

ORIGINAL ARTICLE

Can a place of living of elementary school students determine their health habit?

Larisa Gavran¹, Vedada Čerim¹, Nino Hasanica^{2,3}

¹Educational Teaching Centre of Family Medicine, Primary Health Care Zenica, ²Department for School Hygiene, Institute for Health and Food Safety Zenica, ³School of Medicine, University of Zenica; Zenica, Bosnia and Herzegovina

ABSTRACT

Aim To determine dietary habits of elementary school students in relation to a place of living and socio-economic status of the family.

Methods A prospective study conducted in the Primary Health Center Zenica involved five family medicine teams in urban and five in rural settlement during 2015. Elementary school students aged 10-16 were interviewed by random selection using a questionnaire on the socio-economic status of parents and nutritional habits of adolescents.

Results The survey involved 199 respondents, 103 from rural and 96 from urban area. There were significantly more pupils from employed parents who consumed non-carbonated drinks. Students from urban areas more likely consumed fruit every day than children from rural areas. More than half of the respondents did not or rarely consumed vegetables, in this case the village pupils, who consumed much less milk. It would be expected that rural students were more likely to consume fruits, vegetables and milk due to easier access to these foods in the countryside, but the results of this research did not confirm this assumption.

Conclusion Changes in traditional family functioning (lower income, unemployment) could be linked with lifestyle changes (low consumption of fruits and vegetables, low consumption of milk both in rural and urban areas, consumption of carbonated drinks), especially in families in rural areas.

Key words: adolescents, dietary habits, milk, socio economic status, vegetables

Corresponding author:

Nino Hasanica

Institute for Health and Food Safety

Fra Ivana Jukića 2, 72000 Zenica,

Bosnia and Herzegovina

Phone: +387 32 448 027;

Fax: +387 32 448 000;

E-mail: nino_hasanica@hotmail.com

Larisa Gavran ORCID ID: <https://orcid.org/>

0000-0001-6035-6496

Original submission:

29 May 2018;

Revised submission:

11 July 2018;

Accepted:

26 September 2018.

doi: 10.17392/968-19

Med Glas (Zenica) 2019; 16(1):137-143

INTRODUCTION

Elementary school students (10-16 years of age) often experience eating disorders or an irregular attitude towards food – too little vegetables, fruits and dairy products, too much fast food and snacks and meals at irregular intervals (1). Students of this age group more often consume food outside the house due to lack of time, the dynamics of life and the absence of parents for work (2). Meals that are energy-rich in composition but poor in protective substances, are consumed more and more frequently, so one quarter to one third of energy is generated by feeding snacks (2). An adequate intake of energy and nutrients during childhood and adolescence will not only reduce the risk of developing current health problems (caries, anaemia, growth disorders, obesity), but it will also delay or prevent the onset of chronic illnesses in adulthood (cardiovascular diseases, hypertension, stroke, some forms of malignant diseases, diabetes, osteoporosis) (3).

The most traditional approach about inequities in health is in relation to the individual economic situation (4). In young people (11 to 15 years of age) the role of socioeconomic factors in health is not so clear; some studies have demonstrated the link between a socio-economic status and health outcomes and behaviour (4), some of them showed the protective role of lower socioeconomic status in relation to higher ones (5), while in a series of studies the correlation between socioeconomic status and youth health has not been established (6).

A study conducted in England showed that young people, 11-15 years of age, with a weak feeling of emotional connection with the family and low involvement in the neighbourhood were almost twice as likely to report poor health and low consumption of fruit and vegetables (5). Children from a single-parent family are not only with increased possibility for risky behaviour but also it is more likely their families are poorer, which can additionally affect health and a good subjective feeling in life (5). However, circumstances such as unemployment, time-limiting situations with children (night work, additional jobs to improve income) make even intact families vulnerable and risky for child development (4). In Moldova, only six of 10 respondents indicated that they ate breakfast every weekday and every 10th skipped breakfast (6). In Croatia, most elemen-

tary school students (11-15 years of age) do not eat breakfast, fruits and vegetables according to the guidelines for proper nutrition (4).

Looking at the social environment, young people (11-15 years of age) have better relationships with the closest persons and a good level of communication with their parents (7). Young people are the most suitable population group for the adoption of bad eating habits because, due to the lack of time and employment of parents, they increasingly consume food outside the family home, most often as a “fast food” meal (8-10).

