

Navike u ishrani dece – istraživanje ponašanja u vezi sa zdravljem kod dece školskog uzrasta u Republici Srbiji 2017. godine

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Nutritional habits in children – research on health-related habits in schoolchildren in the Republic of Serbia in 2017

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Sažetak

Uvod. Ishrana tokom detinjstva može imati višestruki uticaj na dugoročno zdravlje. Navike u ishrani razvijene tokom detinjstva mogu postati doživotne navike. Propušteni obroci, preskakanje doručka i povećan unos slatkiša su povezani sa prekomernom težinom i gojaznosti. Cilj ovog rada bio je da se istraže navike u ishrani dece školskog uzrasta u Srbiji.

Metod. U radu su korišćeni podaci iz istraživanja “Ponašanje u vezi sa zdravljem kod dece školskog uzrasta u Republici Srbiji 2017. godine”. Za prikupljanje podataka korišćen je standardizovani međunarodni protokol Svetske zdravstvene organizacije. Anketirano je 3 933 učenika, uzrasta jedanaest, trinaest i petnaest godina.

Rezultati. Navika doručkovanja radnim danima pokazuje statistički značajnu razliku po regionima u uzrastima 11 ($p = 0,001$) i 13 godina ($p = 0,000$). U uzrastu 11 godina ($p = 0,046$) najviše dece doručkuje vikendom u Beogradu (92,7%). Po pitanju konzumacije voća regioni se statistički značajno razlikuju u uzrastu 11 godina ($p = 0,006$). U regionu Vojvodine najviše se konzumira voće (37,4%). U Beogradu 5% dece nikad ne jede povrće. U uzrastu 15 godina postoji statistički značajna razlika ($p = 0,046$) u konzumiranju povrća. Najviše se povrća konzumira u Južnoj i Istočnoj Srbiji (25,5%), i Šumadiji i Zapadnoj Srbiji (27,4%). U uzrastu jedanaest godina postoji statistički značajna razlika ($p = 0,016$) u konzumiranju slatkiša po regionima. U Vojvodini je najmanje dece koja nikada nisu konzumirala slatkiše (1,8%).

Zaključak. Na osnovu analiziranih podataka može se zaključiti da se deca uzrasta jedanaest, trinaest i petnaest godina u Republici Srbiji nedovoljno zdravo hrane. Rezultati mogu poslužiti za unapređenje zdravstveno-vaspitanjskih programa, koji vode ka promeni ponašanja.

Ključne reči: deca, adolescencija, zdrava ishrana, stavovi, prevencija

Abstract

Introduction. Childhood nutritional habits may have a tremendous influence on long-term health. Nutritional habits developed during childhood may turn into a lifetime habit. Missed meals, skipping breakfast, and increased intake of sweets are related to overweight and obesity. We aimed to research nutritional habits in schoolchildren in Serbia.

Method. We used the data from the research “Health-related habits in schoolchildren in Serbia in 2017”. We used the standardized international protocol of the World Health Organization for data gathering. We polled 3.933 participants, aged 11, 13, and 15.

Results. The habit of having breakfast, on shooldays days, shows statistically significant difference around regions, for ages 11 ($p = 0,001$) and 13 ($p = 0,000$). At the age of 11 ($p = 0,046$), the majority of children have breakfast on weekends in Belgrade (92,7%). When fruit consumption is concerned, the regions statistically significantly differ for the age 11 ($p = 0,006$). The greatest consumption of fruit is found in the region of Vojvodina (37,4%). In Belgrade, 5% of children never eat vegetables. At the age of 15, there is a statistically significant difference ($p = 0,046$) in vegetable consumption. Most vegetables are consumed in South and East Serbia (25,5%), and Sumadija and West Serbia (27,4%). There is a statistically significant difference ($p=0,016$), at the age of eleven, in sweets consumption, among regions. There are the least children who never consumed sweets (1,8%) in Vojvodina.

Conclusion. Based on analyzed data, we concluded that children aged eleven, thirteen, and fifteen, in the Republic of Serbia, don't eat quite healthy. The results may be useful for the promotion of health-educational programs, which, in turn, may lead to behavioral changes.

Keywords: children, adolescence, healthy nutrition, attitudes, prevention

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Uvod

Znanje, stavovi i ponašanje školske dece predstavljaju faktore koji utiču na navike ponašanja i time na zdravstveno stanje školske dece. Značajan faktor, koji je povezan sa zdravljem školske dece, jesu njihove navike u ishrani. Uticaj ponašanja školske dece na zdravlje je potvrđen brojnim istraživanjima koja se sprovode godinama unazad. Jedno od njih je ispitivanje zdravstvenog ponašanja u vezi sa zdravljem, koje već više decenija sprovode zemlje članice evropskog regiona Svetske zdravstvene organizacije¹. Populacija školske dece je posebno značajna, jer usvaja određene životne navike u vezi sa zdravljem koje se u ovom životnom periodu razvijaju i usvajaju, a na koje se može još uvek uticati i primeniti različite vrste zdravstveno-vaspitnih intervencija u cilju otklanjanja ili modifikacije rizičnih ponašanja.

Zdravom ishranom se smatraju uobičajeni obrasci ishrane koji uključuju adekvatan unos hranljivih materija i dovoljan, ali ne preteran, energetske unos da bi se zadovoljile energetske potrebe organizma². Međutim, mnogi roditelji teško uspostavljaju zdrave obrasce ishrane kod svoje dece, prvenstveno zbog savremenog stila života. Sa druge strane, zdravstveni radnici često nemaju dovoljno vremena ili veština da osnaže roditelje da uspostave zdravu ishranu kod svoje dece². Ishrana tokom detinjstva i adolescencije može imati višestruki kratkoročni i dugoročni uticaj na sveukupno zdravlje³. Nedovoljno unošenje svežeg voća i povrća povezano je sa pojavom niza hroničnih nezaraznih bolesti i povećanjem telesne težine⁴. Globalno, 2,8% svih smrtnih slučajeva i 1,0% svih godina života prilagođenih nesposobnosti (*DALYs*) svake godine mogu se pripisati neadekvatnom unosu voća i povrća⁵. Svetska zdravstvena organizacija ističe da tek nešto više od trećine dece školskog uzrasta u evropskim zemljama svakodnevno konzumira povrće⁶. Zemlje Južne Amerike, Afrike i Jugoistočne Azije prijavljuju najniže količine voća i povrća koje deca unose⁴. Prevalenca prekomerne težine i gojaznosti kod dece i adolescenata su u porastu u skoro svim zemljama kada se analiziraju dostupni podaci od 1990. godine⁷. Praćenje gojaznosti od detinjstva ka odrasloj dobi pokazalo je da navike u ishrani koje su razvijene tokom detinjstva mogu postati doživotne navike u ishrani³. Tokom detinjstva i adolescencije, postizanje adekvatnog unosa hranljivih materija je ključno za zdravlje. Ipak, većina adolescenata ne sledi smernice za uravnoteženu ishranu⁸.

Cilj ovog istraživanja je bio ispitivanje ponašanja u vezi sa ishranom dece uzrasta jedanaest, trinaest i petnaest godina na teritoriji Republike Srbije.

Metod

U istraživanju autora korišćeni su podaci dobijeni iz istraživanja pod nazivom „Istraživanje ponašanja u vezi sa

Introduction

Knowledge, attitudes, and behavior of schoolchildren are factors influencing their habits and therefore their health. An important factor, related to schoolchildren's health, is their nutritional habits. The influence of schoolchildren's behavior on their health is confirmed in numerous researches that were conducted in the past. One of them is the study on health behavior related to health, which has been carried out for a few decades by the countries of the European region of the World Health Organization¹. The schoolchildren population is especially important because they are adopting certain life habits related to their health. These habits, which are developed and adopted at this time of their lives, can still be influenced and different sorts of health-educational interventions may be applied in order to eliminate or modify risky behavior.

Healthy nutrition implies usual patterns of nutrition, including adequate intake of nutritional ingredients and sufficient, but not exaggerated, energetic intake to satisfy the body's energetic needs². However, many parents find it hard to establish healthy nutritional patterns in their children, mostly due to contemporary lifestyle. On the other hand, health workers often lack time or skills to empower parents in their efforts to establish healthy patterns in their children^{2s}. Nutrition during childhood and adolescence may have multiple short-term and long-term influences on all-around health³. Insufficient intake of fresh fruits and vegetables is related to the occurrence of various chronic non-communicable diseases and weight gain⁴. Globally, 2,8% of all deaths and 1,0% of disability-adjusted life years (*DALYs*) each year may be attributed to inadequate intake of fruits and vegetables⁵. The World Health Organization emphasizes that just more than a third of school children in European countries consumes vegetables⁶. Countries in South America, Africa, and Southeast Asia declare the lowest intake of fruits and vegetables in children⁴. The prevalence of overweight and obesity in children and adolescents has been on the rise in almost all countries when available data are being analyzed since 1990⁷. Follow-up of obesity from childhood to adulthood showed nutritional habits developed during childhood may turn into lifetime nutritional habits³. During childhood and adolescence, achieving adequate nutritional ingredients intake is key for one's health. Nevertheless, the majority of adolescents don't follow the guidelines for balanced nutrition⁸.

