POPULATION BASED SELF-REPORTED ACUTE GASTRO-INTESTINAL INFECTION IN SLOVENIA: MULTIPLIER STUDY
POPULACIJSKA ŠTUDIJA AKUTNIH ČREVESNIH OKUŽB V SLOVENIJI: OPREDELITEV MULTIPLIKATORJA

Eva Grilc[1], Maja Sočan[1]

Abstract

Background: *The assessment of the incidence of acute gastrintestinal infections (AGI) derived from the notifications underestimates the real burden of AGI. The symptoms of AGI are usually not severe enough for consultation with a physician. The more exact data on the burden of AGI are gained through cross sectional population-based studies. To estimate the burden of AGI in Slovenia, a period prevalence study was conducted.*

Methods: *A simple random sample consisting of 5000 Slovenian inhabitants was chosen to whom a questionnaire was sent in July 2011. The participants were asked if they experienced AGI in June 2011 according to a symptom-based case definition. The participants were asked to fill in the questionnaire on a paper or via a web page created for study purposes.*

Results: *Out of 5000 participants, 1500 filled out the questionnaire, giving a response rate of 33%. The number of women responding out-numbered men – there were 58% female and 42% male responders. 66 (4.4%) of the responders claimed to have had AGI in June 2011. The incidence rate of acute AGI was therefore 4400 per 100,000 inhabitants. Comparatively, the incidence rate of notified cases in the same month was 78.9 per 100,000 inhabitants. The difference between the incidence of AGI, based on notified cases and incidence, calculated in the first Slovenian cross sectional study, showed that one out of 56 cases of AGI in the community has been notified.*

Conclusion: *the incidence of AGI among the Slovenian population, based on data from our cross sectional study, is as expected higher than the incidence calculated from notification data from the same period.*

Key words: acute intestinal infection, notification, multiplier, population-based study

Izvleček

Izhodišče: *Incidenco akutnih črevesnih okužb (AČO) običajno ocenjujemo na osnovi prijav. S takšnim pristopom pogosto podcenimo dejansko breme AČO v populaciji. Simptomi AČO so redko tako resni, da sta potrebna obisk in nasvet zdravnika. Podatek o dejanskem bremenu AČO pridobimo s presečnimi študijami na vzorcu populacije, zato smo za oceno bremena v slovenski populaciji zasnovali periodično prevalenčno študijo.*

Metode: *V raziskavo smo povabili 5.000 prebivalcev Slovenije, ki so bili izbrani s pomočjo preprostega naključnega vzorčenja. Na preiskovance smo v začetku julija 2011 naslovili vprašalnik. Osrednje vprašanje raziskave je bilo, ali so v juniju 2011 preboleli AČO. Dodatna vprašanja smo postavili tistim preiskovancem, ki so odgovorili, da so imeli v juniju 2011 simptome in znake, ki so se skladali z definicijo AČO. Preiskovanci so imeli možnost odgovoriti prek spletne ankete ali izpolniti vprašalnik v papirnati obliki.*

Rezultati: *Natanko 1.500 preiskovancev je vrnilo izpolnjen vprašalnik (delež odgovorov: 33-odstoten). Vprašalnik je izpolnilo več žensk (58 %) kot moških (42 %). Akutno okužbo prebavil je po lastnih navedbah v juniju 2011 prebolelo 66 (4,4 %) preiskovancev. Incidenčna stopnja AČO je bila 4.400/100.000 prebivalcev Slovenije, kar je bistveno več kot prijavna incidenčna stopnja v istem mesecu (78,9/100.000). Na osnovi prve slovenske presečne študije AČO v populaciji ocenjujemo, da je na vsak prijavljen primer 56 zbolelih v populaciji.*

[1]Institute of Public Health of the Republic of Slovenia, Trubarjeva 2, 1000 Ljubljana, Slovenia
Correspondence to: e-mail: eva.grilc@ivz-rs.si

Zaključek: *Rezultati presečne študije kažejo, da je incidenca AČO slovenskega prebivalstva pričakovano višja od incidence na osnovi prijav v istem obdobju.*

Ključne besede: akutne črevesne okužbe, prijava, multiplikator, populacijska študija

1 INTRODUCTION

Acute gastrointestinal infection (AGI) continues to be an important cause of morbidity and mortality in the developing world as well as in developed countries, accounting for an estimated 1.78 million deaths and 58.7 million disability-adjusted life years (DALYs) (1). To measure the exact burden of AGI by means of epidemiological studies is a demanding task (2).

