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DIFFERENCES IN CONSUMPTION OF MILK AND DAIRY PRODUCTS IN ADOLESCENT DIET ACCORDING TO THE GENDER AND THE PLACE OF RESIDENCE

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Summary

There is accelerated growth in adolescence, increase of muscle mass, the maturation and increased physical activity. Milk is a complete food which contains many nutrients and meets needs for calcium, magnesium, selenium, riboflavin, vitamins B12 and B5. The protein in cow milk is of high-quality (defined as protein that supports maximal growth), containing a good balance of all the essential amino acids, including lysine. Because of the above mentioned a survey has been conducted about the consumption of milk and dairy products among adolescents in the Canton of Sarajevo. The study included 630 participants, 60 boys and 73 girls from the rural and 264 boys and 233 girls from the urban part of the Canton of Sarajevo. The participants were 13-15 years old. The used questionnaire is classified as a semi-quantitative, which involves the amount and the frequency of consumed foods and which represents a modified questionnaire used in a similar research among adolescents in the Canton of Sarajevo. The data were statistically analyzed using SPSS 22.0. The results by the place of residence show that milk consumption is more present in urban rather than in rural areas. The quantities of milk/yogurt/cheese and the living area are statistically independent. When considering the gender and the place of residence, the test has showed that there is a difference in the distribution of daily quantity of consumed milk between urban and rural areas, within adolescent girls. Taking into account only the gender, adolescent boys more frequently consume milk and dairy products than adolescent girls.

Keywords: adolescents, gender, place of residence, consumption of milk/dairy products, growth and development

Introduction

There is an accelerated growth in adolescence, the increase of muscle mass, the maturation and increased physical activity. Physical activity doesn't have to be increased but total energy needs are higher because of a bigger body size. With higher energy, there is needs also needs in protein, vitamins and minerals increase. During adolescence, 50.0% of weight and 20.0% of height is gained (Spear, 2002). Monitoring of nutrition and the nutritional category of children and adolescents is a good indicator of the nutritional state of the community (Eveleth & Tanner, 1990). If adequate nutrition is not achieved in this period of life, there is the potential postponement of sexual maturation and lower linear growth (Story, 1992). Monitoring of growth and development enables the evaluation of body development individually and it also serves for tracking trends according to the effect of ecological factors during the specified time period (Eveleth & Tanner, 1990; Antonić-Degač, 1999). Regarding the world level, there are big differences in height, weight and age of puberty among individual populations. The genetical growth factor is similar for the most people and the existing differences are more the result of the effect of ecological factors (Eveleth & Tanner, 1990). The research shows hat differences in height and weight of children with different ethnic origin are relatively small according to the differences among children of different social class (Buzina, 1977; Matsumoto, 1982).In European countries, the highest boys and girls are in Netherlands and Sweden. The height increase follows the increase of body mass (Eveleth & Tanner, 1990; Prebeg, 1994).

Hormonal changes in adolescence have an effect on characteristical changes in body size, body composition (muscles, bones, fat), skeleton and sexual maturation. Those changes are basis of increased needs for nutrients at that age. Unlike children's adolescents' nutrient needs are different according to gender and it continues in the adult age (Stanga et al., 2005).

Adolescents have special nutritive demands because of the rapid growth and maturation linked to the onset of puberty. The research related to the nutrition shows that adolescents do not take

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adequate amount of folats, calcium, iron, zinc, magnesium, vitamins A, E, B1, B2, B6 (Skiba et al., 1997; Stallings, 2006). Dietary fiber intake is also very low.

Cca. 99.0% of calcium in the body is in the bones and teeth. The adequate calcium intake during childhood and adolescence is important for proper mineralization of bones, gaining the bone mass and reducing the risk of one fracture and osteoporosis in adulthood (Food and Nutrition Board, IOM, 2011). Certain vegetables and cereals are also rich in calcium but their availability is lower than in dairy products. In the case of not being able to reach the recommended intake of calcium, it is necessary to use supplements alog with the proper nutrition, also the intake of other nutrients can be achieved in that way (Kaplan Seidenfeld et al., 2004).