Our study aimed to research nutrition-related behavior in children aged eleven, thirteen, and fifteen in the Republic of Serbia.

Method

We used the data from the research named "Health-related habits in school children in Serbia", carried out during

zdravljem dece školskog uzrasta u Republici Srbiji” tokom 2017/2018. godine, koju je sprovedli Institut za javno zdravlje Srbije „Dr Milan Jovanović Batut“, Ministarstvo zdravlja i Ministarstvo prosvete, nauke i tehnološkog razvoja, a koji su dodatno obrađeni i analizirani.

Za prikupljanje podataka o zdravstvenom ponašanju školske dece u sprovedenom istraživanju, korišćen je standardizovani međunarodni protokol istraživanja primenom upitnika u skladu sa metodologijom Svetske zdravstvene organizacije (SZO)⁵. Ciljna populacija su bili učenici uzrasta jedanaest, trinaest i petnaest godina. U istraživanje nisu bile uključene škole Kosova i Metohije.

Na osnovu utvrđene međunarodne metodologije, prilagođene za primenu u Republici Srbiji, korišćen je nacionalno reprezentativan uzorak koji je činilo 1 500 dece za svaki uzrast. Kao uzorački okvir korišćen je spisak osnovnih i srednjih škola u Srbiji sa brojem učenika po uzrastu. U istraživanju je korišćen stratifikovan višestapni plan uzorkovanja, pri čemu su izvučeni nezavisni uzorci za sva tri uzrasta. U istraživanju su učestvovala 64 škole za svaki uzrast. Dvadeset šest škola je činilo dopunu ili zamenu u slučaju odbijanja učestvovanja u istraživanju. Definisana su četiri statistička regiona kao geografske oblasti istraživanja: Beograd, Vojvodina, Šumadija i Zapadna Srbija, Južna i Istočna Srbija.

U sprovedenom istraživanju su korišćene dve vrste upitnika - jedan upitnik je bio namenjen učenicima osnovnih škola uzrasta jedanaest i trinaest godina (sa ukupno 68 pitanja). Drugi upitnik se odnosio na učenike starosti petnaest godina (sa ukupno 79 pitanja). Pitanja koja su sadržana u upitnicima su se odnosila na zdravlje i zdravstveno ponašanje školske dece uzrasta jedanaest, trinaest i petnaest godina. Anketiranje je bilo dobrovoljno i anonimno, pri čemu su učenici sami popunjavali anketni upitnik.

Saglasnost za realizaciju populacionog istraživanja dao je etički odbor Instituta za javno zdravlje Srbije „Dr Milan Jovanović Batut“, a takođe je dobijena saglasnost roditelja i ispitanika. Etički odbor Instituta za javno zdravlje Srbije „Dr Milan Jovanović Batut“ dao je saglasnost za sekundarno istraživanje prikupljenih podataka, od strane istraživača, u cilju adekvatnijeg sagledavanja povezanosti ponašanja učenika sa zdravljem i navikama u ishrani. Za sekundarno istraživanje, koje je sprovedeno od strane autora, izdvojeno je pet varijabli koje se odnose na stavove i ponašanje školske dece u odnosu na navike u ishrani i ispitivane su razlike u četiri regiona Srbije. Varijable koje su obuhvaćene ovim istraživanjem su: navika doručkovanja radnim danom, navika doručkovanja vikendom, navika konzumiranja voća, navika konzumiranja povrća, navika konzumiranja slatkiša.

Uzorak je opisan prema uzrastu i polu i prema pripadnosti teritorijalnom regionu, prema frekvencijama i relativnim brojevima. Za potrebe ove studije iz Istraživanja ponašanja u vezi sa zdravljem dece školskog uzrasta, podaci o učenicima uzrasta jedanaest, trinaest i petnaest godina u odnosu na

2017/2018 by the Public Health Institute of Serbia „Dr. Milan Jovanovic Batut“, the Ministry of Health, and the Ministry of Education, Science and Technology development. The data were additionally processed and analyzed.

We used a standardized international research protocol for gathering data on the nutritional habits of schoolchildren. We applied a questionnaire in accordance with the methodology of the World Health Organization (WHO)⁵. The target population was students aged eleven, thirteen, and fifteen. The research didn't include schools in Kosovo and Metohija.

Based on the established international methodology, adjusted for the use in the Republic of Serbia, we used a nationally representative sample, consisting of 1,500 children for each age group. We used the list of primary and secondary schools in Serbia with the number of students and their age, as a sample framework. Our research used a stratified multilayered sampling plan, and independent samples for all three age groups were singled out. The research included 64 schools for each age group. Twenty-six schools were an add-up or a substitute in the case of refusal to participate in the research. Four statistical regions, as geographic research areas, were defined: Belgrade, Vojvodina, Sumadija and West Serbia, and South and East Serbia.

We used two types of questionnaires. One questionnaire was intended for primary schoolchildren, aged eleven and thirteen (68 questions in total). The other questionnaire was intended for students aged fifteen (79 questions in total). Questions from the questionnaire related to health and health behavior of school children aged eleven, thirteen, and fifteen. The poll was voluntary and anonymous and the participants filled the questionnaire on their own.

The consent for the realization of the population research was given by the Ethical Board of the Public Health Institute of Serbia “Dr. Milan Jovanovic Batut”, and we also obtained the consent of the participants and their parents. The Ethical Board of the Public Health Institute of Serbia “Dr. Milan Jovanovic Batut” also gave consent for the secondary research of gathered data, by the researchers, in order to adequately review the connection between students' behavior and health, and nutritional habits. For the sake of secondary research, conducted by the authors, five variables were singled out and they relate to attitudes and behavior of schoolchildren in relation to nutritional habits, and the differences were researched in the four regions of Serbia. Variables included in this research were: a habit of having breakfast on school days, a habit of having breakfast on weekends, a habit of fruit consumption, a habit of vegetable consumption, and a habit of sweets consumption.

A sample was described according to age, gender, territorial belonging, frequencies, and relative numbers. For the purpose of this study, we used data from the research “Health-related habits in school children in Serbia”. The data on students aged eleven, thirteen, and fifteen, in relation to quoted

navedene vrste ponašanja i/ili navike analizirani su u odnosu na teritorijalnu distribuciju prema statističkim regionima Republike Srbije, kao i prema polu i uzrastu (jedanaest, trinaest i petnaest godina). Pošto se radi o kategoričkim varijablama, značajnost razlike učestalosti odgovora ispitanika po regionima, u okviru svake dobne grupe, ispitana je χ^2 testom. Značajnost razlike definisana je na nivou $p < 0,05$.

Ispitivana je razlika u pogledu navika u ishrani kod dece uzrasta jedanaest, trinaest i petnaest godina u četiri regiona Srbije. Uzorak je podeljen po regionima i po uzrastu, a značajnost razlike učestalosti odgovora ispitanika po regionima, u okviru svake dobne grupe, ispitana je χ^2 -testom. Značajnost razlike definisana je na nivou $p < 0,05$. Svi podaci su statistički obrađeni u softveru SPSS 22.0. Rezultati su prikazani tabelarno i grafički.

Rezultati

Školska deca, ukupno 3 933, analizirana ovim istraživanjem, uzrasta jedanaest, trinaest i petnaest godina najčešće su poreklom iz Šumadije i Zapadne Srbije (30%), zatim iz Vojvodine (27,2%), Beograda (22,0%), dok je najmanje školske dece obuhvaćeno istraživanjem sa teritorije Južne i Istočne Srbije (20,9%).

Tabela 1. Distribucija uzorka po regionima

Table 1. Sample distribution by region

Region/ Region	Broj dece / Number of children (3 933)	%
Beograd / Belgrade	864	22,0
Vojvodina / Vojvodina	1 068	27,2
Šumadija i Zapadna Srbija / Sumadija and West Serbia	1 180	30,0
Južna i Istočna Srbija / South and East Serbia	821	20,9

U analiziranom uzorku, najzastupljeniji su dečaci na teritoriji Šumadije i Zapadne Srbije (52,5%), dok su devojčice najzastupljenije na teritoriji Beograda (55,2%).

