NUTRITIONAL STATUS AND DIETARY HABITS OF HIGH SCHOOL AND COLLEGE STUDENTS

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Abstract: This paper discusses the issues of nutritional status and dietary habits in adolescence. The main goal of the survey was to determine whether the nutritional status of today's adolescents is satisfactory for this age group. The study used a questionnaire approach, complemented by anthropometry. A total of 1,020 students aged 15-20 from high schools and colleges in East Bohemia participated in the project.

Keywords: overweight, obesity, adolescents, nutritional status, dietary habits

Theoretical Background

The issues of nutrition and dietary habits are timely because nutrition plays an important part among the external environmental factors that may impact the health of an individual or the entire nation. A special situation arises in adolescence due to greater physiological need for food of high nutritional value. Obesitologists agree that there is a high probability that the youngsters who develop good eating habits in early childhood, and keep them into adulthood, will have a lower risk of chronic diseases that are, in some degree, related to food intake (such as atherosclerosis, diabetes mellitus, or osteoporosis).

With increasing frequency we now encounter imbalance in the nutritional state of individuals that manifests itself in eating disorders resulting in overweight (obesity) or, conversely, underweight (cachexia).

The main cause of obesity is the discrepancy between the intake of food and the output of energy. To a much lesser extent, contributory factors in the development of obesity may include endocrinopathies (e.g. hypothyroidism or hypopituarism), Mendelian hereditary syndromes (e.g. Prader-Willi syndrome or Bardet-Biedel syndrome), gene mutation (e.g. leptin receptor gene mutation), a malfunction of the hypothalamic-pituitary system (e.g. leptin deficiency, Fröhlich syndrome, inflammation, tumors) or the consequences of taking certain drugs (e.g. psychotropics or corticoids). Also rising is the number of adolescents who are underweight to cachexic because of insufficient nutrition, inappropriate dieting, eating disorders (e.g. anorexia nervosa), the effects of oncology treatment or hospitalism.

Research Objective

The purpose of this research was to assess the nutritional status and dietary habits among 15-20 year old students. The nutritional level of students' eating habits was evaluated by comparing the two groups of adolescents on the basis of differing body mass index (BMI).

Research Methodology

The research part of the study intended to explore the area of nutritional status and eating habits. To collect the relevant data, we used the questionnaire method in combination with anthropometric measurements of weight, height and body fat. The measurements were taken on 1,020 students, who then completed a questionnaire about their physical activities. All questionnaires came back properly filled. The data were entered into charts showing the relative (%) values of key indicators in the two monitored groups. Statistical significance was checked by the chi-square test for goodness of fit.

The sample consisted of 1,020 respondents, 15-20 years old. They were high school students from the Pardubice and Hradec Králové areas and college students from the whole Czech Republic. In total, 835 boys and 185 girls took part in the survey. After handing out the questionnaire, we acquainted the respondents with the purpose of our work and briefly instructed them how to fill in the form. They had 25 minutes to do that.
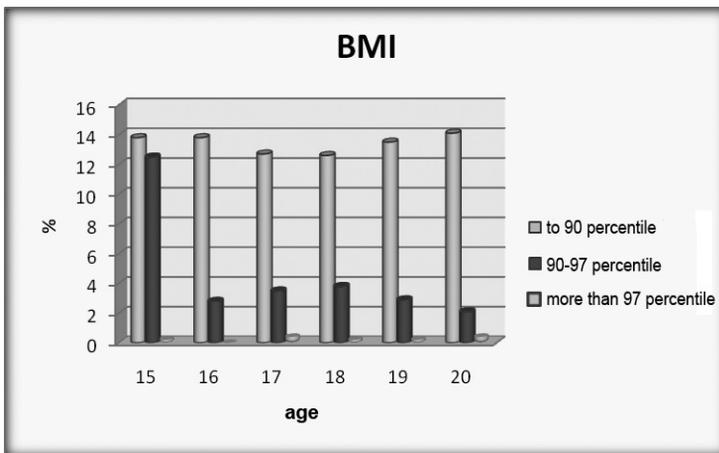
Interpretation of Results