Reports about eating habits in Bosnia and Herzegovina (B&H) are scarce. In a survey conducted in Travnik (B&H), young people (11-14 years of age) in a rural area consume fruit every day more frequently than those in the city (11).

The aim of this research was to determine nutritional habits of elementary school students 10-16 years of age (young people) in relation to the place of living and socio-economic status of the family. This research will primarily serve for better planning of preventive and promotional public health activities as well as family medicine employees in their daily work.

EXAMINEES AND METHODS

Examinees and study design

This prospective study conducted in the Primary Health Centre of Zenica, Bosnia and Herzegovina, involved five family medicine teams in urban and five in rural settlements during 2015. Family medicine teams were randomly selected. The examinees involved in the study were primary school students aged 10-16 years old, who were checked in a family medicine clinic for any reason.

Consent for participation in the study was given by the Ethics Committee of the Primary Health Care of Zenica. Oral approvals were obtained from the students' parents, who attended the interview too.

Methods

The questionnaire was created for this research. The questions were clear, unambiguous and precisely formulated. In the first part of the questionnaire, a nurse in the family medicine clinic received answers from the students through an interview (gender, age, socio-economic status). The second part of the questionnaire was filled out

by students independently (knowledge, attitudes and behaviour). The questionnaire was supposed to determine socio-economic conditions in which the adolescents lived (place of residence, employment of parents, family status), which may contribute to knowledge, attitudes and dietary habits of adolescents (non-carbonated and carbonated drinks, fruit, vegetables, milk, breakfast).

Statistical analysis

For the analysis of the results, methods of descriptive statistics, χ^2 test and Student t-test were used. Statistical significance was set up for $p < 0.05$.

RESULTS

The survey involved 199 students, 103 (51.8%) from rural and 96 (48.2%) from urban area. The number of female students, who visited the physician in the rural area, was much higher, 66 (62.3%) ($p < 0.05$). Average age of the students in rural and urban area was 13.6 and 13.7 years of age, respectively.

No statistically significant difference was found in the number of students living with both parents, with one parent, or with a guardian (without biological parents). A total of 92 (89.3%) students in the rural area and 88 (91.6%) in the urban area lived with both parents, nine (8.7%) students in the rural area and eight (8.3%) in the urban area lived with one parent, and two (1.9%) students in the rural area with guardians (without biological parents) ($p > 0.05$).

The parents of 59 (57.3%) students in the rural area and 84 (87.5%) in the urban area were employed, 35 (33.98%) in the rural area and 12

(12.5%) in the urban area were unemployed, four (3.8%) in the rural area were pensioners, and five (4.85%) students in the rural area had parents who were also students themselves ($p < 0.05$).

Of the total of 199 students, 168 (84.4%) regularly eat breakfast in the morning: 81 (48.2%) in rural and 87 (51.7%) in urban area ($p > 0.05$) (Table 1).

Table 1. Consumption of breakfast during a week in relation to the place of living

Place of living	No (%) of students per number of days during a week							
	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Rural	3 (75)	2 (66.6)	3 (100)	3 (75)	6 (66.6)	4 (57.1)	1 (100)	81 (48.2)
Urban	1 (25)	1 (33.3)	0	1 (25)	3 (33.3)	3 (42.8)	0	87 (51.7)
Total	4 (100)	3 (100)	3 (100)	4 (100)	9 (100)	7 (100)	1 (100)	168 (100)

A total of 124 (73.8%) students whose parents are employed have breakfast every day, as opposed to 38 (22.6%) students whose parents were unemployed ($p < 0.05$). Occasional breakfast consumption during a week was similar in both groups (Table 2).

Table 2. Consumption of breakfast during a week in relation to the working status of parents

Working status of parents	No (%) of students per number of days during a week							
	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Employed	1 (25)	2 (66.6)	1 (33.3)	3 (75)	6 (66.6)	6 (85.7)	0	124 (73.8)
Unemployed	2 (50)	1 (33.3)	1 (33.3)	1 (25)	3 (33.3)	1 (14.2)	0	38 (22.6)
Pensioner	0	0	0	0	0	0	1 (100)	3 (1.7)
Student	1 (25)	0	1 (33.3)	0	0	0	0	3 (1.7)
Total	4 (100)	3 (100)	3 (100)	4 (100)	9 (100)	7 (100)	1 (100)	168 (100)