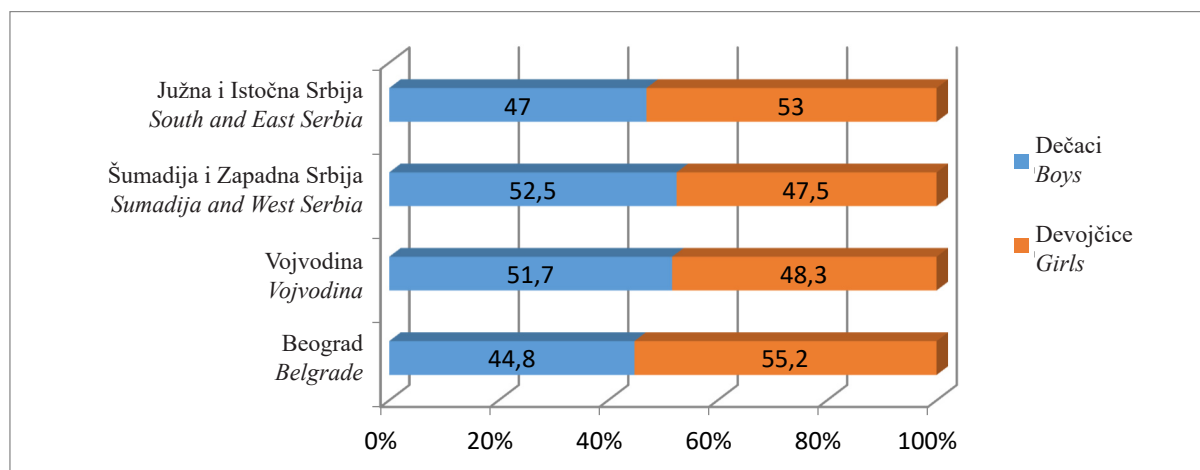
sorts of behavior and/or habits, were analyzed in relation to their territorial distribution according to statistical regions in the Republic of Serbia, as well as gender and age (eleven, thirteen, and fifteen). Since it is about categorical variables, the significance of the difference in the answer frequency of the participants by region, in every age group, was tested by χ^2 test. The significance of the difference is defined at level $p < 0,05$.

We researched the difference concerning nutritional habits in children aged eleven, thirteen, and fifteen in four regions in Serbia. The sample was divided by region and age, and the significance of the difference in answer frequency of the participants by region, in every age group, was tested by χ^2 -test. The significance of difference is defined for level $p < 0,05$. All the data were statistically processed in the SPSS 20.0 software. The results are shown in tables and figures.

Results

A total of 3,933 schoolchildren analyzed in this study, aged eleven, thirteen, and fifteen were mostly from Sumadija and West Serbia (30%), followed by Vojvodina (27,2%), Belgrade (22,0%), and the least were from the region of South and East Serbia (20,9%).

In the analyzed sample, the most prevalent were boys in the region of Sumadija and West Serbia (52,5%), while girls were the most prevalent in the region of Belgrade (55,2%).



Grafikon 1. Distribucija uzorka po polu po regionima (u %)
Figure 1. Sample distribution by gender and region (y %)

Distribucija uzorka po polu, unutar dobnih grupa, pokazuje da je zastupljenost po polu bila ravnomerna u svim dobnim grupama (Tabela 2).

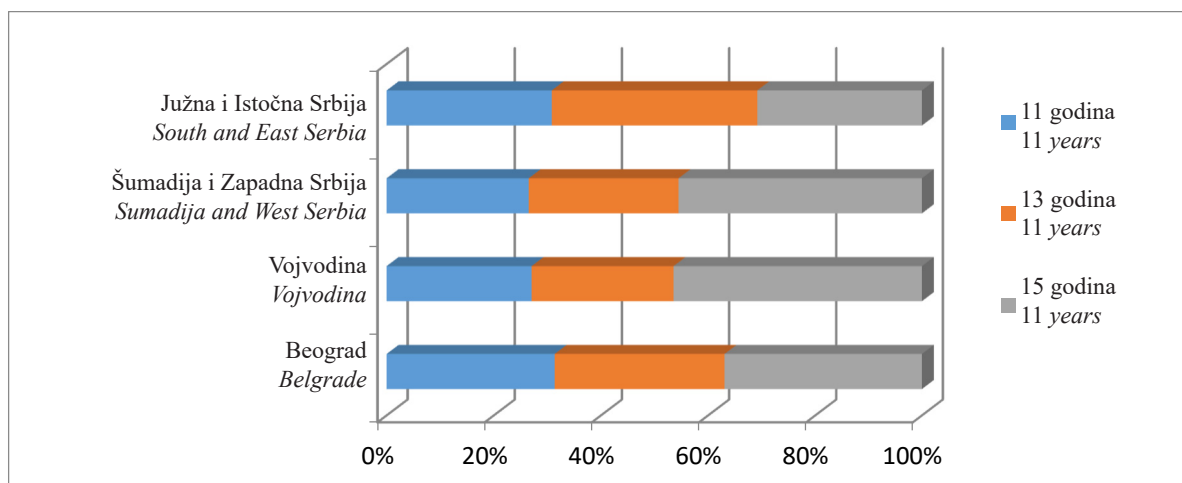
Sample distribution by gender, within age groups, shows the prevalence by gender was even in all age groups (Table 2).

Tabela 2. Distribucija uzorka po polu i dobnim grupama
Table 2. Sample distribution by gender and age group

Uzrast / Age	Dečaci / Boys	Devojčice / Girls	Ukupno / Total
11 godina / years	537 (49,7%)	589 (50,3%)	1 126
13 godina / years	610 (50,7%)	592 (49,3%)	1 202
15 godina / years	798 (47,7%)	807 (52,3%)	1 605

Pošto je uzorak podeljen u odnosu na regione, u grafikonu 2 prikazana je distribucija ispitanika po regionima u odnosu na uzrast. U regionu Južne i Istočne Srbije najzastupljeniji su ispitanici uzrasta 13 godina (38,37%), dok su u ostalim regionima najzastupljeniji ispitanici uzrasta 15 godina (od 36,92 do 46,44%).

Since the sample is divided in relation to regions, Figure 2 shows the distribution of the participants by region and age. In the region of South and East Serbia, the most prevalent are the participants of age 13 (38,37%), while in the other regions, the most prevalent are 15-year-old participants (od 36,92 do 46,44%).



Grafikon 2. Distribucija uzorka po dobnim grupama unutar regiona
Figure 2. Sample distribution by age groups within regions

Rezultati svih testova koji su obuhvatili stav prema navikama u pogledu uzimanja hrane, konzumiranja voća, povrća i slatkiša prikazani su u tabeli 3.

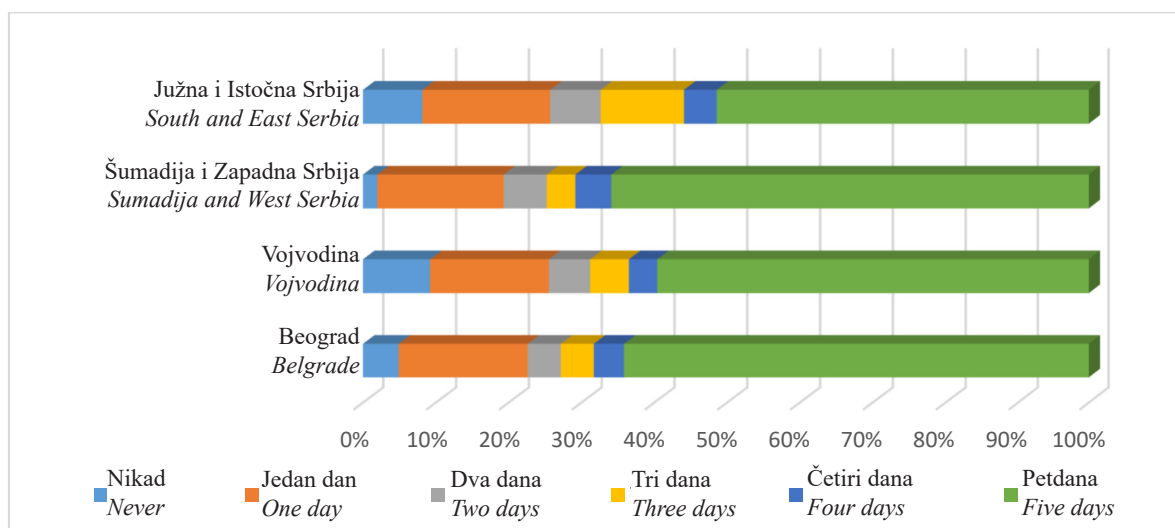
The results of all tests concerning the attitude towards habits in food consumption, fruits, vegetables, and sweets consumption, are shown in Table 3.