Fig. 1: Graphic representation of BMI by age

In percent of all measured, the largest underweight portion was in the 15-year old group (1.5 %) and the 16-year old group (1.5 %), the largest portion in the normal weight category was in the 20-year old adolescents (13.7 %), and the largest portion in the overweight category (4.0 %) were the 18-year old adolescents. The largest portion

in Level I obesity (0.4 %) was among the 17-year old adolescents, the largest portion in Level II obesity was in the 17-year old and 20-year old groups (both 0. 2 %), and the only recorded values of Level III obesity were in the 20-year old adolescents (0.2 %). These numbers are irrespective of gender. Fig.1 shows the distribution graphically. The average BMI was 22.1 for girls and 23.1 for boys.
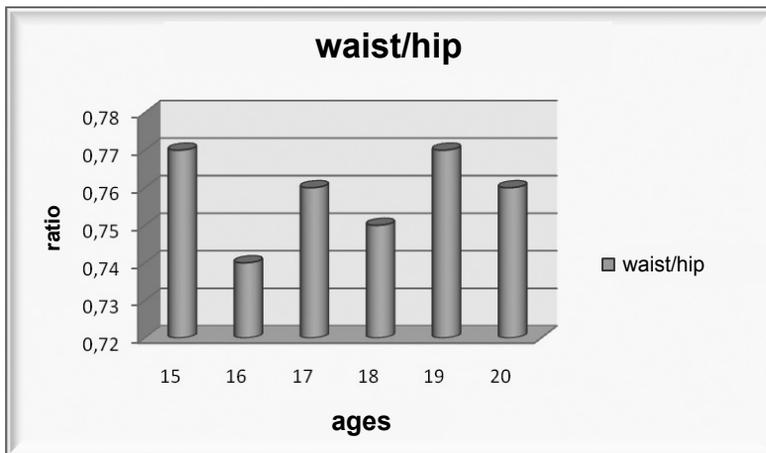

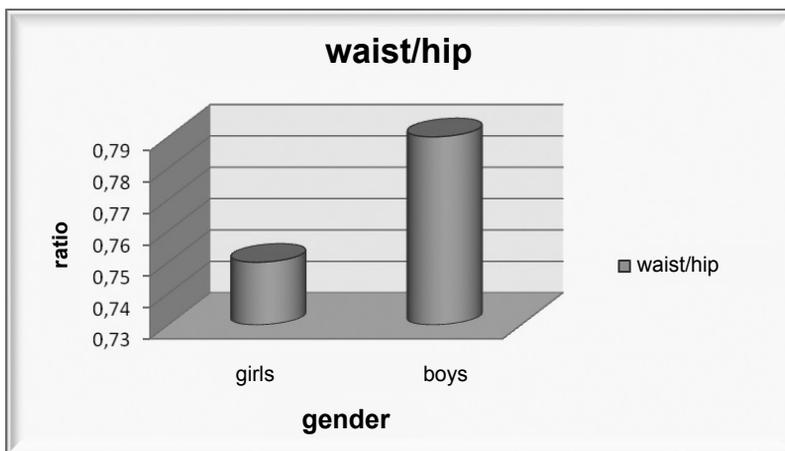Fig. 2: Graphic representation of waist/hip ratio by age group

Fig. 3: Graphic representation of waist/hip ratio by gender (girls/boys)

The mean waste/hip ratio (WHR) was 0.758 (median 0.76). The highest mean WHR index was noted in 15 and 19 years old adolescents, the lowest mean WHR index was found in the group of 16-year olds. Fig.2 shows the results graphically.