Table 3. Student food habits in relation to the place of living

Food	Place of living	No (%) of adolescents per number of week/day consumptions						
		Not in the last 7 days	1-3 times in the last 7 days	4-6 times in the last 7 days	Once daily	Twice daily	Three times a day	4 and more times a day
Fruit	Rural	3 (100)	17 (56.6)	13 (59.1)	25 (34.2)	25 (55.5)	10 (76.9)	10 (76.9)
	Urban	0	13 (43.3)	9 (40.9)	48 (65.8)	20 (44.4)	3 (23.1)	3 (23.1)
	Total	3 (100)	30 (100)	22 (100)	73 (100)	45 (100)	13 (100)	13 (100)
Vegetables	Rural	6 (31.6)	30 (60)	22 (59.5)	27 (39.1)	14 (82.4)	2 (50)	2 (66.6)
	Urban	13 (68.4)	20 (40)	15 (40.5)	42 (60.9)	3 (17.6)	2 (50)	1 (33.3)
	Total	19 (100)	50 (100)	37 (100)	69 (100)	17 (100)	4 (100)	3 (100)
Non-carbonated drinks	Rural	23 (47.9)	31 (59.6)	16 (55.2)	16 (41)	12 (66.6)	2 (20)	3 (100)
	Urban	25 (52.1)	21 (40.4)	13 (44.8)	23 (59)	6 (33.3)	8 (80)	0
	Total	48 (100)	52 (100)	29 (100)	39 (100)	18 (100)	10 (100)	3 (100)
Carbonated drinks	Rural	40 (44.5)	29 (54.7)	8 (61.5)	14 (58.3)	5 (50)	2 (100)	5 (71.4)
	Urban	50 (55.5)	24 (45.3)	5 (38.5)	10 (41.7)	5 (50)	0	2 (28.6)
	Total	90 (100)	53 (100)	13 (100)	24 (100)	10 (100)	2 (100)	7 (100)
Milk	Rural	22 (59.5)	37 (66)	26 (72.2)	13 (25)	3 (23)	1 (50)	1 (33.3)
	Urban	15 (40.5)	19 (34)	10 (27.8)	39 (75)	10 (77)	1 (50)	2 (66.6)
	Total	37 (100)	56 (100)	36 (100)	52 (100)	13 (100)	2 (100)	3 (100)

Table 4. Consumption of beverages in relation to family status

Beverages	Parental status	No (%) of students per number of week/day consumptions						
		Not in the last 7 days	1-3 times in the last 7 days	4-6 times in the last 7 days	Once daily	Twice daily	Three times a day	4 and more times a day
Non-carbonated drinks	Two parents	39 (81.3)	47 (90.4)	26 (89.7)	38 (97.4)	18 (100)	9 (90)	3 (100)
	One parent	8 (16.6)	5 (9.6)	3 (10.3)	1 (2.6)	0	0	0
	Guardian	1 (2.1)	0	0	0	0	1 (10)	0
	Total	48 (100)	52 (100)	29 (100)	39 (100)	18 (100)	10 (100)	3 (100)
Carbonated drinks	Two parents	78 (86.7)	50 (94.3)	13 (100)	22 (91.7)	10 (100)	1 (50)	6 (85.7)
	One parent	12 (13.3)	2 (3.8)	0	2 (8.3)	0	1 (50)	0
	Guardian	0	1 (1.9)	0	0	0	0	1 (14.3)
	Total	90 (100)	53 (100)	13 (100)	24 (100)	10 (100)	2 (100)	7 (100)
Milk	Two parents	35 (94.6)	49 (87.5)	31 (86.1)	48 (92.3)	13 (100)	1 (50)	3 (100)
	One parent	2 (5.4)	5 (8.9)	5 (13.9)	4 (7.7)	0	1 (50)	0
	Guardian	0	2 (3.6)	0	0	0	0	0
	Total	37 (100)	56 (100)	36 (100)	52 (100)	13 (100)	2 (100)	3 (100)

Of the total of 199 students, 72.4% consumed fruits daily one or more times: 74 (77.1%) in urban and 70 (68%) in rural areas ($p < 0.05$); 53.3% eat vegetables irregularly or never: 48 (50%) in urban and 58 (56.3%) in rural area; 93 (46.7%) consumed vegetables daily once or more times: 48 (50%) in urban and 45 (43.7%) in rural area ($p < 0.05$). A total of 48 (24.1%) students did not consume non-carbonated drinks: 25 (26%) in urban and 23 (22.3%) in rural areas ($p > 0.05$); 43 (21.6%) consumed carbonated beverages daily once or more times: 17 (17.7%) in urban and 26 (25.2%) in rural areas ($p > 0.05$); 129 (64.8%) did not eat milk regularly: 44 (45.8%) in urban and 85 (82.5%) in rural areas ($p < 0.05$) (Table 3).