Tabela 3. Prikaz rezultata statističkih testova
Table 3. Summary of the results of statistical tests

Pitanje / Question	Uzrast / Age	χ^2	dF	p
Navika doručkovanja radnim danom / Habit of having breakfast on school days	11	38,16	15	0,001
	13	42,29	15	0,000
	15	22,92	15	0,086
Navika doručkovanja vikendom / Habit of having breakfast on weekends	11	12,84	6	0,046
	13	37,59	6	0,000
	15	44,98	6	0,000
Navika konzumiranja voća / Habit of fruit consumption	11	36,69	18	0,006
	13	17,94	18	0,460
	15	17,86	18	0,465
Navika konzumiranja povrća / Habit of vegetable consumption	11	20,91	18	0,284
	13	23,16	18	0,185
	15	29,17	18	0,046
Navika konzumiranja slatkiša / Habit of sweets consumption	11	33,11	18	0,016
	13	24,47	18	0,140
	15	25,82	18	0,104

Navika doručkovanja radnim danima pokazuje statistički značajnu razliku po regionima u uzrastima 11 ($\chi^2 = 38,16$; $df = 15$; $p = 0,001$) i 13 godina ($\chi^2 = 42,29$; $df = 15$; $p = 0,000$). U uzrastu 11 godina najmanji broj dece izjasnio se da nikada ne doručkuje radnim danom u Šumadiji (2%), zatim u Beogradu (4,9%), dok je taj procenat značajno veći u Južnoj Srbiji (8,2%), a najveći u Vojvodini (9,2%). Tri puta tokom radnih dana najčešće su rekla da doručkuju deca iz Južne Srbije (11,4%), dok je kod njihovih vršnjaka iz ostalih delova Srbije taj procenat znatno niži (Šumadija i Zapadna Srbija 3,9%, Beograd 4,5%, Vojvodina 5,3%). Ostale varijante navike doručkovanja radnim danima uglavnom su ravnomerne po regionima.

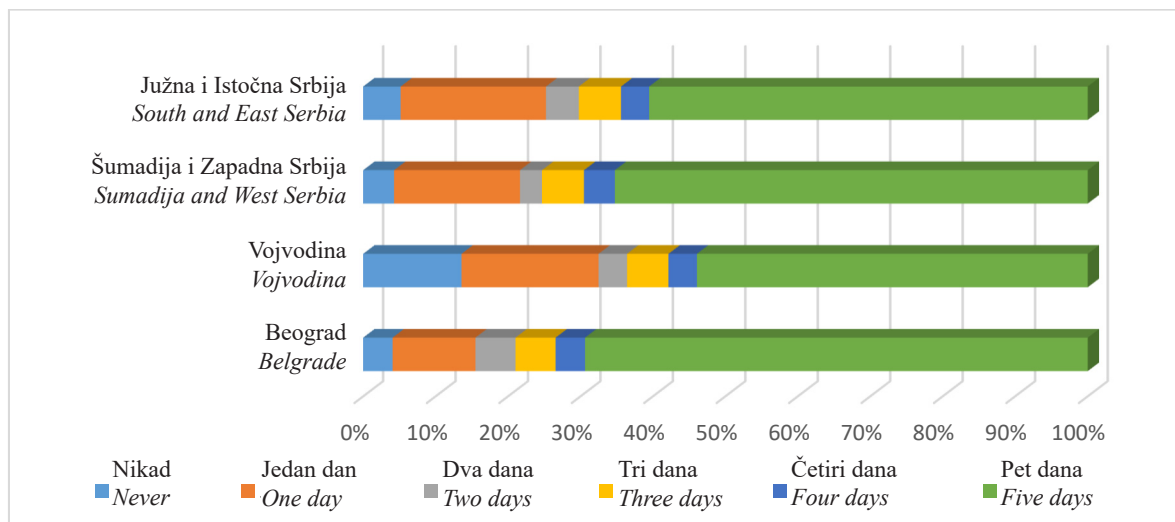
A habit of having breakfast on school days shows a statistically significant difference by region, at ages 11 ($\chi^2 = 38,16$; $df = 15$; $p = 0,001$) and 13 ($\chi^2 = 42,29$; $df = 15$; $p = 0,000$). At the age of 11, the least number of children who declared they never had breakfast on school days was in Sumadija (2%), followed by Belgrade (4,9%), while the percentages in South Serbia were much higher (8,2%), and the highest in Vojvodina (9,2%). Having breakfast three times a week, during school days, was the most prevalent answer among children in South Serbia (11,4%), while in their peers from the other parts of Serbia the percentages were much lower (Sumadija and West Serbia 3,9%, Belgrade 4,5%, Vojvodina 5,3%). Other variants of the habit of having breakfast on school days are mainly even by region.



Grafikon 3. Učestalost navike doručkovanja radnim danima kod dece uzrasta 11 godina po regionima
Figure 3. Incidence of having breakfast on school days in children aged 11 by region

U uzrastu 13 godina najmanji broj dece izjasnio se da nikada ne doručkuje radnim danom u Beogradu (4,1%), zatim u Šumadiji (4,3%) i u Južnoj Srbiji (5,2%), a najveći u Vojvodini (13,6%). Jedanput tokom radnih dana najčešće su rekla da doručkuju deca iz Južne Srbije - svako peto dete (20,1%), dok je kod njihovih vršnjaka iz ostalih delova Srbije taj procenat znatno niži (Šumadija i Zapadna Srbija 17,4%, Vojvodina 18,5%), a najniži u Beogradu (11,4%). Ostale varijante navike doručkovanja radnim danima uglavnom su ravnomerne po regionima.

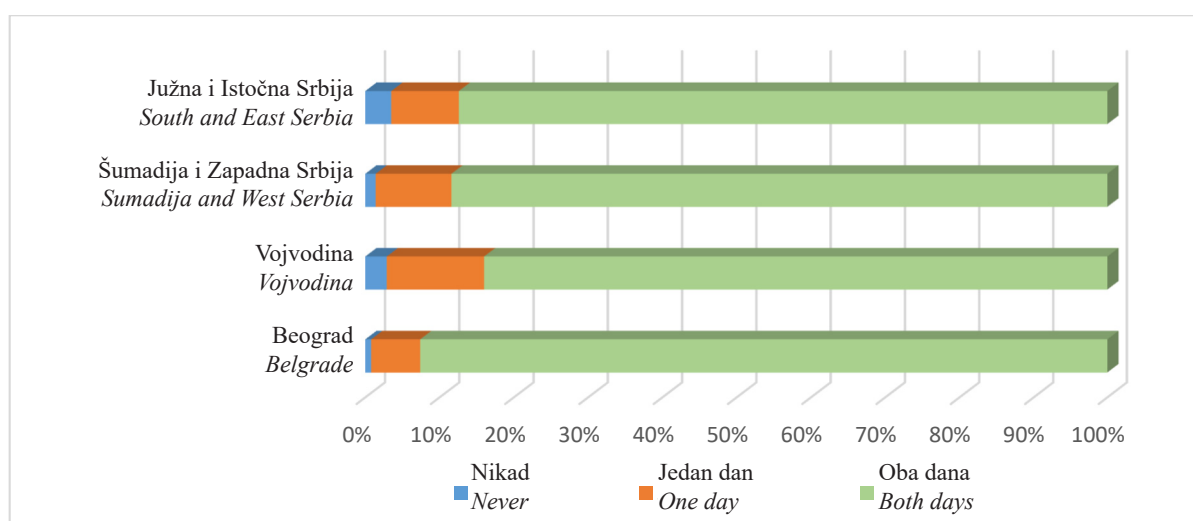
At the age of 13, the lowest number of children who declared they never had breakfast on school days was in Belgrade (4,1%), followed by Sumadija (4,3%), South Serbia (5,2%), and the largest number was in Vojvodina (13,6%). Having breakfast once a week, during school days, was the most common in children from South Serbia, every fifth child (20,1%), while in their peers from the other parts of Serbia, this percentage was much lower (Sumadija and West Serbia 17,4%, Vojvodina 18,5%), and the lowest in Belgrade (11,4%). Other variants of the habit of having breakfast on school days were mainly even by regions.