Assessments of disease burden are often based on singular health metrics such as incidence, prevalence or mortality data alone (3). The incidence of AGI is usually estimated on the basis of notifications. The assessment derived from the notifications underestimates the real burden of AGI. The fact is that many patients with diarrheal diseases do not seek medical help, as vomiting or diarrhoea are mostly self-limiting and of short duration. The second problem is underreporting and under-ascertainment: even when the patient consults a doctor, e.g. suffering from more severe disease or simply in need of certificate for a sick-leave, it is not uncommon that the obligation to notify is overlooked by the physician. The incidence rate of AGI based on notifications is therefore mostly smaller than the real burden of the disease.

The global burden caused by food-borne pathogens remains largely unknown. Importantly, data indicating trends in food-borne infections are limited to a few industrialised countries and even fewer pathogens (4). It has been predicted that the importance of diarrheal disease, mainly due to contaminated food and water, as a cause of death will decline worldwide. However, evidence for such a downward trend is insufficient. This prediction presumes that improvements in the production and retail of microbiologically safe food will be sustained in the developed world and, moreover, will be rolled out to those countries of the developing world increasingly producing food for a global market. In fact, AGI caused by some bacterial pathogens (e.g. salmonellosis in developed countries) have decreased, others have even increased or re-emerged and the epidemiological situation remains dynamic (1). The real burden of all AGI can be assessed only through burden of disease studies.

Many cases of AGI, especially those with a mild clinical picture, are not captured by routine data sources, because they don´t seek medical advice or they do but are not notified. This is a part of a pattern described as the surveillance pyramid (5). Routinely available surveillance data thus underestimate the total AGI burden.

The aim of our study was to reveal part of the burden of AGI in the Slovenian population and to estimate the multiplier for notified cases.

2 METHODS

2.1 Survey case definition

According to the International Collaboration on Enteric Disease "Burden of Illness" (6), a case of AGI is defined as a person reporting three or more loose stools or any vomiting in a 24-hour period that was not due to the consumption of drugs or alcohol, excluding those with cancer of the bowel, irritable bowel syndrome, Crohn's disease, ulcerative colitis, cystic fibrosis, celiac disease or other chronic illnesses with symptoms of diarrhoea or vomiting (7).

2.2 The survey

A study was designed as a period prevalence study using a self-administrated questionnaire. The invited participants were chosen by a simple random method from the Central Population Registry. In 2011, Slovenia had 2,050,189 residents (8). In developed countries, estimates of monthly prevalence of AGI ranges from 4.5% to 11% (6). A minimum of 3754 individuals was required to reach the target sample size. This was calculated based on 11% expected monthly prevalence of AGI and 95% level of confidence, using the formula from the Epi Info 2000 program, Statcalc. The sampling method was simple random sampling, which included 5000 residents from Slovenia. The sampling was performed by the Statistical Office of the Republic Slovenia (SURS) from demographic data for Slovenia in 2011.

The questionnaire, along with the accompanying letter explaining the aim of the study, was sent to the home addresses of all randomly chosen participants on the first of July 2011. The accompanying letter was referred to parents of children and adolescents (less than 18 years of age). The participants (or their parents or guardians) were asked to complete the self-administrated questionnaire. The participants

could choose one of two options given: to answer the questionnaire on a paper and return it by ordinary mail or to give their answers on a webpage. It was clearly stated that they had to answer only once.

The participants answered the questionnaire anonymously. They were asked to disclose their age, gender, level of education, employment status, environment of their permanent residence (urban, rural and the size of the settlement), having a pet in the household or living on a farm, habits of drinking water from the tap and visiting spas.

The main question was whether they experienced AGI in June 2011 according to the "symptoms compatible" with the case definition. There were no additional questions for patients with AGI in June 2011. The participants without AGI were reminded to return the questionnaire anyway. Those who had symptoms of AGI were invited to answer additional questions regarding the possible source of infection, course of the disease and recourse of healthcare.

