

RESEARCH ARTICLE

Food Consumption Frequency at Students from Rural Areas from Moldova Republic

Zepca Victor¹, Tarcea Monica^{2*}, Zaporozjan Aculina¹¹ Department of Hygiene, National Center for Public Health, Chisinau, Republic of Moldova² Department of Community Nutrition and Food safety, University of Medicine and Pharmacy Tirgu Mures, Romania

Objective: Our study aim to evaluate the characteristics of nutrition behavior at teenagers from Moldova's rural area schools in order to make a profile of risk behavior related to diet and to implement efficient community intervention programs. **Methods:** We studied in 2014 the daily frequency consumption of the main food groups, in a sample of 1236 students of 7th-12th class, from rural localities of the Republic of Moldova, using the questionnaire method. **Results:** The teenagers had consumed on the day preceding the interview, cereals and bakery products – 99.2%, fruits – 86.7%, cooked vegetables – 72.6%, meat dishes – 72.1%, potatoes – 50.3%, dairy products – 46.9%, raw vegetables – 44.7%, eggs – 25.3%, fish – 19.4%, raw fruits juice – 14.8%, legumes – 12.5% of students. From those investigated 52.6% have consumed food with high fat content higher than recommended levels. Regarding the food groups present in the menu we registered a satisfactory level of consumption by the students for cereals and bakery products, fruits, cooked vegetables and meat dishes; relatively satisfactory - the consumption of dairy products, raw vegetables and potatoes; unsatisfactory level for the consumption of eggs, fish and legumes. **Conclusions:** We sustain the idea that it is important to constantly evaluate the risk factors related to the inadequate diet at teenagers and to implement efficient community intervention in order to prevent nutrition related diseases that can occur.

Keywords: students, foodstuff, diet, intervention

Received: 14 February 2015 / Accepted: 4 June 2015

Introduction

Food quality for our body is dependent on the diversification of foodstuffs included in the individual's daily ration, especially children. The failure of this principle can cause various pathologies. Children's current nutritional habits can have prejudicially effects on their health. The most common diet mistakes observed in this group of ages refers to excessive consumption of carbonated drinks and fast food, which is in disadvantage of vegetables and fruits, high fiber nutritional products, dairy or other calcium rich products [1,2].

An important volume of vegetables in the menu helps to obtain saturation, and their low-value energy, make it useful in the prevention and treatment of obesity. Fruits and vegetables additionally contain dietary fiber and are rich in ascorbic acid and other vitamins. Physiological daily ration of fruits and vegetables for children is 950-1100 g/ day and for adolescents 1000-1300 g/day [3].

Nutrition behavior of adolescents is marked by excessive consumption of meat and low consumption of fish, also milk consumption decreases with age. For many teenagers milk is considered baby food and a source of fattening, so it is used only for breakfast and that only by some of them. Bread and potatoes consumption increases during adolescence. However, cereals, bread and dried vegetables are insufficient [4].

Social factors affects in special particular food share, especially during adolescence, when the change of nutritional habits may be associated with the freedom of expression, getting out of parents control, formation own personalities, exert the negative influences from colleagues. This excess of independence can be manifested by a high consumption of foods like "fast food", refreshments, rejection of breakfast or fruits and vegetables [5-7].

Our study aim to evaluate the characteristics of nutrition behavior at teenagers from Moldova's rural area schools in order to make a profile of risk behavior related to diet and to implement efficient community intervention programs.

Methods

This is an descriptive cross-sectional study, conducted on a group of 12,363 students, 13-19 years old, classes VII-XII from 10 schools of the Republic of Moldova, from rural areas, including three national geographic regions: central, northern and southern regions. It was conducted during the period of September-October 2014. As data collection instruments we used as the questionnaire from Health Behavior in School aged Children (HBSC), a WHO study done in 2009-2010 in EU countries, completed by a validated questionnaire made from a number of items about eating habits made by the authors. All the students involved signed an informed consent about our study.

The study included 545 boys (44.1%) and 691 girls (55.9%).

