

DIET AND PARTICIPATION OF FOOD OF ANIMAL ORIGIN IN STUDENTS' NUTRITION¹

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ABSTRACT

For students, nutrition is of primary importance because during adolescence the qualitative and quantitative needs for a well-balanced diet, are bigger than during any other period of life. Numerous reports in Serbia, talk about students health problems because of the incorrect diet, such as anemia, malnutrition, and obesity. The aim of this paper is to evaluate the diet, the frequency of weekly intake of foods of animal origin and the Body Mass Index. A survey was conducted between students of all study groups and all the years, a total of 133 respondents. The state of nutrition of students is significantly related to the intake of certain foods of animal origin. Chicken is significantly less represented in the diet of overweight students, opposite to other meat (except fish and chicken) that is more represented in both sexes. There is no significant correlation between nutrition status and diet.

KEYWORDS: students, diet, foods of animal origin

INTRODUCTION

Foods of animal origin are an important source of high-value proteins, minerals and vitamins. Red meat contains significant quantity of saturated fat, and eggs contain cholesterol, and it is recommended to limit the intake of these foods in adults. Although the International Agency for Research on Cancer classified red

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meat as "probably carcinogenic", and meat products as "carcinogenic" for humans, numerous studies indicate the need to clarify the mechanisms by which red meat and meat products are involved in carcinogenesis (Domingo, 2017). Some studies have shown that optimal intake of unprocessed lean red meat does not pose a risk for the development of cardiovascular diseases and colorectal carcinoma (Kappeler, 2013). However, the intake of meat products (sausage, bacon, etc.) represents a risk for the development of colorectal carcinoma (Demeyer, et al., 2016). Meat is the source of an absolutely usable, bivalent iron, that the human body best recognizes and uses.

For students, as a special population group of young people, nutrition is of primary importance because qualitative and quantitative needs for a well-balanced diet, are bigger than in any other period of life, since nutrition must be adapted to long-lasting intellectual work and that their development process has not yet been completed. (Đurić, 2013) Numerous reports in our country show how the student population in Serbia often suffers from health problems caused by irregular nutrition, such as anemia, malnutrition and obesity (Petrović, 2003; Sokolova 2013) General situation, regarding food intake and nutritional status of young people in the countries of Central and Eastern Europe, has significantly differed over the past decades. Food is characterized by too much protein, fat and sugar, and a few milk products, similar to the United States. This is also due to the lower prices of foodstuffs in Eastern Europe (Moreno, 2010; Parízková, 2000). Young people tend to skip breakfast. The results of the research in Greece, suggest that the habits in the diet of young people are in the process of transition from more traditional to western ones. (Yannakoulia, 2004) Research in Portugal says there has been a change in Mediterranean diet, have increased consumption of saturated fatty acids and high carbohydrate levels and there is a risk of lack of calcium, iron and zinc. Serum cholesterol levels in young people in Spain, Greece and Italy have increased in the last two decades and are similar to those in the United States (Wahl, 1999; Naeeni, 2014).

Aim

The aim of this paper is to evaluate the diet and the frequency of weekly intake of foods of animal origin among students in relation to the Body Mass Index.

Method

Within the international research, the factors influencing the lifestyle of the youth population, realized in 3 neighboring countries, Serbia, Bosnia and Herzegovina and Macedonia and 6 higher education institutions, were conducted among the students of the College of Vocational Studies for Education in Subotica in March and April 2016. The survey included students from all study groups (educators, trainers, nutritionists, dieticians and nurses) and all the years of study. A standard survey questionnaire from the National Health Survey of Serbia 2006 and 2013 (Institute of Public Health of Serbia, 2013) was used as a research instrument.

The data are presented using descriptive statistics. To determine the relationship between weekly intake of foods of animal origin and body mass index in the total sample and by sex, the chi-square test, or SPSS 18. software, was used. The values of $p < 0.05$ were considered statistically significant differences.

Results and discussion

The survey included 133 respondents, 81.2% (88) of whom were male and 18.8% (25) female. The respondents aged 19-20 years were 57.1% of the sample. The respondents aged 21-30 years were 28.6%, and subjects older than 30 years were 14.3% of the sample. The highest percentage of pre-emptive and obese subjects in the category of 30 years of age or over. The use of the chi-square test showed a statistically significant difference in the level of malnutrition of male and female sex workers ($\chi^2 = 19.10$; $p = 0.000$) as well as subjects of different age groups ($\chi^2 = 13.38$; $p = 0.037$).

More than half of the respondents (53.4%) said they often have breakfast, while 7.5% of the respondents said they rarely have breakfast. Most respondents (89.5%) said that they often have lunch, while 10.5% of respondents said they have lunch sometimes. Most respondents (59.4%) said that they often have dinner, 37.6% have dinner sometimes, while 3% of respondents said they never have had dinner. In this study, there was no significant association between diet and nutritional status.

Analyzing the frequency of consumption of dairy products on a weekly basis, it was concluded that two cups of milk, yogurt or sour milk were consumed daily by only 10.6% of the respondents in this study, while cheese was consumed daily by 5.3% of the respondents.(Table2)

About half of the respondents in this study reported that they consume fish twice a week, while more than a third of the examinees said they never eat fish.