2.3 National notification system of communicable diseases

Surveillance of acute gastrointestinal infections (AGI) in Slovenia is based on passive notification according to the Law on Communicable Diseases (Official Gazette No. 33/06) and Act on Registration (Official Gazette No. 16/99). A case with AGI classified as A00-A09 (gastrointestinal infection with or without specified microorganisms) according to International Classification of Diseases, 10th revision (ICD-10), has to be notified by a treating physician on a standard notification form. Data collected on the notification form are: name, surname, date of birth, permanent address, date of the beginning of the illness, notification date and the results of microbiological testing (if available).

2.4 Statistical analysis

Data were expressed as mean, median and modus for continuous variables. Categorical variables were described using counts and percentages. Association was assessed by the χ^2 (Chi square test) method or, when appropriate, Fisher's exact test (p value < 0.05 was considered significant).

The formula for incidence rate calculation used was the one described by Rothman & Greenland (9). We calculated incidence rate of AGI as the number of cases that reported episodes of AGI during the 30 days of June 2011 divided by the total number of participants of the study multiplied by 100,000. Incidence rate derived from regular surveillance of communicable diseases in Slovenia was defined as the number of notified AGI cases in June 2011 divided by the total number of residents in June 2011 multiplied by 100,000.

Chi square analysis was applied to identify the factors associated with the occurrence of AGI. We compared the characteristics of AGI cases with those of respondents who did not meet the criteria for classification as cases of AGI.

3 RESULTS

3.1 The survey

Out of 5000 invited participants, 1500 (848 female in 602 male responders (50 did not answer the question about gender), 58% and 42% respectively) answered the questionnaire by mail (1399 or 93%) or via the web page (101 or 7%), giving a total response rate of 33%. Sixty-six (4.4%) responders reported having AGI in June 2011. There were 19 male and 47 female responders with AGI.

In this study, the incidence rate of AGI cases was 4400/100,000 inhabitants. The mean age of AGI cases was 37 years, median 35 years and modus 63 years. The mean age of AGI cases was lower than in healthy participants, whose mean age was 44, median 48 and modus 65 years (p=0.000). A much higher percentage of AGI cases was among children aged < 1 year as shown in Table 2.

Table 1. *Characteristics of survey responders with and without acute gastrointestinal illness in June 2011.*
Tabela 1. *Značilnosti preiskovancev z ali brez akutne črevesne okužbe (AČO) v juniju 2011, ki so posredovali izpolnjen vprašalnik.*

	Responders without AGI/ Preiskovanci brez AČO	Responders with AGI/ Preiskovanci z AČO	p-value/ p-vrednost
Mean age (years)/ Povprečna starost	44	37	0,000
Gender – male (%)/ Spol -moški (%)	40 %	28,7 %	0,030
The highest level of education accomplished*, graduation (%)/ Najvišja stopnja dosežene izobrazbe, končana fakulteta	30%	38%	0,191
Employed*– yes (%)/ Zaposlen – da (%)	48 %	44%	0,002
**Permanent residence – living in smaller settlement/ Stalno prebivališče – živi v manjšem naselju	51%	47%	0,478
Habit of drinking tap water – yes (%/)/ Pije vodo iz pipe - (da)	100%	82%	0,520
Visiting spas – yes (%)/ Obiskuje kopališča – da (%)	0%	10%	0,632
pets in the household/ Živi s hišnimi ljubljenčki	52%	48%	0,338
Living on farm/ Živi na kmetiji	0%	10%	0,000

*for responders over 25 years/ za preiskovance, ki so starejši od 25 let
** responders who live in small villages with less than 4000 inhabitants/ preiskovanci, ki živijo v vaseh z manj kot 4000 prebivalcev

Table 2. *Number of cases with acute gastro-intestinal infection and number of responders by age groups.*
Tabela 2. *Število preiskovancev, ki so imeli akutno črevesno okužbo in število tistih, ki so posredovali vprašalnik po starostnih skupinah.*