It was found that there was no statistically significant difference in the consumption of non-carbonated drinks and in milk consumption relative to the family status (whether the adolescents live with two parents, one parent, or a guardian) ($p > 0.05$), but a statistically significant differ-

ence was found in the consumption of carbonated drinks ($p < 0.05$) (Table 4).

By analysing the consumption of non-carbonated drinks in relation to the working status of the parents, it was statistically significant that more frequently students consumed drinks regularly if their parents were employed, 60 (30.2%) ($p < 0.05$). By analysing the regular consumption of carbonated drinks, it was found that there was no statistically significant difference in relation to the working status of the parents: 30 (15.1%) adolescents with employed parents and 9 (4.5%) with unemployed parents ($p > 0.05$). By analysing milk consumption, there was a statistically significant difference in relation to the working status of parents: 58 (29.1%) students with employed and eight (4%) with unemployed parents consumed milk ($p < 0.05$) (Table 5).

DISCUSSION

This survey involved 199 respondents from the entire area of the City of Zenica (110,663 inhabi-

Table 5. Consumption of beverages in relation to employment of parents

Beverages	Working status of parents	No (%) of students per number of week/day consumptions						
		Not in the last 7 days	1-3 times in the last 7 days	4-6 times in the last 7 days	Once daily	Twice daily	Three times a day	4 and more times a day
Non-carbonated drinks	Employed	28 (58.3)	34 (65.4)	21 (72.4)	35 (89.7)	14 (77.8)	9 (90)	2 (66.6)
	Unemployed	17 (35.4)	15 (28.8)	8 (27.6)	3 (7.7)	4 (22.2)	0	0
	Pensioner	1 (2.1)	1 (1.9)	0	0	0	1 (10)	1 (33.3)
	Student	2 (4.2)	2 (3.8)	0	1 (2.6)	0	0	0
	Total	48 (100)	52 (100)	29 (100)	39 (100)	18 (100)	10 (100)	3 (100)
Carbonated drinks	Employed	69 (76.7)	37 (69.8)	7 (53.8)	16 (66.6)	8 (80)	1 (50)	5 (71.4)
	Unemployed	19 (21.1)	13 (24.5)	6 (46.2)	7 (29.2)	0	1 (50)	1 (14.3)
	Pensioner	1 (1.1)	1 (1.9)	0	0	1 (10)	0	1 (14.3)
	Student	1 (1.1)	2 (3.8)	0	1 (4.2)	1 (10)	0	0
	Total	90 (100)	53 (100)	13 (100)	24 (100)	10 (100)	2 (100)	7 (100)
Milk	Employed	26 (70.3)	31 (55.4)	28 (77.8)	45 (86.5)	9 (69.2)	1 (50)	3 (100)
	Unemployed	10 (27)	22 (39.3)	7 (19.4)	5 (9.6)	3 (23)	0	0
	Pensioner	0	2 (3.6)	1 (2.8)	1 (1.9)	0	0	0
	Student	1 (2.7)	1 (1.8)	0	1 (1.9)	1 (7.7)	1 (50)	0
	Total	37 (100)	56 (100)	36 (100)	52 (100)	13 (100)	2 (100)	3 (100)

tants). The highest percentage of students both in urban and in rural areas lived with both parents. Parents employment was more frequent in students from the urban area.