Grafikon 4. Učestalost navike doručkovanja radnim danima kod dece uzrasta 13 godina po regionima
Figure 4. Incidence of having breakfast on school days in children aged 13 by region

Navika doručkovanja vikendom pokazuje statistički značajnu razliku po regionima u svim uzrastima. U uzrastu 11 godina ($\chi^2 = 12,84$; $dF = 6$; $p = 0,046$) najviše dece doručkuje oba dana vikenda u Beogradu (92,7%), samim tim, najmanje dece je bez doručka vikendom u Beogradu (0,8%) ili doručkuje samo jedan dan tokom vikenda (6,6%) u poređenju sa svim ostalim regionima.

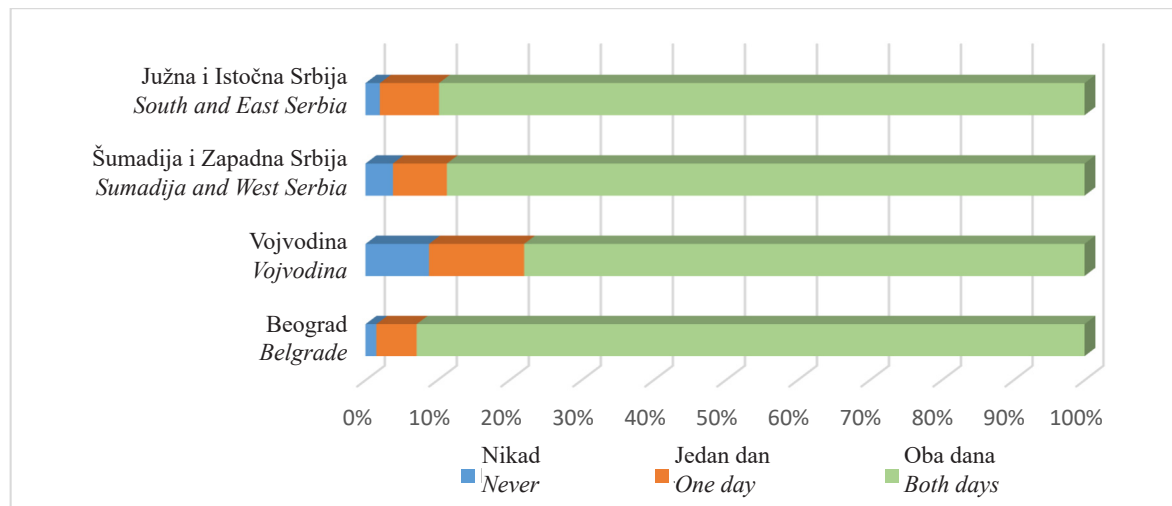
The habit of having breakfast on weekends shows statistically significant difference by region in all age groups. At the age of 11 ($\chi^2 = 12,84$; $dF = 6$; $p = 0,046$), the largest number of children had breakfast on both weekend days in Belgrade (92,7%), therefore, the least number of children without breakfast on weekends is in Belgrade (0,8%) or they had breakfast only on one day during the weekend (6,6%), compared to all other regions.



Grafikon 5. Učestalost navike doručkovanja vikendom kod dece uzrasta 11 godina po regionima
Figure 5. Incidence of having breakfast on weekends in children aged 11 by region

Doručak vikendom u uzrastu 13 godina ($\chi^2 = 37,59$; $dF = 6$; $p = 0,000$) najređi je kod dece iz Vojvodine (nikad 8,8%; jedan dan 13,2%), a najčešći kod dece iz Beograda (oba dana 92,9%).

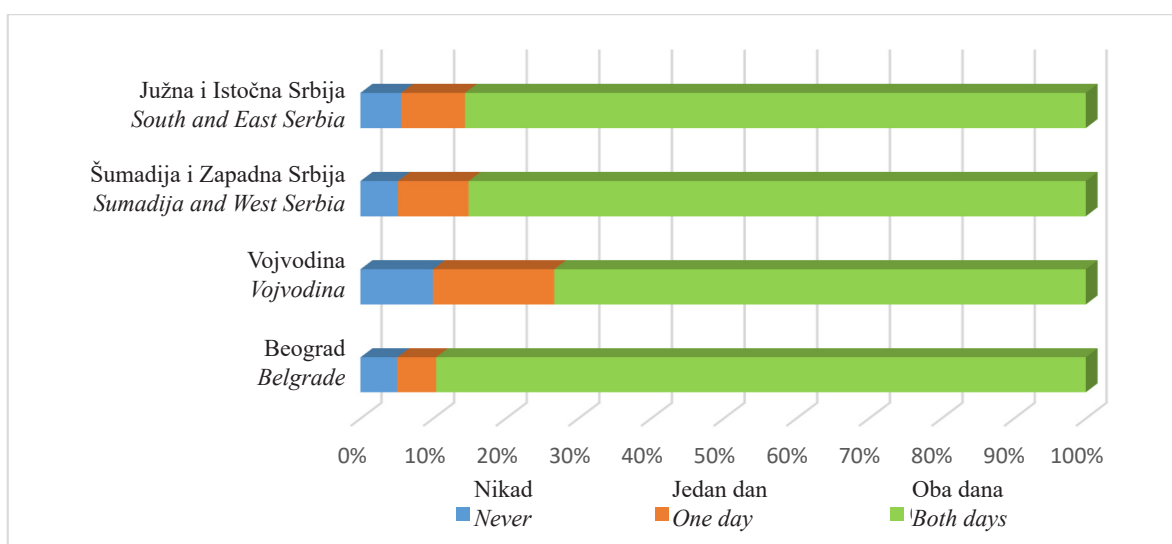
Having breakfast on weekends, at the age of 13 ($\chi^2 = 37,59$; $dF = 6$; $p = 0,000$) is the least common in children in Vojvodina (never 8,8%; one day 13,2%), and the most common in children in Belgrade (both days 92,9%).



Grafikon 6. Učestalost navike doručkovanja vikendom kod dece uzrasta 13 godina po regionima
Figure 6. Incidence of having breakfast on weekends in children aged 13 by region

Situacija je ista u uzrastu 15 godina ($\chi^2 = 44,98$; $dF = 6$; $p = 0,000$), odnosno najčešće oba dana deca doručkuju u Beogradu (89,6%), a najređe u Vojvodini (73,3%) i obratno, najčešće uopšte ne doručkuju deca vikendom u Vojvodini (10%), a u svim ostalim regionima 5,0–5,6%.

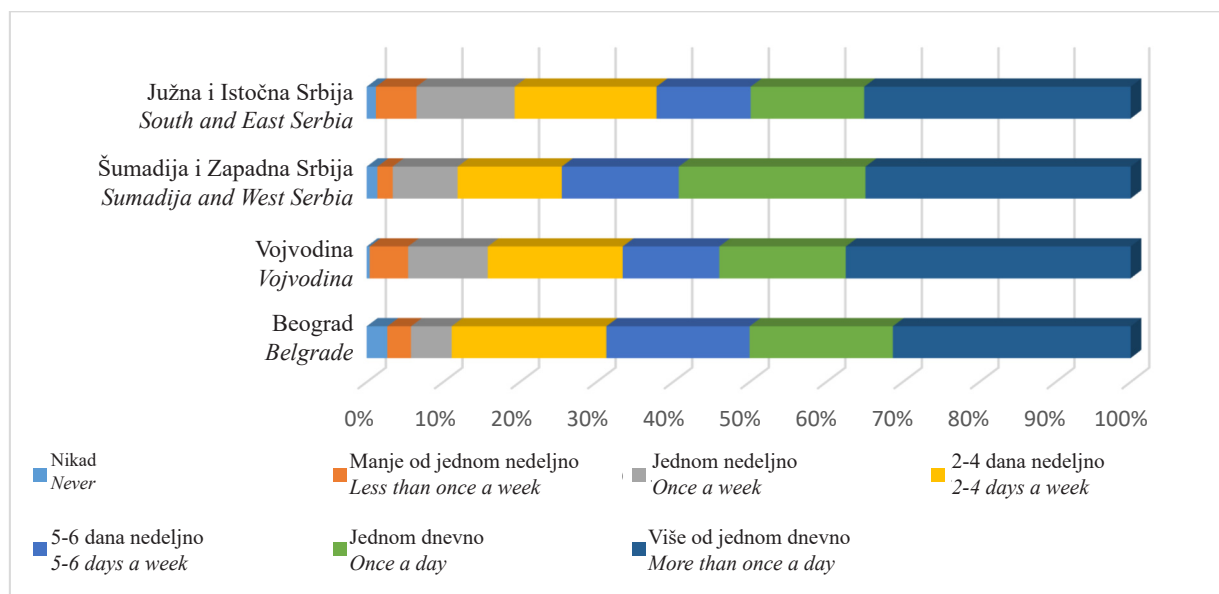
The situation is similar at age 15 ($\chi^2 = 44,98$; $dF = 6$; $p = 0,000$), the largest number of children having breakfast on both weekend days was in Belgrade (89,6%), and the least in Vojvodina (73,3%), and viceverse, the most common was for the children in Vojvodina to not have breakfast on weekends (10%), and in all other regions 5,0–5,6%.