Age/ Starost	Number of AGI cases/ Število primerov z akutno črevesno okužbo	Number of responders from the population sample/ Število sodelujočih iz vzorca populacije
< 1 year/ < 1 leto	4	22
> 1 to 6 years/ >1 do 6 let	3	66
> 7 to 15 years/ >7 do 15 let	5	101
> 16 to 30 years/ > 16 do 30 let	27	368
> 31 to 60 years/ >31 do 60 let	10	458
> 60 years/ >60 let	17	407
Unknown/ Neznano	0	12
All/ Vsi	66	1422

The most common clinical symptom described by AGI cases was pain in abdomen (49 cases, 79%), abdominal cramps (39 cases, 59%), vomiting (19 cases, 29%) and fever (17 cases, 26%). Bloody diarrhoea was described by two patients (3%). Fifteen responders with AGI suspected a specific food or water to be associated with the disease. Twenty-four (36%) responders reported that household contacts had similar symptoms. Fifteen responders with AGI travelled abroad just before signs and symptoms of AGI started. Most frequently visited countries were Croatia (6), Italy (3), Spain (2) or others (Turkey, Tunisia, Egypt, Austria).

A physician was consulted by 13 (19.6%) respondents with AGI one to 21 days after AGI started, on average after 3.7 days. Only 3 were asked to provide a stool sample for which there was full compliance. In one case, rotavirus was confirmed; other tests were negative. Three patients with AGI were treated with antibiotics (1.5%). Those who consulted the physician for AGI were on average younger than those who did not (27 versus 36). Half of the patients who visited a doctor were expectedly younger than 10 years (the age ranged from 0.5 to 83 years, median 17.5 years and modus 1 year). One patient, a 2-year-old boy with AGI, was hospitalised. Chi square test showed that the visit to the doctor's office was associated with longer duration of diarrhoea (p=0,000) and fever (higher than 37 °C, p=0.000). The duration of diarrhoea is significantly associated with age of patients (p=0.007) as shown in Table 3.

Table 3. *Age of the AGI cases and the duration of the illness – cross sectional study, June 2011, Slovenia.*
Tabela 3. *Starost bolnikov in trajanje akutne črevesne okužbe prebavil – presečna študija, junij 2011, Slovenija.*

Duration of diarrhea/ Trajanje driske	Preschool children/ Predšolski otroci	School children/ Šolski otroci	Adults 26-64 years/ Odrasli od 26-64 leta	Adults ≥65/ Odrasli nad 65 let	Total/ Skupaj
≤3 days/ ≤3 dni	1 (20%)	16 (72,7%)	21 (80,8%)	2 (28,6%)	40 (66,7%)
≥ 4 days/ ≥4 dni	4 (80%)	6 (27,3%)	5 (19,2%)	5 (71,4%)	20 (33,3%)
All/ Vsi	5 (100%)	22 (100%)	26 (100%)	7 (100%)	60 (100%)*

* Data on duration of diarrhoea was available only for 60 out of 66 cases with AGI.
*Podatki o trajanju driske so bili na voljo samo za 60 od 66 primerov z akutnim gastroenterokolitisom.

From 66 patients reporting AGI in the month of June 2011, almost half (48%) lived in small villages or in remote houses out of settlements. We created the hypothesis that the quality of drinking water coming from local wells in small villages is not of the same quality compared to well-controlled drinking water from big urban systems. Therefore, the inhabitants of small villages might have a greater possibility to become ill with AGI. There was no association found between living in a small settlement and occurrence of AGI (Chi square test; p > 0.05).

3.2 AGI multipliers

In the year 2011, there were 22,335 notified AGI cases, the incidence was 1088.2/100,000 inhabitants.

Approximately 70% of reported AGI cases were coded as A0.9 according to ICD-10 – AGI of unknown aetiology. Rotavirus and *Campylobacter* were the most frequent confirmed agents causing AGI (Annual epidemiologic report 2011; National Institute of Public Health, Slovenia). 1606 notified cases were reported in June 2011 (incidence rate 78.9/100,000 inhabitants).

The age-specific AGI incidence rates derived from the cross-sectional study and notification system are presented in Table 4 with multipliers for age group calculated. The multipliers were calculated by dividing the incidence rate from the cross sectional study with the incidence rate from national surveillance of communicable diseases.