In this research it was found that 27.7% of adolescents consumed fruit rarely or never, without major differences between urban and rural areas. The survey conducted in Travnik (Bosnia and Herzegovina) in 2013 showed that many more students (11 to 14 years of age), who consumed fruits were from rural area (11). In a research conducted in 2015 in Croatia a total of 19.4% of students (11 to 15 years of age) declared that their family consumed fruits daily, and 17.9% rarely (12). It was a worrying fact that 13.4% of adolescents stated their family did not consume fruit because it was too expensive (12). In Croatia in 2014, at the age of 15, only a quarter of adolescents eat fruits daily (7), and in 2010, 66% of students did not eat fruit every day (4). A study conducted in Sicily (Italy) showed that higher parental education, occupation, and rural environment were positively associated with students' (12 to 14 years of age) daily consumption of fruits (13). In Poland, it was shown that between rural and urban students (15 to 17 years of age) no difference was observed in frequency of fresh fruit consumption (14). In Moldova, only one third of students (11 to 15 years of age) eat fruits daily and one fifth eat fruits once a week or less (6). High socio-economic status and urban residence was positively associated with intake of high-energy foods, such as foods of animal origin, Western style foods and dairy products (15).

In this study, 53.3% of the students eat vegetables irregularly or never. In Italy it was shown that occupation and rural environment were positively associated with the consumption of vegetables in adolescents (13). In Croatia in 2010, the data showed that three quarters of students (11 to 15 years of age) did not eat vegetables every day (4). In Poland, there were no differences in dietary behaviours concerning frequency of vegetable consumption between rural and urban areas (14).

In this study, 84.4% of students regularly ate breakfast in the morning, more in urban areas. In Croatia in 2014, at the age of 15, only 52% of males and 44% of females ate breakfast every day (7). It is worrying that from 2002 until 2010 a significant proportion of children did not even have breakfast at all (4). Over 90% of the 11-year-old students of both sexes in the Netherlands and Portugal regularly had breakfast on working days, while the same applies to only 50% of students from Slovenia and Romania at the age of 11 (4). In Moldova, girls skip breakfast during the week more often than boys, and this behaviour worsens with age: 17-year-old students have no breakfast 2.5 times more often than those 11-year-old (6). Eating breakfast is significantly more prevalent among boys and girls from more affluent families (15).

In this research it was established that 64.8% of respondents consumed milk irregularly or never; students from the rural areas consumed much less milk than those from the urban areas. It would be expected that adolescents in rural areas are more likely to consume milk due to better access to food in the countryside, but the results of this research do not confirm this (16,17). In Indonesia, rural students reported higher mean intakes of milk products than urban students (18). The proportions of children who consumed milk were higher in urban families in Canada (19).

In this study it was found that 24.1% of students did not consume non-carbonated drinks, and 40.7% did not consume them daily, with statistically significantly more students with employed parents, who consumed non-carbonated juices. In Croatia in 2014 at the age of 15, one quarter of adolescents consumed non-carbonated drinks daily (7). It was observed that students residing in rural areas had a higher prevalence of occasional consumption of natural fruit non-carbonated drinks (20).

In this study there was a statistically significant difference in the consumption of carbonated drinks relative to the family status. In other research the proportion of students exposed to daily consumption of carbonated drinks was higher among those who reported they lived in urban areas (65.0%) compared to those who reported living in rural areas (55.3%) (20). Health behaviours in almost all countries are associated with family affluence, but the patterns emerging for some behaviours vary by region. Higher rates of daily carbonated drink consumption are associated with lower family affluence among girls and boys in the majority of western and northern countries. By contrast, the consumption of carbonated drinks is associated with high family affluence in Eastern Europe and the Baltic states

(21). In Travnik in 2013, adolescents in urban areas consumed two times more often carbonated drinks than adolescents in rural areas (12). In Bangladesh, almost 80% of the tested examinees consumed carbonated drinks rarely or never (17). According to the results of the research conducted by the Institute for Development of Youth, KULT in 2016, there is no accurate data on the prevalence of obesity among the youth in Sarajevo Canton (Bosnia and Herzegovina). According to the CIA data from 2014, it is stated that B&H is rated the 47th for the occurrence of obesity in adults (a list of 190 countries) (22). The same source states that 19.2% of adults in B&H are obese (22). However, various organizations dealing with the measurements of these health indicators have made warning estimates for the onset of obesity in B&H in the future in all age groups, and suggest that this issue should be dealt with seriously (20).