* Correspondence to: Monica Tarcea
E-mail: monica.tarcea@umftgm.ro

Results

A day preceding the questioning, 13.3% of students (50.9% boys and 49.1% girls) didn't consume raw fruits. Once a day eat raw fruits 41.8% students (39.6% boys and 60.4% girls, $p < 0.001$). The share of students who consumed fruits once a day is 28.0% from 7th class with a insignificantly increase to 46.8% in 12th class. Eat two or more times a day raw fruits 44.9% students (boys - 46.4%, girls - 53.6%) in 7th class 50% and in 12th - 37.85%.

In our sample, from 76.9% to 89.55% students from 7th – 12th grade, consumed raw fruits at least once a day (Figure 1). By gender, from 12.1 to 19.6% boys and 8.8 to 13.2% girls from in 7th – 12th classes from rural areas, didn't eat raw fruits on the day preceding the questioning.

Those who didn't consume raw fruit juice have a frequency of 85.2% (43.5% boys and 56.5% girls, $p < 0.001$) from all surveyed students - 6.4 times more than students that didn't consume raw fruits (13.3%). Have consumed once a day fruit juice - 10.6% students, and two or more times a day - 4.2%, meaning a very low percentage for the autumn season. The highest frequency of students who didn't consume raw fruit juice were in 10th class - 89.3% and the lowest in 7th class - 78.4% ($p < 0.01$). Also didn't consume raw fruit juice 78.1% - 90.5% boys and 78.1% - 88.6% 78.1% girls from 7th – 12th classes.

More than half of them, 55.3% of surveyed students, didn't consume raw vegetables (45.1% boys and 54.9% girls, $p < 0.05$). From 48.9 to 66.2% boys didn't eat raw vegetables the day preceding the questioning and from 47.8 to 59.8% girls also, from 7th – 12th classes in the surveyed areas. In the day preceding the questioning, 29.8% of students (42.1% boys and 57.9% girls, $p < 0.01$) consumed only once per day raw vegetables. Only 14.9% students (44.3% boys and 55.7% girls) consumed raw vegetables the day before interviewing two or more times (Figure 2).

Regarding the consuming of prepared vegetables, 48.8% of students (40.4% boys and 59.6% girls, $p < 0.001$) ate once in a day. Twice or more times per day ate prepared vegetables only 23.8% of students (47.9% boys and 52.1%

girls). Students from 9th grade that eat once a day prepared vegetables were 41.8%, and those from 12th class - 56.9% ($p < 0.05$). In the 8th class 43.5% of students consumed twice per day or more prepared vegetables compared with 20.0% students from 12th class ($p < 0.01$). Didn't eat prepared vegetables 27.4% students (47.2% boys and 52.8% girls). Limits of those who did not eat prepared vegetables are between 23.1% - 31.3% students from 7th – 12th. Didn't eat prepared vegetables 19.7% - 34.9% of boys and 22.4% - 27.9% girls from 7th – 12th classes from rural areas. Consumption of prepared vegetable was with 1.6 times higher than consumption of raw vegetables.

Didn't eat potatoes the day preceding the questioning 49.7% of students (38.8% boys and 61.2% girls, $p < 0.001$), meaning 39.4% - 50.5% boys and respectively 42.3% - 59.3% girls from 7th – 12th classes from rural areas.

Ate potatoes just once the day before interviewing 42.1% of students (47.1% boys and 52.9% girls). Students who eat potatoes twice or more times per day have a share of 8.2% (60.4% boys and 39.6% girls, $p < 0.01$).

Didn't eat meat products on the previous day of interviewing 27.9% of students (39.7% boys and 60.3% girls, $p < 0.001$) between 17.6% - 33.1% boys and 23.4% - 37.2% girls from 7th – 12th classes from rural areas. Ate meat dishes a day preceding the questioning from 67.0 to 82.4% boys and 66.0 - 76.6% girls from 7th – 12th classes from rural areas. Ate meat and meat products just once 51.9% of students (42.1% boys and 57.9% girls, $p < 0.001$). The day preceding the questioning, consumed meat products twice or more times 20.2% of students (55.4% boys and 44.6% girls).

In our group, did not eat fish dishes 80.6% of students (44.1% boys and 55.9% girls, $p < 0.001$). Did ate fish dishes once a day 16.3% of students (40.8% boys and 59.2% girls, $p < 0.01$) and also 3.1% of students (64.9% boys and 35.1% girls) ate fish dishes twice or more times.

99.2% of students ate bread and cereals on the day preceding the questioning.