Table 4. *Acute gastrointestinal infection incidence rates (per 100,000) by age groups derived from cross sectional study and surveillance system with the multipliers for age groups.*

Tabela 4. *Incidenčna stopnja (na 100.000) akutnih črevesnih okužb v presečni študiji in prijavljenih primerov z multiplikatorji po starostnih skupinah.*

Age group (years)/ Starostna skupina (leta)	Incidence rate per 100.000 inhabitants (cross sectional survey)/ Incidenčna stopnja na 100.000 prebivalcev (presečna študija)	Incidence rate per 100.000 inhabitants (notification in June 2011) / Incidenčna stopnja na 100.000 prebivalcev (junij 2011)	The multipliers for age group/ Multiplikatorji po starostnih skupinah
≤ 1	18181	83	219
1-6	7777	351	22
7-14	5882	151	39
15- 29	6250	303	21
30-59	3059	432	7
> 60	3703	219	17

4 DISCUSSION

The data derived from regular surveillance of communicable diseases showed that AGI causes a considerable burden in Slovenia. Due to underreporting and under-ascertainment, the burden is still underestimated. To move toward the real burden of AGI, the first population based period prevalence study was carried out in Slovenia.

The response rate was 33%, which is slightly lower compared to a previously published study from Canada (8). There were 66 (4.4%) AGI cases among responders. Only 13 (19%) of them consulted a primary care physician. The estimated incidence rate of acute gastroenteritis in June 2011, based on the cross sectional study, was 4400/100,000 inhabitants. As expected, the estimated incidence rate was much higher in children of ≤6 years (7500/100,000) than in elderly aged ≥61 years (3703/100,000).

The results of the survey showed that AGI incidence rate was 56 times higher than the incidence rate recorded through the passive surveillance system. The multipliers derived from different age groups ranged from 7 to 219. The highest multiplier was in children aged less than one year, the lowest from the 30 to 59 years age group. However, the incidence in the cross sectional study is the estimation of the incidence of all AGI cases in the community. Most of them do not seek medical advice and are therefore not registered.

In studies from New Zealand and Canada, the multiplier was found to be 222 and 347 respectively (10, 11). The study of AGI in the general population in Great Britain showed that along with every notified case of AGI that seeks medical help, there are at least six AGI cases that are not notified (4). In a cross sectional telephone survey in New York, residents were asked about diarrhoea during the 30 days before the interview. Estimated numbers of citywide illnesses were compared to emergency department (ED) visits for AGI that were recorded. One ED visit for AGI represented approximately 250 illnesses in the community (12). The readiness to report and timeliness of notification of communicable diseases depend on the severity of the disease and its public health implications.

There is general awareness that diseases important from a public health point of view and/or causing outbreaks are to be reported (13). The probabilities of visiting a doctor having stool tested and notification of disease are likely to be greater when the illness is more severe, which is dependent on causative agent (13). Most of cases with mild clinical AGI do not seek medical advice and are not notified. The multipliers were calculated for some pathogens (mostly for bacteria), e.g. by determining the average incidence of laboratory-confirmed *Salmonella* infection and adjusting for under-ascertainment using values from the literature. *Salmonella*-specific multipliers range from 3.2 in England, 7 in Australia, 14.3 in the Netherlands, 25 in Canada and 38 in the United States to 64 in Japan (14). An even higher multiplier was found in Jordan: for each person with laboratory-confirmed *Shigella* or *Salmonella* infection, there are about 273 infected persons in the community (15). The multipliers for viruses are probably even higher.

There are some less sensitive options (in comparison to cross sectional multiplier studies) to estimate the burden of AGI. Over the counter (OTC) medications sales of antidiarrheal medication increased during fall and peaked during early winter (16). The increase better

correlated with noroviral outbreaks than the increase of AGI caused by rotaviruses.

We assume that the burden of AGI in Slovenia is probably higher during summer than winter due to the seasonal pattern of AGI. In temperate climates, AGI typically alternate periods of low endemic levels with periods with outbreaks, forming a typical seasonal pattern depending on etiologic agent. *Salmonella* or *Campylobacter* spp. AGI rise in the summer and decline in the winter. Enteric infections caused by the protozoans *Giardia* and *Cryptosporidium* also exhibit seasonal variation, but it is shifted towards autumn (17). In contrast, seasonality is not marked for hepatitis A and shigellosis (17). Infections caused by *Salmonella* and *Campylobacter* closely follow the ambient temperature curve of the environment. Food contamination is believed to be the most significant mode of transmission for *Salmonella* and *Campylobacter*. In contrast, the seasonal increase in *Giardia*, *Shigella* and *Cryptosporidium* infections form a separate cluster peaking a month after the temperature peak, strongly suggesting different route(s) of exposure than for *Salmonella* or *Campylobacter* (17).