The mean WHR in girls was 0.75 (median 0.74) and 0.79 in boys (median

0.79), see Fig. 3. The boys had a higher mean WHR index. The lowest WHR index (0.6) was recorded for a girl and the highest (0.99) for a boy.
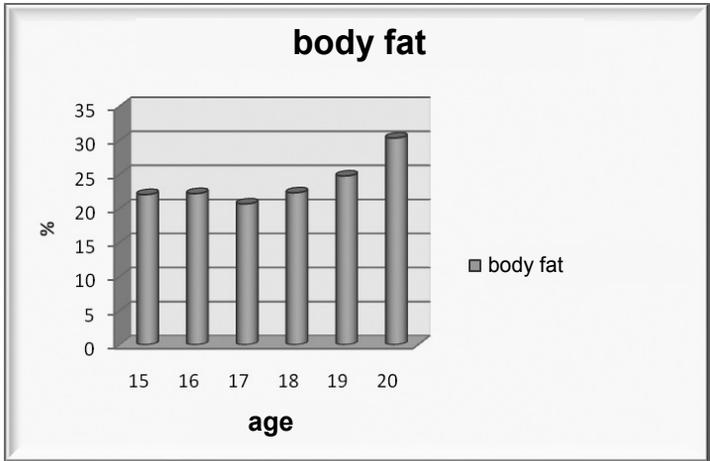
body fat

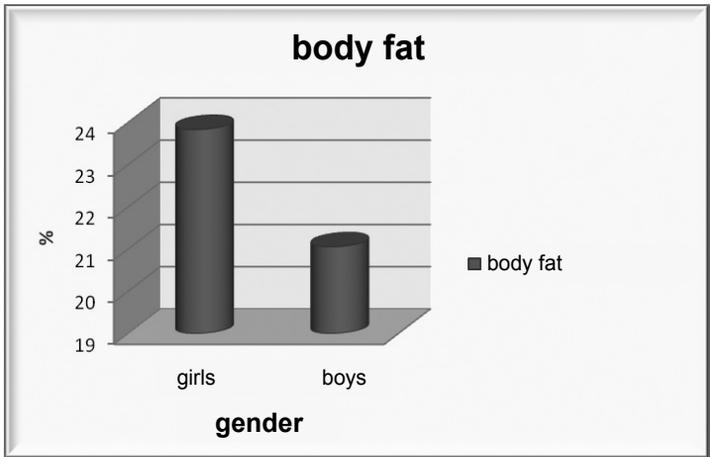Fig. 4: Graphic representation of body fat by age

body fat

Fig. 5: Graphic representation of body fat by gender (girls/boys)

The average amount of body fat in adolescents was 23.71 % (median 21.85 %). The lowest body fat values (20.67 %) were measured in groups of 17-year old adolescents, while the highest values of 30.34 % were found in the 20-year old group, irrespective of gender. The results indicate that the percentage of body fat increases with age. The exception was the group of 17-year old adolescents which consisted mostly of boys who typically have less fat tissue (approximately 20 %). The average amount of body fat in percent for different age groups is shown in Fig. 4.

The average amount of body fat was 23.84 % in girls (median 24) and 21.06 %

(median 20) in boys, see Fig. 5. The highest value, 50.6 %, was recorded for a girl, while the maximum value for boys was 38.9 %.
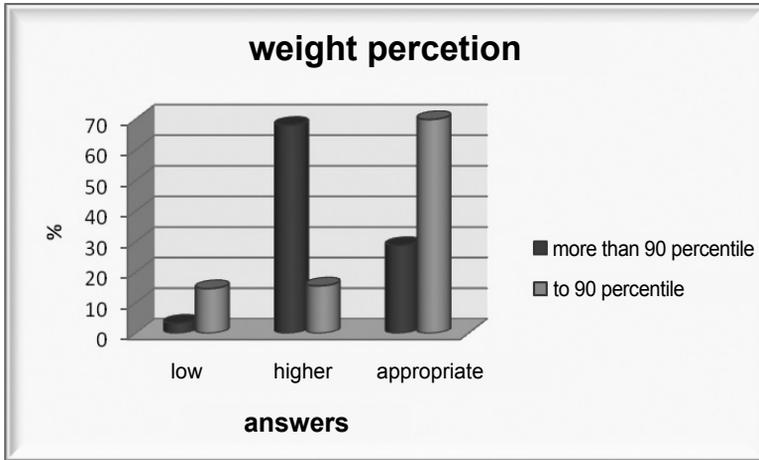