Grafikon 7. Učestalost navike doručkovanja vikendom kod dece uzrasta 15 godina po regionima
Figure 7. Incidence of having breakfast in children aged 15 by region

Po pitanju konzumacije voća regioni se statistički značajno razlikuju samo u uzrastu 11 godina ($\chi^2 = 36,69$; $dF = 18$; $p = 0,006$). U regionu Vojvodine najviše se konzumira voće (37,4% dece jede voće više od jednom na dan). Istovremeno region Vojvodine je onaj gde je najmanje dece koja uopšte ne jedu voće (0,4%). U Šumadiji najviše dece jede voće jednom dnevno (24,4%) u odnosu na ostale regione.

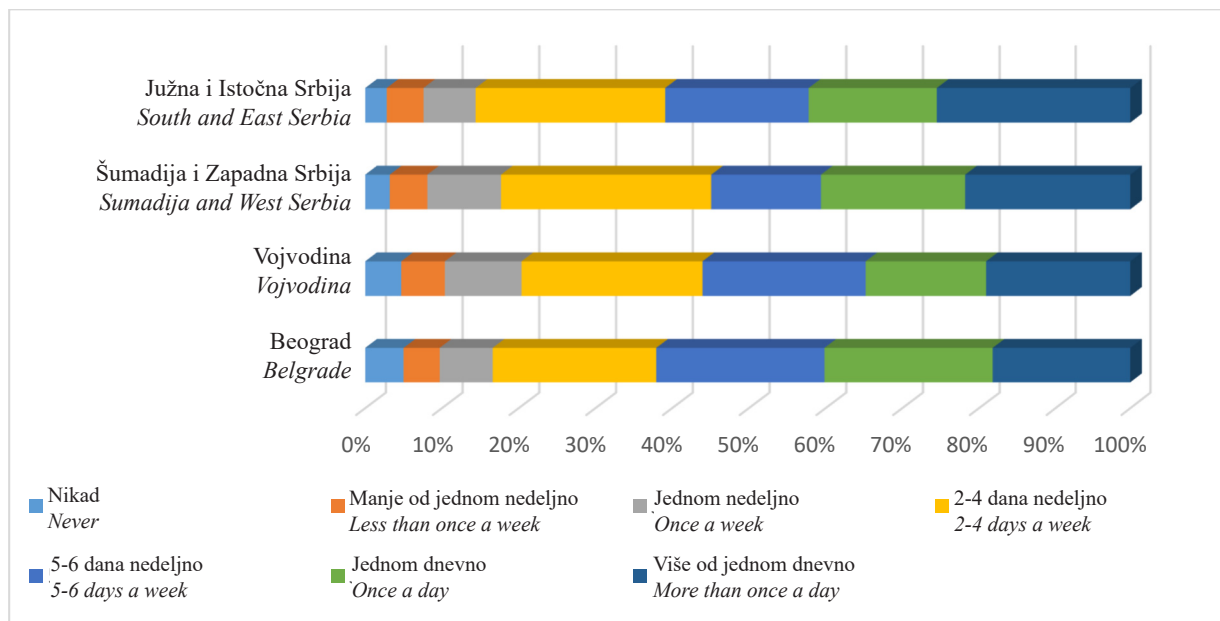
Concerning fruit consumption, regions show statistically significant differences only by age 11 ($\chi^2 = 36,69$; $dF = 18$; $p = 0,006$). Consumption of fruit is the most prevalent in the region of Vojvodina (37,4% of children eat fruits more than once a day). At the same time, the Vojvodina region had the least children who never ate fruits (0,4%). In Sumadija, most children eat fruits once a day (24,4%), compared to other regions.



Grafikon 8. Distribucija učestalosti navike konzumiranja voća kod dece uzrasta 11 godina po regionima
Figure 8. Distribution of incidence of fruit consumption in children aged 11 by region

Samo u uzrastu 15 godina postoji statistički značajna razlika ($\chi^2 = 29,17$; $dF = 18$; $p = 0,046$) u konzumiranju povrća. Najviše se povrća konzumira u regionu Južne i Istočne Srbije (25,5% konzumira više puta dnevno), a u regionu Šumadije i Zapadne Srbije (27,4%) konzumira se najviše 2–4 puta u nedelji. U Beogradu 5% dece nikad ne jede povrće, što je najveća učestalost ove pojave u odnosu na ostale regione.

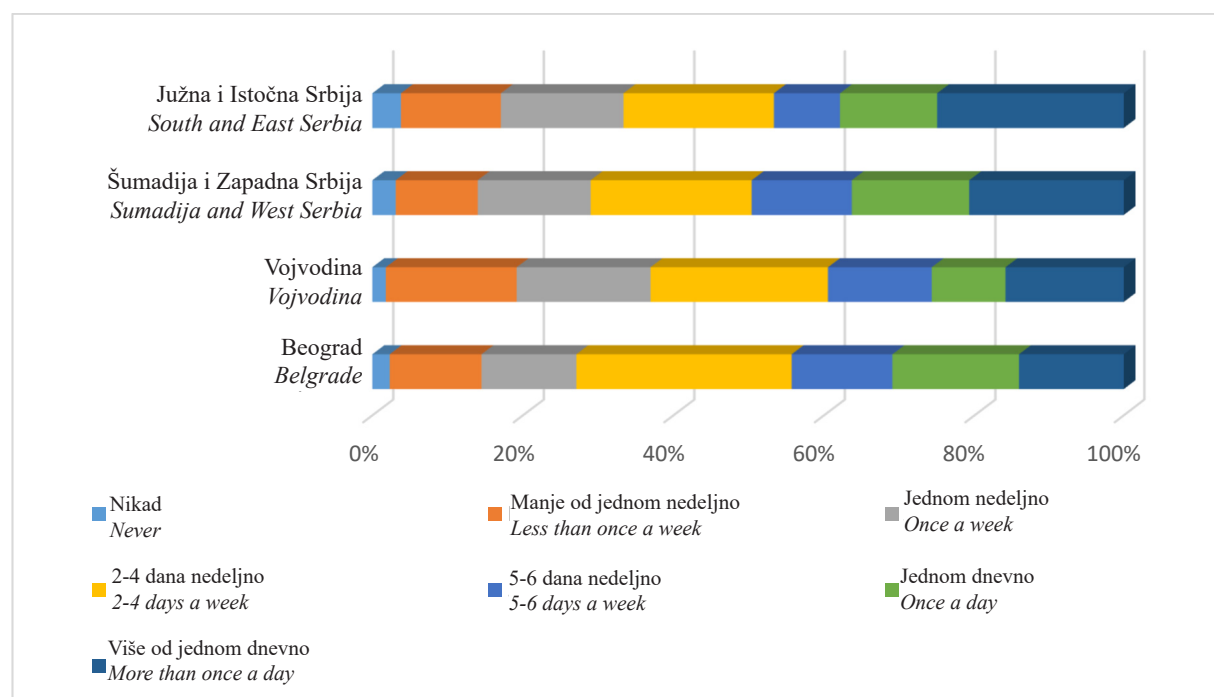
Only at the age of 15 there is a statistically significant difference ($\chi^2 = 29,17$; $dF = 18$; $p = 0,046$) in vegetable consumption. The largest amount of vegetables is consumed in the region of South and East Serbia (25,5% consumes them several times a day), and in the region of Sumadija and West Serbia (27,4%) they are consumed at most 2–4 times a week. In Belgrade, 5% of children never eat vegetables, which is the highest incidence compared to other regions.



Grafikon 9. Učestalost navike konzumiranja povrća kod dece uzrasta 15 godina po regionima
Figure 9. Incidence of consuming vegetables in children aged 15 by region

Jedino u najmlađem uzrastu postoji statistički značajna razlika ($\chi^2 = 33,11$; $dF = 18$; $p = 0,016$) u konzumiranju slatkiša po regionima i to: u regionu Vojvodine najmanji procenat je onih koji nikada nisu konzumirali stakčiše (1,8%); u regionu Vojvodine takođe je najveći procenat onih koji barem jednom nedeljno konzumiraju slatkiše (17,4%).

There is a statistically significant difference only in the youngest age ($\chi^2 = 33,11$; $dF = 18$; $p = 0,016$) concerning consumption of sweets, by region: there is the lowest number of those who never tried sweets in the region of Vojvodina (1,8%); also, in the region of Vojvodina, there is the largest percentage of those who eat sweets, at least once a week (17,4%).



