders, e.g. diabetes.

CONCLUSIONS

1. Nutrition of inhabitants of Lublin and Biłgoraj does not fulfill the principles of rational diet.
2. The frequency of intake of raw vegetables and fruits, wholemeal bread and legumes was improper irrespective of the place of residence.
3. The small town population still prefer red meat in its diet, while in the big town the intake of milk and its products is too low, which may lead to osteoporosis.
4. The frequency of snacks between meals is independent of the place of residence.
5. An excessive intake of ready-made dishes and fast food is characteristic of a big urban agglomeration.
6. Cardiovascular diseases, diabetes and osteoarticular diseases detected are likely to result from improper nutrition and lack of physical activity.

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SUMMARY

The paper presents a comparative analysis of the way of nutrition of inhabitants from a big urban agglomeration, i.e. Lublin (101), and small town inhabitants of Biłgoraj (113), focusing on qualitative evaluation of nutrition and most common dietary errors which may affect current health state or endanger future health. The dietary habits were assessed using the $\div^2$ homogeneity test. Moreover, the examined population underwent mass and height measurements and the results were compared with BMI. The study demonstrates that the way of nutrition of Lublin and Biłgoraj populations does not fulfill the requirements of a rational diet: very frequent snacks, excessive use of ready-made dishes and fast food and very low intake of raw vegetables and fruits, wholemeal bread and legumes.

Ocena sposobu żywienia dorosłej populacji Lublina i Biłgoraja

W pracy przedstawiono analizę porównawczą sposobu żywienia ludności pochodzącej z dużej aglomeracji miejskiej, tj. miasta Lublina (101 osób), oraz ludności małomiasteczkowej żyjącej w

Biłgoraju (113 osób), ze szczególnym uwzględnieniem jakościowej oceny odżywiania się badanego społeczeństwa, wskazaniem najczęściej popełnianych błędów żywieniowych, mogących mieć wpływ na stan obecnego zdrowia oraz zagrażających zdrowiu w latach następnych. Do oceny zwyczajowego sposobu żywienia zastosowano metodę ankiety anonimowej. Uzyskane wyniki badań poddano analizie statystycznej za pomocą testu jednorodności ch2. Badaną populację poddano ponadto pomiarom masy i wysokości ciała, a uzyskane wyniki porównano ze wskaźnikiem Queteleta (BMI). W pracy wykazano, że sposób odżywiania ludności Lublina i Biłgoraja nie spełnia wymagań zasad racjonalnego żywienia, stwierdzono zwłaszcza bardzo częste podjadanie między posiłkami, nadmierne korzystanie z dań gotowych oraz żywności typu *fast-food*, jak również bardzo niskie spożycie surowych warzyw i owoców, pieczywa razowego i nasion roślin strączkowych.