Fig. 6: Graphic representation of weight perception (low/higher/appropriate)

The results indicate that, in general, adolescents have an adequate perception of their body weight, because of those above the 90th percentile in BMI, 68 % perceived their body weight as higher, 28.7 % as appropriate, and 3.3 % as lower. Likewise, 69.9 % of those within the 90th percentile in BMI perceived their weight as appropriate, 15.5 % as higher and 14.6 % as lower. The resultant value was p=3.405x10⁻ which is a confirmation that a statistically significant difference exists between the two groups. The adolescents with the BMI above the 90th percentile perceive their weight more realistically.

Fig. 7: Graphic representation of numbers of adolescents observing a diet (yes/no)

When surveyed, 42.7 % of adolescents within the 90th percentile in BMI and 21.6 % of those above the 90th percentile followed a certain diet (see Fig. 7). The results indicate that more respondents on a diet were from the group above the 90th percentile. A significant difference between the two groups of adolescents has been has been confirmed statistically, resulting in $p=5.9 \times 10^{-10}$.
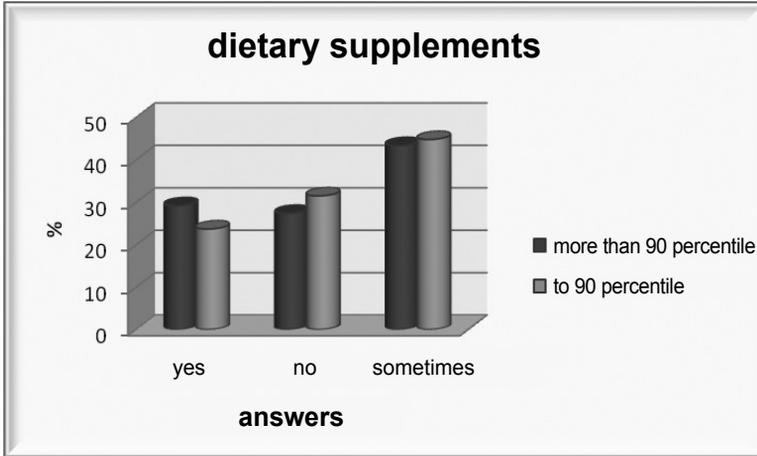
dietary supplements

%

answers

Fig. 8: Graphic representation of adolescents' use of dietary supplements
(yes/no/sometimes)

When the adolescents with the BMI above the 90th percentile were asked about taking supplements (see Fig. 8), 29.2 % responded yes, 27.4 % no, and 31.5 % sometimes. The results for adolescents within the 90th percentile were similar. The yes option was chosen by 23.7 %, no by 31.5 %, and sometimes by 44.8 % of the respondents in that category. In this case, a statistically significant difference between the two groups was not confirmed. The resultant value was $p=0.2323$.