One of the most significant predictors of food behaviour in adolescence is the place of residence, i.e. wheter the adolescents live in the urban or in the rural area (Hodgkin et al., 2010; Wang et al., 2002). Urbanization is an inevitable outcome of the economic behaviour and it refers to the transition from the rural society to another one which most of the population lives in the cities. The pozitive relation between the economic prosperity and urbanization is strong and often demonstrated. Eating patterns are often dependent on the urbanization status and linked to the urban-rural differences in health and nutritional status (Holmboe-Ottesen, G., 2000; Popkin et al., 1993; Popkin, 2001; Yamauchi et al., 2001). However, this trend is not uniform. There are reports about the higher intake of energy, fat and micronutrients among the rural population (Mennen et al., 2000; Mazengo et al., 1997), the typical trend of the increased lipid and calorie intake and the reduction of micronutrient intake which comes with urbanization (Qu et al., 1997; Nakatsuka et al., 1999; Qu et al.,2000; He et al.,1996). The rural-urban differences in the micronutrient intake can vary in different parts of the world. Those differences are understandable if urbanization is regarded as a linear phenomenon. The administrative demarcation does not separate population in two homogenous groups and in each official category there are differences in wealth and/or style of life which can make certain groups more urban than the others. In addition, the wealth and cultural background can also intervene to check or promote the adoption of certain components of the urbanized life. Food intake can vary between different urban and rural groups and tendency to the undernutrition does not have to be linked to the urbanization. It is important to identify the specific food inadequacy in any group and to understand differences in different urban and rural groups (Hakeem et al., 2002).

To sum up the aim of the study was to explore if gender and place of residence have an effect on the habit of consuming milk and dairy products among adolescents.

Subjects and methods

The study included 630 participants, 133 adolescents from the rural area (60 boys and 73 girls) and 497 adolescents from the urban area (264 boys and 233 girls) of the Canton of Sarajevo. Participants were 13-15 years old. The distribution of participants is presented in accordance to the demographic data of the Federal Bureau of Statistics of the Canton of Sarajevo (Federalni zavod za statistiku, www.fzs.ba (2013). The research was conducted in twelve primary schools located in nine municipalities of the Canton of Sarajevo during five months (February till June) and the Protocol was approved by the Ministry of Education, Sciences and Youth of the Canton of Sarajevo. Adolescents were introduced to the research protocol and they participated voluntarily. Taking into account that the Urbanistic Studies of the Sarajevo Canton are still undergoing it's development process in the division of the Canton of Sarajevo by the type of settlement (urban and rural area) was done according to the Spatial Plan of the Canton of Sarajevo for the period 2003- 2023 (Zavod za planiranje razvoja Kantona Sarajevo 2006).

The questionnaire used for investigating milk and dairy consumption is classified as a semi-quantitative, which involves the amount and the frequency of consumed foods, and it also represents a modified questionnaire used in a similar research among adolescents in the Canton of Sarajevo previously done by the first author (Taljić, 2015; Hodžić & Smajić, 2012).

Results and discussion

The sample is approximately equally distributed by the gender and the living area.