The question to be answered is: which pathogen caused the most AGI in our study? Most AGI cases in the present study did not seek medical help due to mild course of the illness and did not have a sample taken. We can only assume that noroviruses and rotaviruses were the most prevalent pathogens causing AGI. According to notification data in Slovenia, the majority of AGI with known pathogen are caused by rotaviruses (26% in the year 2010) and noroviruses (34% in 2010) (18). The same has been found in previous studies – the largest part of the burden in the community is caused by viruses, especially noroviruses, in last few years (19). In a UK study, the incidence rate of norovirus-associated AGI in the community showed a slight peak in the winter and autumn months, while general practice consultations were reasonably constant throughout the year. In the same study in the UK, they found that norovirus is the most common cause of AGI across all age groups in the community (20).

Noroviral gastroenterocolitis has been long considered the second most frequent cause of AGI, far behind rotaviral gastroenteritis. Development of molecular-based diagnostic techniques has provided clearer insight into the epidemiological impact of noroviruses that are now recognised not only as the leading cause of non-bacterial gastroenteritis outbreaks but also as an important cause of sporadic gastroenteritis in both children and adults. The virus is able to survive in the environment for many days, which enables outbreaks

to be prolonged (20). Actually, noroviruses are also recognised as the major causes of waterborne illnesses worldwide (21).

In this study, there were more female than male responders (58% vs. 42%). It seems that women were more willing to answer the survey, which could be a source of bias. Nevertheless, the percentage of males and females with AGI was not statistically significantly different (males 3.1% versus females 5.5%, p-value 0.066), therefore we assume that higher response rate in females had no impact on multiplier assessment. The age structure of responders did not differ significantly from Slovenian age structure and the age distribution of AGI cases was similar as in routine surveillance data. The study population was surveyed in just one month of the year, which is the major limitation of the present study. As the same intestinal pathogens are much more often found during summer and others in cooler months of the year, it might be anticipated that an all year-round study might show more realistic multipliers of AGI. Therefore, extrapolation based on a one month study might be questionable. Multiplier studies in which the selected study population was surveyed for 12 months have been published and give much better insight into multiplier of AGI than one-month studies (22, 23). The main drawback of a one-year multiplier study is high cost. The results gained through such studies done in (usually) wealthier countries cannot be easily translated to other countries and different social environments. WHO explicitly discourages countries from using data from other countries to develop multipliers for extrapolating from reported to true incidence and encourage them to base such estimates on their own studies and case selection (24).

5 CONCLUSION

The incidence of AGI among the population, who mostly did not seek medical advice, based on data from our cross sectional study, is expectedly higher than the incidence calculated from notification data from the same period.

We assume that like in other countries in temperate climates the frequency of AGI during summer is probably higher than in winter due to the seasonal patterns of most AGI. However, to confirm that we should repeat the study in winter.

Furthermore the number of cases and responders in different age groups in our study were quite different, which also influenced the multipliers. We expect that higher percentages of responders enable better

estimates of the multipliers, which is one of the limitations of this study.

Diarrhoea continues to be a major global health problem and there is an ongoing debate over identifying research priorities and effective interventions given the limited funding. Whereas standard clinical trial procedures are often adequate to assess the effect of a vaccine or drug on diarrhoea in individuals, environmental interventions aiming at diarrhoea control are often much more complex and more difficult to evaluate with randomised trials (2).

We assume, like in most countries, that probably most AGI cases in the community are caused by viruses. According to that assumption, if the burden of norovirus and rotavirus infections increased, the multiplier between notified and community based cases of AGI would also rise.

References

1.   Bruyn GD, Bouckenooghe A. Diarrhea. In: Evidence based infectious diseases, 2nd ed. Oxford: Wiley Blackwell, 2009: 98-109.