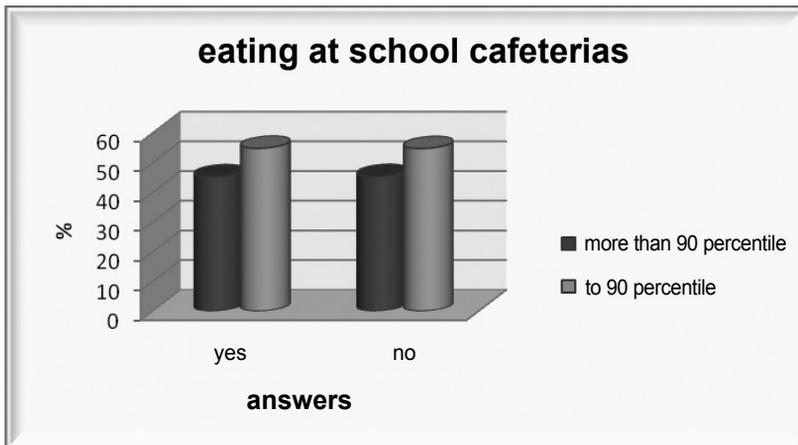**eating at school cafeterias**

%

answers

Fig. 9: Graphic representation of eating at school cafeterias

A total of 45.2 % of adolescents with the BMI above the 90th percentile and 45.3 % of those within it eat lunch in a school cafeteria (see Fig. 9). The results indicate that more than half of the adolescents take their meals elsewhere: at home, in a restaurant/bistro, or they do not eat lunch at all. The difference between the individual categories is minimal and there is no statistically significant difference between the two groups. The resultant value was p=0.8734.
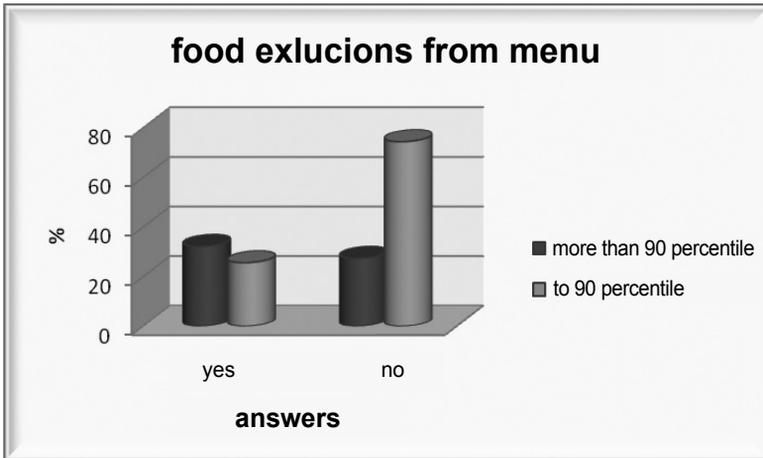

Fig. 10: Graphic representation of food exclusions from adolescents' menu

From all interviewed adolescents (see Fig. 10), 32.1 % of those with the BMI above the 90th percentile deliberately excluded certain foods from their menu, as opposed to 25.6 % of those within the 90th percentile. The statistical test did not find a significant difference between the two groups, the resultant value being p=0.07364.

Among the most commonly excluded foods were mushrooms, soy, fatty meats, nuts, spinach, offal, sweets, etc.
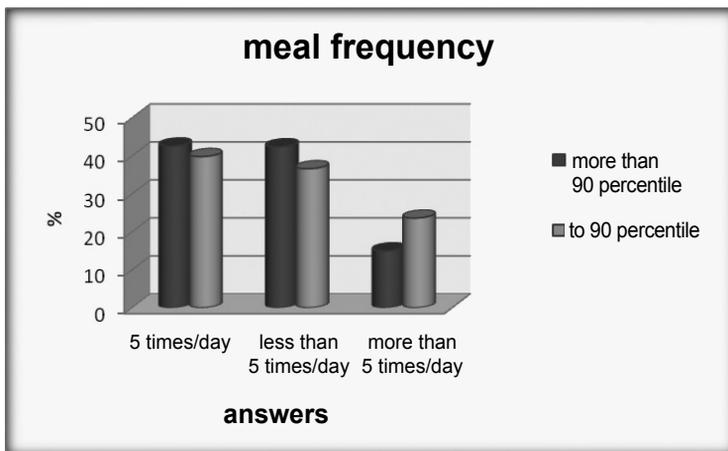