Grafikon 10. Učestalost navike konzumiranja slatkiša kod dece uzrasta 11 godina po regionima
Figure 10. Incidence of sweets consumption in children aged 11 by region

Najveći procenat (28,6%) konzumira slatkiše 2–4 dana u nedelji u Beogradu; najmanji procenat (8,8%) njih jede slatkiše 5–6 dana u nedelji u regionu Južne Srbije, dok su ostala 3 regiona ujednačena. Najmanje (9,8%) njih jede slatkiše jednom dnevno u regionu Vojvodine, a više puta dnevno jede 25% dece u regionu Južne Srbije.

Diskusija

Motivisati decu da svakog dana jedu voće i povrće nije uvek lako. Većina roditelja zna koliko je važno da se zadovolje dečije nutritivne potrebe⁹. Ipak, sa razvijanjem zdravih prehrambenih navika treba početi u ranom detinjstvu. U tom pogledu, izbalansirana ishrana je ključna, jer obezbeđuje sve neophodne sastojke koji su potrebni deci za njihov pravilan rast i razvoj. Takva ishrana se sastoji od tri obroka dnevno i dve užine, koji obuhvataju sledeće grupe namirnica: proteine, ugljene hidrate, voće, povrće, mlečne proizvode i određene masti i šećere⁹. U današnje vreme, suočeni sa velikim brojem obaveza, roditelji nažalost imaju sve manje vremena za spremanje zdravih i ukusnih obroka kod kuće. Ipak, veoma je važno izbegavati zaslađena bezalkoholna pića, brzu hranu i jela koja sadrže visok procenat masti i šećera u ishrani najmlađih. Hrana koja sadrži previše masti i šećera, a male količine ugljenih hidrata može da izazove prejedanje zato što mozak ne registruje signal za sitost.

Navike u ishrani kao npr. propušteni i retki obroci, preskakanje doručka i povećan unos slatkih napitaka, grickalica, kolača i crvenog mesa su povezani sa prekomernom težinom i gojaznosti među decom uzrasta 6–17 godina^{10,11}. Rukovođeci se značajem hranljivih sastojaka, dešava se da roditelji deci prenose pogrešne poruke o tome koliko hrane moraju da unesu u organizam dok ne budu sita⁹. Na taj način oni zapravo uče decu lošoj navici prejedanja koja će ih pratiti celog života. Takav rizik može da se umanjuje ukoliko se deci omogući da prate sopstvene signale za glad i zato ih ne treba navoditi i primoravati da tanjir ostane prazan⁹.

Navika da se radnim danom ne doručkuje posebno je izražena, odnosno zastupljena na teritoriji Vojvodine, u svakoj uzrasnoj dobi, sa tendencijom povećanja u odnosu na uzrast (9,2–13,6%). Sagledavajući navike prisustva, odnosno odsustva doručka vikendom, važno je napomenuti da je u visokom procentu, oko 90%, doručak zastupljen u regionu Beograda, dok u Vojvodini ima tendenciju povećanja procenta dece koja nikada ne doručkuju u svim uzrastima (2,9–10,0%), što može imati značajne posledice po zdravlje. Rezultati iz Južne Afrike i Velike Britanije pokazuju da više od 60% dece u ranoj i srednjoj adolescenciji redovno konzumira doručak radnim danom^{10,12}, što rezultate naše studije dovodi u nekonzistentnost sa ovim rezultatima. Druga studija poredi rezultate redovnog doručka među decom koja žive u urbanim i ruralnim sredinama, i prema tim rezultatima u *Cape Town*, glavnom gradu Južnoafričke republike, 22% adolescenata preskače

The highest percentage (28,6%) of children consumed sweets 2–4 days a week, in Belgrade; the lowest percentage (8,8%) of children ate sweets 5–6 days a week, in the region of South Serbia, while the other 3 regions were balanced. The least of them (9,8%) ate sweets once a day, in the region of Vojvodina, and many times a day 25% of children in the region of South Serbia.

Discussion

To motivate children to eat fruits and vegetables every day is not an easy feat. Most parents know how important it is to satisfy children's nutritional needs⁹. Nevertheless, healthy nutritional habits should be initiated in the early childhood. Therefore, balanced nutrition is the key because it supplies all the necessary ingredients that children need for proper growth and development. Such nutrition consists of three meals and two snacks a day and includes these groups of nutrients: proteins, carbohydrates, fruits, vegetables, dairy, and certain fats and sugars⁹. Nowadays, confronted with a huge number of obligations, parents, unfortunately, have less time to prepare healthy and delicious meals at home. Anyway, it is very important to avoid sweetened soft drinks, fast food, and meals rich in fats and sugar in the nutrition of young children. Food rich in fats and sugar and low in complex carbohydrates may cause overeating because the brain doesn't register a satiety signal.

Nutritional habits, such as missed or rare meals, skipping breakfast, and a large intake of sweetened beverages, snacks, cakes, and red meat are related to overweight and obesity among children aged 6–17^{10,11}. Guided by the importance of nutritional ingredients, some parents misjudge the amount of food their children need to take to be sated⁹. That way, they ingrain a bad habit of overeating to their children and it may follow them their whole lives. Such risk could be lowered by enabling children to follow their own signals for hunger, therefore, they shouldn't be forced to empty the plate⁹.

The habit of not having breakfast on school days is especially prominent in the region of Vojvodina, in all age groups, with an increased tendency in relation to age (9,2–13,6%). Looking at the habits of having, or not having breakfast on weekends, it is important to notice that in Belgrade children have breakfast on weekends in very high percentage, 90%, while in Vojvodina this has the tendency to deteriorate further, and 2,9–10,0% of children of all ages never have breakfast on weekends. This may cause significant health consequences. The results from South Africa and Great Britain show that more than 60% of children in early and mid-adolescence regularly consume breakfast every day on school days^{10,12}, which is inconsistent with the results of our study. Another study compares the results of regular breakfasting among children who live in urban and rural areas, and according to the results

doručak radnim danom, pa možemo primetiti da deca u Srbiji češće doručuju tokom radne nedelje¹³. Takođe, rezultati naše studije pokazuju bolje rezultate u poređenju sa rezultatima dobijenim u SAD, gde 19% školske dece redovno doručuje pre polaska u školu¹⁴. U vezi sa načinom ishrane u kući, neredovno konzumiranje doručka tokom radne nedelje i vikendom, i neredovno praktikovanje glavnog obroka sa porodicom predstavlja značajan rizik od prekomerne težine i gojaznosti¹⁰, što su i pokazale studije u UAE, Brazilu, SAD i Evropi^{15,16}.

Nedovoljna konzumacija voća i povrća u detinjstvu povećava rizik od budućih nezazarnih bolesti, uključujući kardiovaskularne bolesti⁴. Navike u vezi sa konzumiranjem voća pokazuju statistički značajnu razliku samo u najmlađem uzrastu (11 godina), gde je voće zastupljeno u visokom procentu i to više od jednom dnevno u Vojvodini (37,4%), što se može povezati i sa navikom u vezi doručka.

Najčešće deca školskog uzrasta konzumiranje voća ne doživljavaju kao obrok. U pogledu konzumiranja povrća više puta na dan, najveći je procenat zabeležen u Južnoj i Istočnoj Srbiji (25,5%) u uzrastu 15 godina, gde je statistička razlika najizraženija. U Beogradu, u istom uzrastu, 5% dece nikada ne jede povrće. Do istih rezultata su došli istraživači u Centralnog i Južnoj Africi, gde su kod dece istog uzrasta bile najmanje zastupljene grupe namirnica mlečni proizvodi, jaja, voće, meso i povrće^{17,18}. Školska deca u Gani češće konzumiraju voće i povrće (49,9%)¹⁹. Analiza vrste hrane koja se konzumira pokazuje kvalitet nutritivnog profila ishrane i uticaj na telesnu težinu^{17,20}. Unos raznolikih grupa povrća i voća je obrnuto povezan sa prekomernom težinom i gojaznošću, tako da postoji zaštitni efekat raznovrsne ishrane na gojaznost kroz povećanu konzumaciju voća i povrća²¹. Veći unos povrća je značajno povezan sa višim nivoom znanja o značaju pravilne ishrane, i kod deteta i kod roditelja²². Interesantno istraživanje sprovedeno je 2017. godine u Velikoj Britaniji u kom rezultati pokazuju da 18% školske dece za doručak konzumiraju voće¹².