2.   Schmidt WP, Arnold BF, Boisson S, Genser B, Luby SP, Barreto ML, Clasen T et al. Epidemiological methods in diarrhea studies: an update. Int J Epid 2011; 40: 1678-92.

3.   van Lier EA, Havelaar AH, Nanda A. The burden of infectious diseases in Europe: a pilot study. Eurosurv 2007; 12: Available October 25, 2012 at: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=751Bruyn GD.

4.   Newell DG, Koopmans M, Verhoef L, Duizer E, Aidara-Kane A, Sprong H et al. Food-borne diseases: the challenges of 20 years ago still persist while new ones continue to emerge. Int J Food Microbiol 2011; 145: 493.

5.   O'Brien S, Rait G, Hunter PR, Gray JJ, Bolton FJ, Tompkins DS, McLauchlin J et al. Methods for determining disease burden and calibrating national surveillance data in the United Kingdom: the second study of infectious intestinal disease in the community (IID2 study). Medica Research Methodology 2010; 10: 39. Available September 6, 2013 at: http://www.biomedcentral.com/1471-2288/10/39.

6.   Aguiar PP, Finley RL, Munhaal PK, Guerin MT, Isaacs S, Dominguez AC et al. The burden of self reported acute gastrointestinal illness in Cuba. J Health Popul Nutr 2009; 27: 345-57.

7.   Scavia G, Baldinelli F, Busani L, Caprioli A. The burden of self-reported acute gastrointestinal illness in Italy: a retrospective survey, 2008–2009. Epidemiol Infect 2012; 140: 1193-206.

8.   Prebivalstvo Slovenije, 1. oktober 2011 – končni podatki. Available November 5, 2012 at: http://www.stat.si/novica_prikazi.aspx?id=4481.

9.   Rothman KJ. Measuring disease occurrence and causal fffects. In: Rothmann KJ. Epidemiology: an introduction. Philadelphia, PA: Lippincott-Raven Publishers, 2002: 25-54.

10.   Lake RJ, Adlam SB, Perera S, Campbell DM, Baker MG. The disease pyramid for acute gastrointestinal illness in New Zealand. Epidemiol Infect 2010; 138: 1468-71.

11.   MacDougall L, Majowitz SJ, Dore K, Flint J, Thomas K, Kovacs S et al.. Under-reporting of infectious gastrointestinal illness in British Columbia, Canada: who is counted in provincial communicable disease statistics? Epidemiol Infect 2008; 136: 248-56.

12.   Metzger KB, Hajat A, Crawford M, Mostashari F. How many illnesses does one emergency department visit represent? Using a population-based telephone survey to estimate the syndromic multiplier. MMWR 2004; 24 (Suppl 1): 106-11.

13.   Gauci C, Gilles H, O`Brien S, Mamo J, Calleja N. General practitioners´role in the notification of communicable diseases: study in Malta. Eurosurveill 2007. Available September 11, 2012 at: http://www.eurosurveillance.org/Viewarticle.aspx?Articleid=745.

14.   Majowitz SJ, Scallan E, Angulo JF, Kirk M, O'Brien SJ, Timothy F, Jones TF, Robert AF, Hoekstra M. The global burden of nontyphoidal Salmonella gastroenteritis. Clin Infect Dis 2010; 50: 6882-9.

15.   Gargouri N, Walke H, Belbeisi A, Hadadin A, Salah S, Ellis A et al. Estimated burden of human Salmonella, Shigella, and Brucella infections in Jordan. Foodborne Pathog Dis 2009; 6: 481-6.

16.   Das D, Metzger K, Heffernan R, Balter S, Weiss D, Mostashari F. Monitoring over the counter medication sales for early detection of diseases outbreaks New York City. MMWR 2005; 26: 41-6.

17.   Naumova EN, Jagai JS, Matyas B, DeMaria AJ, MacNeill IB, Griffiths JK. Seasonality in six enterically transmitted diseases and ambient temperature. Epidemiol Infect 2007; 135: 281-92.

18.   Kraigher A, Sočan M, Klavs I, Frelih T, Grilc E, Grgič Vitek M. Epidemiološko spremljanje nalezljivih bolezni v letu 2010. Available November 5, 2010 at: http://www.ivz.si/.