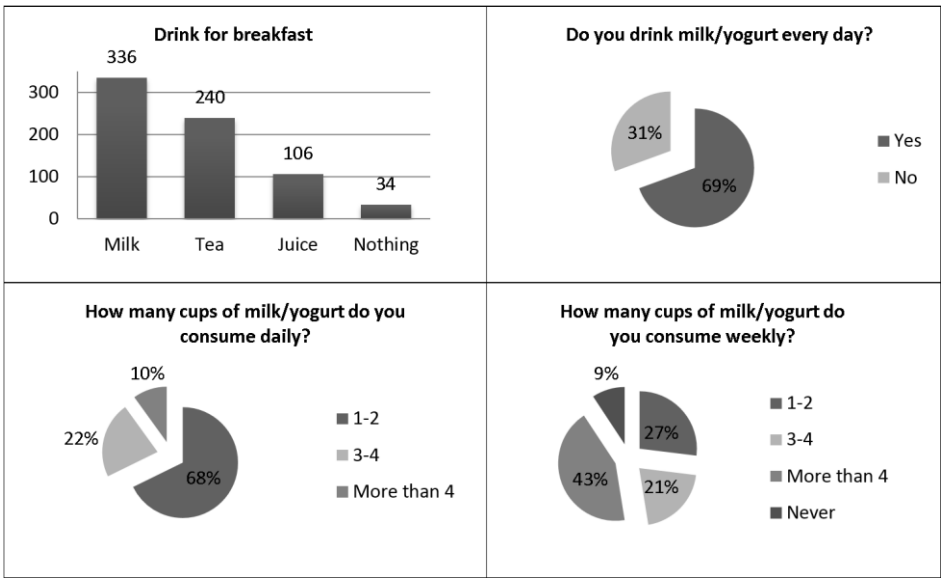

Fig. 1. The structure of the sample according to the habit of consuming milk or yogurt

According to the results shown in Fig. 1, 336 (53%) of adolescents choose milk as a drink for breakfast, while 69% of them consume milk every day. Breakfast consumption is very important and skipping it may cause concentration failure and obesity. Many studies have found higher milk consumption among adolescents who eat breakfast (Bowman, 2002; Ortega et al., 1998). Considering the amount, most of the adolescents (68%) consume 1-2 cups of milk/yogurt every day, while, on a weekly basis most of them (43%) consume more than 4 cups.

Aiming to explore if gender and place of residence have an effect on the habit of consuming milk and dairy products, the differences in patterns and amounts between adolescent boys and girls and between rural and urban areas were tested.

Considering that all of the variables are categorical, chi-square tests of independence or association in the joint responses for two categorical variables were performed (Resić et al., 2010).

Table 1. Consuming milk and dairy products according to the gender

		Boys (%)	Girls (%)	χ^2	*p*-value
Milk for breakfast	Yes	58.3	48.0	6.700	0.010
	No	41.7	52.0		
Milk/yogurt, every day	Yes	74.0	64.6	6.535	0.011
	No	26.0	35.4		
Cups of milk/yogurt, daily	1-2	62.2	74.6	9.887	0.007
	3-4	24.4	19.7		
	More than 4	13.4	5.7		
Cups of milk/yogurt, weekly	1-2	23.2	31.1	10.983	0.012
	3-4	18.8	22.3		
	More than 4	50.0	35.9		
	Never	8.0	10.7		
Cheese, weekly	1-2 times	49.1	55.1	6.547	0.088
	3-4 times	23.5	22.8		
	More than 4 times	15.7	9.2		
	Never	11.7	12.9		

According to the results of the chi-square test (Table 1), there are different patterns in choosing milk for breakfast (p=0.010) and consuming milk or yogurt every day (p=0.011) between adolescent boys and girls. The amounts that adolescent boys and girls consume on a daily (p=0.007) or a weekly basis (p=0.012) are also different. Generally, the adolescent boys more frequently consume milk and dairy products than the adolescent girls. The difference in a weekly habit of consuming cheese, between adolescent boys and girls, is not confirmed (p=0.088).