In Croatia, students with poor economic status had 70% higher chance of low health self-esteem and life dissatisfaction at the age of 11, while at the age of 15 they had 80% higher chance of low self-esteem, and even 140% higher chance of life dissatisfaction (4). The ways in which an individual relates to social networks and communities has important effects on their health and well-being (5). In other studies, dietary patterns of children were associated with family socioeconomic status, practice of food restriction by parents/guardians and location of residence in urban or rural areas. Better socioeconomic conditions contributed to a more nutritionally inadequate dietary pattern (23). Identifying regional demographics may be useful in tailoring healthy eating programs to the speci-

fic school. Selected food behaviours (consumption of vegetables, fruits, carbonated drinks, milk, breakfast) of elementary school students from Ontario and Alberta improved with increasing school socioeconomic status and varied according to rural/urban school localisation (19). The proper lifestyle of a child, including proper eating habits, should be monitored to ensure proper physical and psychological development. This applies particularly to rural areas which are economically, socially and educationally underdeveloped (24). Those responsible for health-related planning could benefit from knowledge of how their state ranks in comparison to others regarding the consumption of fruits and vegetables by rural population, who are increasingly identified as those at risk for health disparities (25).

In conclusion, Bosnia and Herzegovina is a country in transition, and Zenica-Doboj Canton is one of the poorest in the country. Changes in traditional family functioning (lower income, unemployment) can be linked with changed lifestyles (low consumption of fruits and vegetables, low consumption of milk both in rural and urban areas, consumption of carbonated drinks), especially in families in rural areas. It is necessary to work on health promotion, prevention of diseases, promotion of positive values and the importance of the family to reduce the negative effects of the society.

FUNDING

No specific funding was received for this study.

TRANSPARENCY DECLARATION

Conflicts of interest: None to declare.

REFERENCES

1. Abazović E, Hasanbegović S, Kovačević E, Okanović I, Kazazović E, Ademaj Z, Lakota R, Mekić A. Obesity in primary school children in Sarajevo Canton: The results of a survey conducted on 33,200 children. Sarajevo: Ministry of Education, Science and Youth of Sarajevo Canton, Ministry of Health of Sarajevo Canton, 2016.
2. Holstein EB, Currie C, Boyce W, Damsgaard TM, Gobina I, Kökönyei G, Hetland J, Looze M, Richter M, Due P; HBSC Social Inequalities Focus Group. Socio-economic inequality in multiple health complaints among adolescents: international comparative study in 37 countries. *Int J Public Health* 2009; 54:260-70.
3. Pirouznia M. The influence of nutrition knowledge on eating behaviour – the role of grade level. *Nutr Food Sci* 2001; 31:62-6.
4. Kuzman M, Pavić-Šimetin I, Pejnović-Franelić I. Health behavior in school-aged children in 2009/2010 – children and youth in the social environment: Results of the research for Croatia and the City of Zagreb/The Health Behaviour in School-aged Children/. Croatian Institute for Public Health Zagreb, 2012 https://www.hzjz.hr/wp-content/uploads/2013/11/HBSC_10.pdf (17 May 2018).
5. Morgan A, Haglund B. Social capital does matter for adolescent health: evidence from the English HBSC study. *Health Promot Int* 2009; 24:363-72.