Fig. 11: Graphic representation of adolescents' main meal frequency

The results in Fig. 11 indicate that of the adolescents with the BMI within the 90th percentile, 39.8 % consume food 5 times/day, 36.6 % less than 5 times/day, and 23.6 % more than 5 times/day. Of the adolescents above the 90th percentile, 42.6 % take food 5 times/day, 36.6 % less than 5 times/day, and 15 % more than 5 times/day. Statistical analysis found a significant difference between the two groups. In the categories of 5 and less than 5 times/day, the adolescents with the BMI above the 90th percentile scored better. The resultant value was p=0.03939.
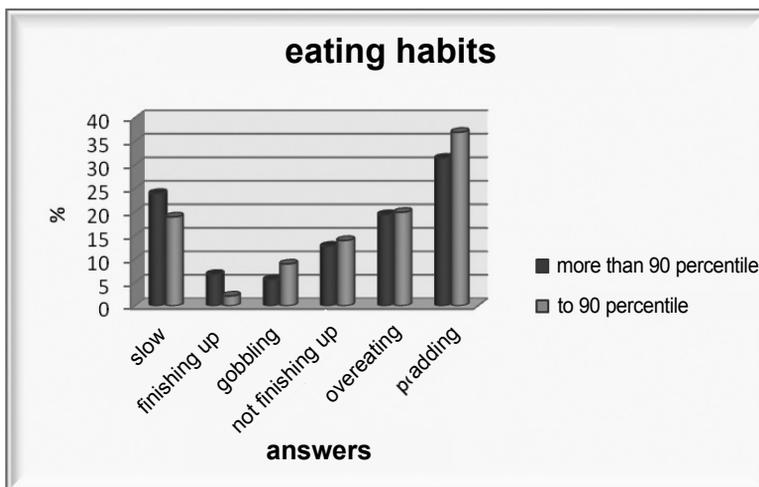

Fig. 12: Graphic representation of adolescents' eating habits

In the category with the BMI above the 90th percentile, eating habits occur in the following order: slow (36.4 %), finishing up (23.9 %), gobbling (19.4 %), not finishing up (12.7 %), overeating (6.7 %), adding (5.6 %). In the category within the 90th percentile, the habits rank as follows: slow (36.4 %), gobbling (19.8), finishing up (18.9 %), not finishing up (13.9 %), adding (8.9 %), overeating (2.1 %) (see Fig. 12).

Discussion and Conclusion

The results show, in comparison with other studies, that overweight and obesity in fact begin already in the adolescent age. Some adolescents who have reached the BMI of 25 would be better categorized as marginally overweight, because these were mostly boys – strongly built athletes with body fat still within the norm. It is possible that some respondents in the marginally overweight category, after some additional measurements like skin folds, would fit better into the normal weight category. However, the increase also appears in the underweight band, by our observations amounting to 9 % (underweight is more common in girls). In terms of gender, boys tend to get obese more often than girls (but it is essential to differentiate between obesity and a robust figure).

It is good that nearly 70 % of both groups of adolescents perceive their weight appropriately. Almost 43 % of overweight adolescents have tried to go on a diet at some time, but the question is how long can heavier children stay on an intervention

program. In general, girls tend to overestimate, and boys underestimate, their weight. Over 30 % of adolescents exclude certain foods from their menu. Possible reasons may include food allergies or children's greater pickiness. In this age category, around 50 % of students eat their lunch in a school cafeteria, which is about 10-20 % fewer than the children in elementary schools.

The results of the survey also reveal that there is a large reserve in the area of correct adolescent nutrition. If we want to arrest the trend of increasing weight, or even reverse it in obese individuals, then these people need an opportunity to learn. Naturally, the family, and mother especially, have a major role to play. A pediatrician's involvement is also important. Educational institutions, inside or outside of school, can certainly have a positive effect when it comes to nutrition and exercise. For example, schools can influence individuals through subjects like Health Education or Physical Education, or through cross-curricular relationships among basic school subjects.

Literature

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VÝŽIVOVÝ STAV A STRAVOVACÍ ZVYKLOSTI STUDENTŮ STŘEDNÍCH A VYSOKÝCH ŠKOL

Abstrakt: Příspěvek popisuje problematiku výživového stavu a stravovacích návyků v adolescenci. Hlavním cílem šetření bylo zjistit, zda je výživový stav dnešních adolescentů dostatečný pro danou věkovou skupinu. Ve výzkumu byla použita metoda dotazníkového měření, doplněná antropometrickou metodou. Celkově se výzkumu zúčastnilo 1020 studentů středních škol a univerzity ve věku 15-20 let z Východních Čech.

Klíčová slova: nadváha, obezita, adolescenti, výživový stav, stravovací zvyklosti