Table 2. Consuming milk and dairy products according to the place of residence

		Rural (%)	Urban (%)	χ2	*p*-value
Milk for breakfast	Yes	49.2	57.1	3.975	0.046
	No	50.8	42.9		
Milk/yogurt, every day	Yes	61.3	76.7	17.622	0.000
	No	38.7	23.3		
Cups of milk/yogurt, daily	1-2	68.7	67.1	4.061	0.131
	3-4	24.6	20.6		
	More than 4	6.7	12.3		
Cups of milk/yogurt, weekly	1-2	27.2	26.7	2.725	0.436
	3-4	23.0	18.0		
	More than 4	41.8	44.8		
	Never	8.0	10.5		
Cheese, weekly	1-2 times	53.9	50.3	5.228	0.156
	3-4 times	20.5	25.5		
	More than 4 times	11.1	13.9		
	Never	14.5	10.3		

The independency between the consumption of milk or yogurt and the living area was also tested. he results indicate that there are statistically significant differences between the urban and the rural areas in choosing milk for breakfast and the consumption of milk or yogurt every day (p=0.000). In both cases, milk consumption is more present in the urban rather than in the rural areas. The quantities of milk/yogurt/cheese and the living area are statistically independent (Table 2).

Table 3. Consumption of milk and dairy products according to the place of residence (Boys)

		Rural (%)	Urban (%)	χ2	p-value
Milk for breakfast	Yes	53.2	63.1	3.225	0.071
	No	46.8	36.9		
Milk/yogurt, every day	Yes	65.8	81.5	10.381	**0.001**
	No	34.2	18.5		
Cups of milk/yogurt, daily	1-2	63.6	65.2	4.762	0.092
	3-4	27.1	18.7		
	More than 4	9.3	16.1		
Cups of milk/yogurt, weekly	1-2	21.9	24.5	3.103	0.376
	3-4	21.9	15.8		
	More than 4	50.4	49.6		
	Never	5.8	10.1		
Cheese, weekly	1-2 times	55.8	42.9	6.831	0.077
	3-4 times	18.6	28.0		
	More than 4 times	13.4	17.8		
	Never	12.2	11.3		

The independency of the amount of consumed dairy products and the place of residence lead to the idea of testing the relation between the place of residence and habits of dairy product consumption within groups of boys and girls, separately (Tables 3 and 4). The test has shown that there is a difference in the habit of consuming milk/yogurt every day among boys living in a different place of residence (Table 3). The test has also shown that there is a difference in the habit of consuming milk/yogurt and in the distribution of a daily quantity of the consumed milk between urban and rural areas, in regard to the adolescent girls (Table 4). In the study made by Colić-Barić et al. (2001), the girls from the rural area consumed milk less on daily basis than the urban adolescents and the rural boys.

Table 4. Consumption of milk and dairy products according to the place of residence (Girls)

		Rural (%)	Urban (%)	χ^2	p-value
Milk for breakfast	Yes	44.8	50.9	1.160	0.281
	No	55.2	49.1		
Milk/yogurt, every day	Yes	56.3	71.8	7.911	**0.005**
	No	43.7	28.2		
Cups of milk/yogurt, daily	1-2	87.1	71.8	9.612	**0.008**
	3-4	11.9	20.6		
	More than 4	1.0	7.6		
Cups of milk/yogurt, weekly	1-2	33.1	29.1	1.603	0.659
	3-4	24.2	20.5		
	More than 4	32.2	39.4		
	Never	10.5	11.0		
Cheese, weekly	1-2 times	51.8	58.0	4.216	0.239
	3-4 times	22.7	22.8		
	More than 4 times	8.5	9.9		
	Never	17.0	9.3		

Conclusions

The results show that half of the participants have a habit of consuming milk and choose it as a breakfast drink. On a daily basis, milk/yogurt is consumed in 1-2 cups and on a weekly more than 4 cups. Generally, adolescent boys more frequently consume milk and dairy products than adolescent girls. Statistically significant differences are shown between the urban and the rural areas in choosing milk for breakfast, especially if we take into account the urban area. When it comes to testing the relationship between the place of residence and the habits of dairy product consumption within groups of boys and girls separately, the test has shown that there is a difference in the habit of consuming milk/yogurt in both genders and in the distribution of a daily quantity of the consumed milkbetween the urban and the rural adolescent girls.

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