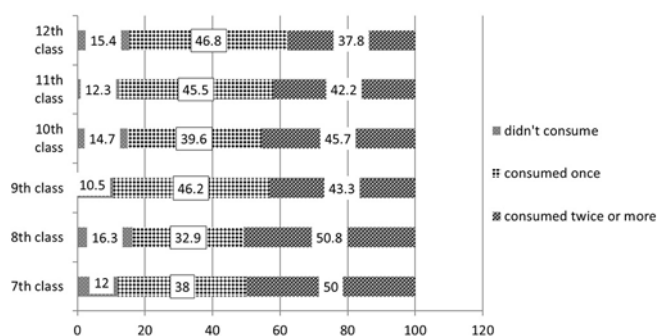


Fig. 1. Levels of consumption of raw fruits at students from 7th – 12th grades, from Moldova rural areas (%), on the day preceding the questioning

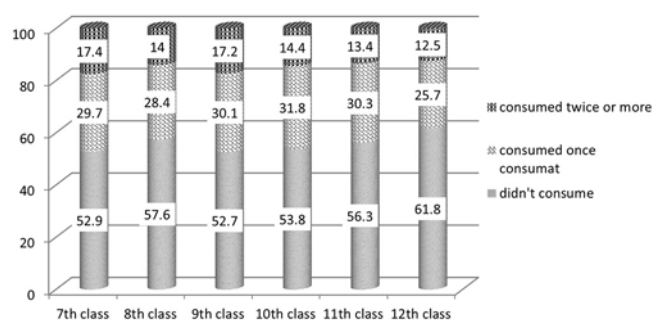


Fig. 2. Level of consumption of raw vegetables on the day preceding the questioning at students from 7th – 12th classes in Moldova rural areas (%)

86.1% students ate bread, 6.6%, - cereal porridges, macaroni - 13.1%, rolls - 19.9%, polenta - 4.6%, pies - 27.6% and other bakery products - 3.9%.

13.4% of students (48.5% boys and 51.5% girls) ate dairy products twice or more a day before interviewing. So those who consumed dairy products are a percentage of 53.2%, a half of all surveyed students. Ate dairy products on the day preceding the questioning from 43.3 to 62.5% boys and from 41.1 to 58.5% girls from 7th – 12th classes from rural areas. In the 7th class consumed dairy products 57.7% of students, and in 12th class - 44.8% of students, with an insignificant difference (Figure 3). Didn't consume dairy products 46.8% of students (41.4% boys and 58.6% girls, $p < 0.001$).

Bean dishes like beans, chickpeas, peas and soybeans usually is consumed about 12.5% of students. 10.7% of students (49.6% boys and 50.4% girls) ate bean dishes once a day and twice or more per day - 1.8% students (36.4% boys and 63, 6% girls). Didn't eat beans on the day preceding the questioning 87.5% of students (43.5% boys and 56.5% girls, $p < 0.001$).

Ate eggs the day before questionnaires 25.3% of students. Once consumed eggs 23.2% of students (45.9% boys and 54.1% girls) and twice or more times - 2.1% of students (73.1% boys and 26.9% girls, $p < 0.05$). Ate eggs on the day preceding the questioning from 25.0 to 36.6% boys and from 17.7 to 30.1% girls from 7th – 12th classes from rural areas. A share of 74.7% did not consume eggs (42.5% boys and 57.5% girls, $p < 0.001$).

Fatty food like butter, margarine, lard or pork was consumed by 52.6% of students, on the day preceding the questioning. 46.3% students (48.9% boys and 51.1% girls) ate once a day fatty food, and twice or more times was eaten by 6.3% of students (49.4% boys and 50,6% girls). Didn't ate fatty food 47.4% of students (38.8% boys and 61.2% girls, $p < 0.001$). Did not eat fatty products from 46.9 to 55.7% boys and from 28.8 to 45.6% girls from 7th – 12th classes from rural areas.