These results indicate that chicken and other meat are equally represented in the nutrition of the respondents who participated in this study, where chicken is more present in the diet of female respondents, while the other meat is more present in the diet of male respondents. Weekly intake of chicken proved to be significantly related to the state of nutrition of the respondents. Chicken is the most prevalent in the diet of normally overweight respondents, while a quarter of respondents said they would never eat chicken consisted of overweight respondents. This difference is significantly reflected in female respondents. (Table 3)

The use of the hi-square test ($\chi^2 = 19.76$; $p = 0.019$) revealed significant differences in weekly intake of chicken relative to the state of nutrition. 25% of respondents who said they never consumed chicken were in the category of overweight, while 84.6% of the respondents who said they were consuming chicken 6-7 times a week were normally in the category of normal feeding.

Significant differences were found among male respondents ($\chi^2 = 9.57$; $p = 0.048$) in weekly intake of other meat (except chicken and fish) and meat products compared to nutritional status. Among the respondents, who used meat 6-7 times, 75% were overweight, 25% obese, and 0% were naturally fed, and those who bring meat products 6 to 7 times a week are 100% obese. 75% of those who do not eat meat products are normalized.

According to the results of this research, breakfast and evening meals are more often skipped. More than half of the respondents often have breakfast. Numerous studies have shown that the consumption of multiple meals throughout the day is associated with lower body mass index values (Franco, 2008; Louis-Sylvestre, 2003)

Meat, fish and eggs represent a groups of foods, which is an important source of high value proteins, minerals (iron, zinc, magnesium). It is recommended to consume fish at least once a week, more frequent intake of chicken meat in relation to red meat and avoiding the input of meat products. (Carr et al., 2016) About half of the respondents consume fish twice a week, and more than one third of the examinees never consume. Insufficient fish intake is confirmed by national research, according to which only 12.5% of Serbian citizens consume fish at least twice a week (Institute of Public Health of Serbia, 2013). The other half consumes chicken 3 to 5 times a week, more girls. About the same number of respondents said that 3 times a week consumed other meat (except fish and chicken), more men. Weekly intake of chicken proved to be significantly related to the state of nutrition of the respondents. Chicken was the most prevalent in the diet of normally nourished respondents. All male respondents who were told to consume other flesh were 6-7 times a week overweight or obese subjects. A link with the nutrition status of male examinees showed a weekly intake of meat products. Those respondents who never consume meat products are normally nourished, while those who consume meat products 6 to 7 times are obese. The results obtained by this study confirm the results of other studies that indicate a positive correlation between total intake of meat and obesity, most likely due to higher total energy input. (Wang, 2009)

Conclusion

The state of nutrition of the student population, the subject of our research, is significantly related to the input of certain foods of animal origin. Chicken is not consumed by excessively nourished respondents, especially not by female students. In the diet of over-nourished students, other meat and meat products are significantly more represented. There is no significant correlation between nutrition status and diet. Breakfast and dinner are meals that are more often skipped. Since data on the state of nutrition are based on the self-assessment of the respondents, it is possible that bias and nonobjectivity in giving data on body height and weight could have an impact on the results obtained. It is necessary to extend this and similar research (total number of meals, food preparation methods, meal consumption at home and out of house, the influence of layout of students' obligations on the way and frequency of food intake, nutrition information, etc.) in order to have a more accurate picture of a comprehensive culture feeding young people from us.

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Table 2.
Weekly intake of milk, yogurt, sour milk and cheese in the total sample of respondents and by sex

Products	Never	Sometimes	Every day 1 cup	Every day 2 cup	In total
Milk, yogurt, sour milk					
Male	4.2% (1)	41.7% (10)	25.0% (6)	29.2% (7)	100% (24)
Female	1.9% (2)	59.3% (64)	32.4% (35)	6.5% (7)	100% (108)
In total	2.3% (3)	56.1% (74)	31.1% (41)	10.6% (14)	100% (132)
Cheese	Never	2 times	3-5 times	6-7 times	In total
Male	4% (1)	52% (13)	36% (9)	8% (2)	100% (25)
Female	22.2% (24)	47.2% (51)	25.9% (28)	4.6% (5)	100% (108)
In total	18.8% (25)	48.1% (64)	27.8% (37)	5.3% (7)	100% (133)

Table 3.
Weekly intake of fish, eggs, chicken, other meat and meat products in the total sample and by gender

Products	Never	2 times	3-5 times	6-7 times	In total
A fish					
Male	36% (9)	48% (12)	16% (4)	0%	100% (25)
Female	29.3% (42)	51.4% (55)	8.4% (9)	0.9% (1)	100% (107)
In total	38.6% (51)	50.8% (67)	9.8% (13)	0.8% (1)	100% (132)
Eggs					
Male	16% (4)	36% (9)	36% (9)	12% (3)	100% (25)
Female	14.2% (15)	54.7% (58)	25.5% (27)	5.7% (6)	100% (106)
In total	14.5% (19)	51.1% (67)	27.5% (36)	6.9% (9)	100% (131)
Chicken					
Male	4% (1)	52% (13)	40% (10)	4% (1)	100% (25)
Female	6.5% (7)	33.3% (36)	49.1% (53)	11.1% (12)	100% (108)
In total	6% (8)	36.8% (49)	47.4% (63)	9.8% (13)	100% (133)
Other meat					
Male	0%	44% (11)	40% (10)	16% (4)	100% (25)
Female	10.5% (11)	30.5% (32)	41.9% (44)	17.1% (18)	100% (105)
In total	8.5% (11)	33.1% (43)	41.5% (54)	16.9% (22)	100% (133)
Meat products					
Male	16% (4)	44% (11)	32% (8)	8% (2)	100% (25)
Female	30.8% (32)	42.3% (44)	21.2% (22)	5.8% (6)	100% (104)
In total	27.9% (36)	42.6% (55)	23.3% (30)	6.2% (8)	100% (129)