U uzrastu 11 godina života zabeležen je najveći procenat konzumiranja slatkiša, čak 2–4 puta nedeljno. U Beogradu je ta zastupljenost 28,6%. Slatkiši se jednom dnevno, odnosno najređe konzumiraju u Vojvodini (9,8%), dok se u visokom procentu čak 25%, odnosno više puta dnevno konzumiraju u regionu Južne i Istočne Srbije. U državi Malavi, na primer, mnoga školska deca (> 80%) redovno konzumiraju šećerom zaslađena pića, hranu bogatu ugljenim hidratima pre odlaska u školu, u školi i posle škole²³. Školska deca u Gani redovno konzumiraju slatkiše u 90,2%¹⁹. Obrasci ishrane sa povećanom konzumacijom bezalkoholnih pića, slatkiša, grickalica i mesa su pozitivno povezani sa gojaznošću³. Istraživači iz Kine su utvrdili da je unos hrane bogate šećerom povezan sa drugim faktorima ishrane povezanim sa gojaznošću, kao što su zasićene masti. U njihovoj studiji deca koja su konzumirala više slatke hrane takođe su konzumirala više

in *Cape Town*, the capital of the South African Republic, 22% of adolescents skip breakfast on school days, so it's noticeable that children in Serbia have breakfast more often during the school week¹³. Also, the results of our study show better results when compared to those from the USA, where 19% of school children have regular breakfasts before school¹⁴. Nutritional habits at home, such as irregular breakfasting during the school week and on weekends, and irregular main meal consumption with the family present a huge risk for overweight and obesity¹⁰, which was documented in studies from the UAE, Brazil, USA, and Europe^{15,16}.

Insufficient consumption of fruits and vegetables during childhood period increases the risk of future non-communicable diseases, including cardiovascular diseases⁴. Habits related to the consumption of fruits show statistically significant difference only in the youngest age (11), where fruits are present in high percentages, and more than once a day in Vojvodina (37,4%), which may be related to breakfast habits.

Children of school age, mostly don't experience fruit consumption as a meal. Given vegetable consumption, several times a day, the highest percentage was recorded in South and East Serbia (25,5%) at the age of 15, and the statistical difference is the most prominent. In Belgrade, in the same age group, 5% of children never eat vegetables. The researchers from Central and South Africa reached the same conclusions and found that children in the same age group least consumed these nutritional groups – dairy, eggs, fruits, meat, and vegetables^{17,18}. School children in Ghana consume fruits and vegetables more often (49,9%)¹⁹. The analysis of the sort of food that is being consumed shows the quality of the nutritional profile of diet and its influence on body weight^{17,20}. The intake of varied groups of vegetables and fruits is inversely related to overweight and obesity, so there is a protective effect of varied diets on obesity through increased consumption of fruits and vegetables²¹. An increased intake of vegetables is significantly connected with a greater knowledge of the importance of proper diet, in children and parents²². An interesting study, conducted in 2017 in Great Britain, showed that 18% of schoolchildren consume fruits for breakfast¹².

At the age of 11, there was the highest percentage of sweets consumption, even 2–4 times a week. In Belgrade, the incidence was 28,6%. Sweets are consumed once a day, which is the rarest, in Vojvodina (9,8%), while very high consumption, even 25%, and multiple times a day, is found in the region of South and East Serbia. In the state of Malavi, for example, many schoolchildren (> 80%) regularly consume sugar-sweetened drinks, and food rich in carbohydrates, before day go to school, during school, and after it²³. Schoolchildren in Ghana regularly consume sweets in 90,2% of cases¹⁹. Nutritional patterns with an increased consumption of soft drinks, sweets, snacks, and meat are in positive correlation with obesity³. Researchers from China established that the intake of food rich in sugar relates to other nutritional factors

crvenog i prerađenog mesa³. Često se dešava da deca steknu odbojnost prema određenim namirnicama ukoliko su primorana da ih pojedu. Nije dobro ni potpuno isključiti slane grickalice i slatkiše iz njihove ishrane ili deliti hranu na „dobru“ i „lošu“⁹. Slatkiši mogu da budu deo zdrave ishrane sve dok je njihovo konzumiranje ograničeno i ukoliko se ne koriste kao nagrada⁹.

Adolescenti globalno konzumiraju premalo voća i povrća i previše kalorične hrane, i pića siromašnih hranljivim materijama (npr. slatka pića, brza hrana i grickalice)²⁴. Na to utiče i dostupnost u kući takve vrste hrane (36,5%), ali isto tako i model ponašanja roditelja, kao i saveti koje pružaju deci u vezi sa zdravom ishranom²⁴. Potrebno je ponuditi detetu širok spektar zdravih namirnica koje se lako pripremaju, kao što su voće i povrće. Na taj način, roditelji mogu da utiču na detetov izbor hrane, jer postoji veća verovatnoća da će oni početi da uživaju u namirnicama i jelima koja im se serviraju i nude iz dana u dan⁹. Takođe, deca usvajaju navike u ishrani prateći primer roditelja, ostalih članova porodice i osoba iz svog okruženja. Tako će se u većini slučajeva zdravo hraniti ukoliko vide da njihovi roditelji, drugovi i braća i sestre takođe rado konzumiraju takvu vrstu hrane⁹. Sve navedeno ukazuje na neophodnost intenzivnog preventivnog rada sa svim kategorijama stanovništva kako bi se trajno usvojio zdrav način života i sprečilo nastajanje gojaznosti^{255 kg/m² (SD 4.73)}. Roditelji koji svojoj deci od malih nogu razvijaju zdrave navike u ishrani pozitivno utiču i na njihove prehrabene navike kasnije u životu.

Zaključak

Na osnovu analiziranih podataka može se zaključiti da se deca uzrasta jedanaest, trinaest i petnaest godina u Republici Srbiji nedovoljno zdravo hrane. Navike u vezi sa ishranom pokazuju statistički značajnu razliku po regionima. Deca školskog uzrasta ne doručuju redovno tokom radne nedelje i vikendom. Svakodnevnu naviku unosa voća i povrća ima samo oko petina učenika. Skoro polovina ispitivane dece svakodnevno koristi slatkiše u ishrani. Rezultati do kojih se došlo u pogledu ponašanja školske dece u vezi sa zdravim navikama u ishrani mogu uticati na unapređenje zdravstveno-vaspitnih programa, koji vode ka promeni ponašanja. Sagledavanjem statistički analiziranih podataka o načinu ishrane dolazi se do saznanja koja mogu imati značajan uticaj na unapređenje preventivnih aktivnosti u radu sa decom školskog uzrasta, a u cilju razvijanja pozitivnih navika u vezi sa ishranom.

connected with obesity, such as saturated fats. In their study, the children who consumed more sweet food also consumed more red and processed meat³. It often happens that children breed dislike towards certain foods if they are forced to eat them. It's not advisable to completely cut off salty snacks and sweets from their diet, or divide food into “bad” and “good”⁹. Sweets may be a part of healthy nutrition as long as their consumption is limited and is not used as a reward⁹.

Adolescents, globally, consume too little fruits and vegetables, and too much food high in calories, also drinks poor in nutritional ingredients (i.e. sweet drinks, fast food, and snacks)²⁴. It is influenced by the availability of such foods at home (36,5%) but also by the parents' model behavior and the advice they give their children about healthy diet²⁴. It is necessary to offer a child a wide variety of healthy foods that are easily prepared, such as fruits and vegetables. That way, parents may influence a child's food choice because there is a greater probability that the child will start to enjoy the foods and meals they are served and offered day in, day out⁹. Also, children adopt nutritional habits following in their parent's footsteps, but other family members and people from their surroundings as well. They will mostly have a healthy diet if they see their parents, friends, brothers, and sisters gladly consume such foods⁹. All the above points to the necessity of intensive preventive work with all population categories so they could permanently adopt healthy lifestyles and prevent the onset of obesity^{255 kg/m² (SD 4.73)}. Parents who teach their children to adopt healthy habits from early childhood will have a positive influence on their dietary habits later in life.

Conclusion

Based on the analyzed data, we may conclude that children aged eleven, thirteen, and fifteen in the Republic of Serbia don't have quite a healthy diet. Dietary habits show statistically significant difference by region. Schoolchildren don't have breakfast regularly during school days and on weekends. A habit of everyday intake of fruits and vegetables is found in only a fifth of students. Almost half of the participants consume sweets every day. The results we reached, related to healthy nutritional habits of schoolchildren may influence the improvement of health-educational programs that lead to a change of behavior. Reviewing statistically analyzed data on nutritional habits we reached the conclusions that might have significant influence on promotion of preventive activities in schoolchildren in order to develop positive diet related habits.

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