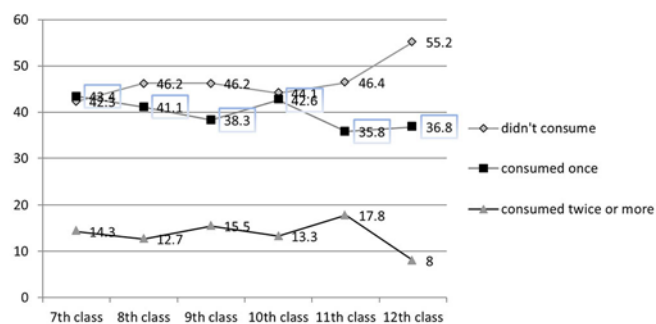


Fig. 3. Levels of dairy consumption among students from 7th – 12th classes from rural areas from the Republic of Moldova (%)

Discussion

A report of UNICEF 2009-2010 which studied the health of children from 11 to 15 years old, from 29 countries, showed that highest daily consumption of fruits is in Denmark (almost 50%), Romania is situated in top half (41%) and Finland is on last place from the surveyed countries (24%) [8]. Also it shows that daily consumption of fruits decreases significantly with age, for both boys and girls, and boys consume significantly less fruits than girls. Among girls and boys 11-15 years old, 60.0% didn't have an adequately consumption of fruit. Consumption of vegetables is significantly lower than that of fruit for all ages and both gender [9]. If we compare the data from the previous study and ours, we obtained that in Moldova the frequency of students who did not eat fruits is 13.3% with no significant difference by age groups. Significantly consume more fruits girls than boys in Moldova.

In Romania consume raw vegetables at least once a day 34.3% of students, while in Moldova - 44.7%; milk - 15.2% of students and in Moldova - 53.2% [8].

Increasing of fruit and vegetable consumption among children and adolescents is a factor that optimizes health and reduces risk of cardiovascular disease and some forms of cancers. In this regard, the World Health Organization recommended 5 portions of fruit and vegetables daily [10].

Conclusion

From the main food groups, our rural areas students are usually consuming on the satisfying level the consumption: cereals and bakery products, fruits, prepared vegetables and meat dishes; relatively satisfying levels were registered for the consumption of dairy products, raw vegetables and potatoes and on unsatisfactory level was the consumption of eggs, fish and vegetables.

The highest deficiencies in food consumption at teenagers was found among girls, the vulnerable group at this age.

We sustain that it is very important to constantly evaluate the risk factors related to the inadequate diet at teenagers and to implement efficient community interventions in this communities in order to prevent nutrition related diseases that can occur.

Conflict of interests

The authors declare no conflict of interest.

References

- Prejbeanu I, Cara M, Pisoschi C. Socio-economic factors influencing the nutritional behaviour of students. *Current Health Sciences Journal*, 2012;38:14-18.
- Elliott C. Food as people: Teenagers' perspectives on food personalities and implications for healthy eating. *Soc Sci Med*, 2014;121:85-90.
- Petrescu C. *Igiena mediului, alimentației și a dezvoltării copilului și adolescentului*. Edit. Eurobit, Timișoara, 2008; 2010-2014.
- Gavăt V, Albu A, Petrariu FD. *Alimentația și mediul de viață în relație cu dezvoltarea copiilor și a tinerilor*. Edit. "Gr. T. Popa", 2006;110-117.
- Ilieș AI, Domnariu HP, Domnariu CD. Evaluarea comportamentului alimentar la un lot de copii și adolescenți din Județul Sibiu – consumul de fructe și legume. *AMT*, 2012;4:1-3.
- Braithwaite I, Stewart AW, Hancox RJ, et al. Fast-food consumption

- and body mass index in children and adolescents: an international cross-sectional study. *BMJ Open*, 2014;4:e005813.
7. Bellisle F, Hébel P, Colin J, Reyé B, Hopkins S. Consumption of whole grains in French children, adolescents and adults. *Br J Nutr*, 2014;112:1674-84.
 8. UNICEF Report: Child well-being in rich countries, http://www.wikiprogress.org/index.php/UNICEF_Report_Card_11:_Child_wellbeing_in_rich_countries.
 9. Raportul Asociației Române de Psihologia Sănătății - Comportamente de sănătate la copiii și adolescenții din România: comportament alimentar și activitate fizică. Cluj-Napoca 2010; <http://www.aspgorj.ro/promovare/raport%20HBSC%20dec2010.pd>
 10. WHO/HBSC Forum 2009. Socio-environmentally determined health inequities among children and adolescents. Summary of outcomes, background papers and country case studies; at <http://www.euro.who.int>.