6. Lesco G. Behavioral and social determinants of adolescent health: Summary report of the health behaviors in school-aged children (HBSC) study in the Republic of Moldova, Chisinau. Ministry of Health of Republic Moldova, WHO Regional office for Europe, 2015 <http://md.one.un.org/content/dam/unct/moldova/docs/pub/HBSC%20report%20Moldova%20en.pdf> (17 May 2018).
7. Stevanović R, Capak K. Istraživanje o zdravstvenom ponašanju učenika. Osnovni pokazatelji zdravlja i dobrobiti učenika i učenica u Hrvatskoj 2013/2014. Zagreb: Croatian Public Health Institute, 2016 <https://www.hzjz.hr/wp-content/uploads/2016/03/HBSC2014.pdf> (17 May 2018).
8. Degač A. Croatian food policy. Zagreb: Croatian Institute of Health, 2001.
9. Capak K, Colić-Barić I, Musić-Milanović S, Petrović G, Pucarín-Cvetković J, Jureša V, Pavić-Šimetin I, Pejnović-Franelić I, Pollak L, Bošnjir J, Pavić E, Martinis I, Švenda I, Krajačić M, Martinis O, Gajari D, Keškicić V, Horvat-Vrbanac M, Predavec S, Grgurić-Štimac V. National guidelines for nutrition of pupils in elementary schools. Zagreb: Ministry of Health of the Republic of Croatia, 2013. content/uploads/2015/05/Nacionalne_smjernice_za_prehranu_ucenika_u_osnovnim_skolama.pdf (17 May 2018).
10. Zulić E. Nutrition habits of school children in the Zenica-Doboj Canton as a public health problem. University of Zenica, Zenica 2015; MA thesis.
11. Paklarčić M, Kukić E, Karakaš S, Osmani Z, Kerić E. Nutrition and differences in the diet of school children in urban and rural areas in the municipality of Travnik. *Food in Health and Diseases* 2013; 2:50-7.
12. Ivanušec M. Nutrition of children in elementary school. University North Varaždin, Varaždin 2015; MA thesis.
13. Grosso G, Marventano S, Nolfo F, Rametta S, Bandini L, Ferranti R, Bonomo MC, Matalone M, Galvano F, Mistretta A. Personal eating, lifestyle, and family-related behaviors correlate with fruit and vegetable consumption in adolescents living in sicily, southern Italy. *Int J Vitam Nutr Res* 2013; 83:355-66.
14. Hoffmann K, Bryl W, Marcinkowski JT, Rzesos A, Wojtyła E, Pupek-Musialik D. Dietary behaviours of adolescents from urban and rural areas in the district of Szamotuły – a preliminary study. *Ann Agric Environ Med* 2012; 19:103-7.
15. Shi Z, Lien N, Kumar BN, Holmboe-Ottesen G. Socio-demographic differences in food habits and preferences of school adolescents in Jiangsu Province, China. *Eur J Clin Nutr* 2005; 59:1439-48.
16. Mancino L, Todd J E, Guthrie J, Lin B H. How food away from home affect children's diet quality. Washington: US Department of Agriculture, Economic Research Service 2010; 104.
17. Rawal LB, Biswas T, Khandker NN, Saha SR, Bidat Chowdhury MM, Khan ANS, Renzaho A. Non-communicable disease (NCD) risk factors and diabetes among adults living in slum areas of Dhaka, Bangladesh. *Plos One* 2017; 12:e0184967. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5626026/> (17 May 2018).
18. Semba RD, Moench-Pfanner R, Sun K, Pee S, Akhter N, Rah JH, Campbell AA, Badham J, Bloem MW, Kraemer K. Consumption of micronutrient-fortified milk and noodles is associated with lower risk of stunting in preschool-aged children in Indonesia. *Food Nutr Bull* 2011; 32:347-53.
19. Minaker LM, McCargar L, Lambraki I, Jessup L, Driezen P, Calengor K, Hanning RM. School region socio-economic status and geographic locale is associated with food behaviour of Ontario and Alberta adolescents. *Can J Public Health* 2006; 97:357-61.
20. Xavier IC, Hardman CM, Andrade ML, Barros MV. Frequency of consumption of fruits, vegetables and soft drinks: a comparative study among adolescents in urban and rural areas. *Rev Bras Epidemiol* 2014; 17:371-80.
21. Currie C, Gabhainn SN, Godeau E, Roberts C, Smith R, Currie D, Pickett W, Richter M, Morgan A, Barnekow V. Inequalities in young people's health: health behavior in school-aged children – International report from the 2005/2006 survey. Copenhagen: WHO Regional office for Europe, 2008 http://www.euro.who.int/_data/assets/pdf_file/0005/53852/E91416.pdf (17 May 2018).
22. Halimić Š. Result analysis of the youth needs and problems research in Sarajevo Canton. Sarajevo: Ministry of Education, Science and Youth of Sarajevo Canton, Institute for Youth Development KULT, 2016.
23. Villa JK, Silva AR, Santos TS, Ribeiro AQ, Pessoa MC, Sant'Ana LF. Dietary patterns of children and socioeconomic, behavioral and maternal determinants. *Rev Paul Pediatr* 2015; 33:303-10.
24. Kollataj W, Sygit K, Sygit M, Karwat ID, Kollataj B. Eating habits of children and adolescents from rural regions depending on gender, education, and economic status of parents. *Ann Agric Environ Med* 2011; 18:393-7.
25. Lutfiyya MN, Chang LF, Lipsky MS. A cross-sectional study of US rural adults' consumption of fruits and vegetables: do they consume at least five servings daily? *BMC Public Health* 2012; 12:280.