19.   Phillips G, Clarence C. Tam, Conti S, Rodrigues LC, Brown D et al. Community incidence of norovirus-associated infectious intestinal disease in England: improved estimates using viral load for norovirus diagnosis. Am J Epidemiol 2010; 171: 1014-22.

20.   Delacour H, Dubrous P, Koeck JL. Noroviruses: leading cause of gastroenteritis. Med Trop Mars 2010; 70: 111-8.

21.   Leclerc H, Schwartzbrod L, Dei-Cas E. Microbial agents associated with waterborne diseases. Crit Rev Microbiol 2002; 28: 371-409.

22.   Adlam SB, Perera S, Lake RJ, Campbell DM, Williman JA, Baker MG. Acute gastrointestinal illness in New Zealand: a community study. Epidemiol Infect 2011; 139: 302-8.

23.   Wilking H, Spitznagel H, Werber D, Lange C, Jansen A, Stark K. Acute gastrointestinal illness in adults in Germany: a population-based telephone survey. Epidemiol Infect 2013; 141: 2365-75.

24.   WHO. The global view of campylobacteriosis: report of Expert Consultation. Utrecht, Netherlands, 9-11 July 2012. Available October 15, 2013 at: http://www.who.int/foodsafety/publications/foodborne_disease/global_view_campylobacterosis/en/index.html.

DEJAVNIKI KOLEKTIVNEGA PSIHOLOŠKEGA OPOLNOMOČENJA AKTIVNIH UPORABNIKOV SPLETNE ZDRAVSTVENE SKUPNOSTI MED.OVER.NET

FACTORS OF COLLECTIVE PSYCHOLOGICAL EMPOWERMENT OF ACTIVE USERS IN THE ONLINE HEALTH COMMUNITY MED.OVER.NET

Andraž Petrovčič[1], Gregor Petrič[1]

Izvleček

Namen: *V članku raziskujemo v literaturi pogosto spregledano vprašanje kolektivnega psihološkega opolnomočenja uporabnikov spletnih zdravstvenih skupnosti. Izhajajoč iz teorij opolnomočenja s področja psihologije skupnosti, preverjamo, kateri dejavniki, ki obenem odražajo pomembne lastnosti spletnih zdravstvenih skupnosti, so povezani s kolektivnim psihološkim opolnomočenjem njihovih uporabnikov.*

Metode: *Vlogo štirih dejavnikov kolektivnega opolnomočenja smo analizirali s pomočjo multiple linearne regresije na podatkih, zbranih konec leta 2010 s spletno anketo na neverjetnostnem vzorcu (n = 235) aktivnih sodelujočih na forumih največje slovenske spletne zdravstvene skupnosti Med.over.net, ki je vključeval 8,5% moških, 49,7% vsaj visoko izobraženih in 41,5% poročenih anketirancev, ki so bili v povprečju stari 35,1 leta (SD = 9,1).*

Rezultati: *Ugotavljamo, da se predstavljeni teoretični model dejavnikov ustrezno prilega podatkom (F = 8,65, df = 8, p < 0,001) in z njim lahko pojasnimo 23,4% variabilnosti občutka kolektivnega opolnomočenja. Občutek pripadnosti spletni skupnosti (β = 0,279, p < 0,001), vključenost v organizacijske aktivnosti skupnosti (0,194, 0,001) in zaznana participacija spletne skupnosti v širšem okolju (0,157, 0,02) vplivajo na kolektivno opolnomočenje uporabnikov spletne zdravstvene skupnosti Med.over.net, medtem ko tega ni mogoče trditi za intenzivnost participacije v forumskih razpravah (0,029, 0,65).*

Zaključek: *Za povečevanje kolektivne komponente psihološkega opolnomočenja uporabnikov spletnih zdravstvenih skupnosti je treba v prvi vrsti graditi na kakovosti odnosov med člani, vključevanju članov v strateške odločitve o skupnosti in na vključenosti skupnosti v širše družbeno okolje, saj sama participacija uporabnikov v spletnih skupnosti še ne zagotavlja njihovega višjega kolektivnega opolnomočenja.*

Ključne besede: opolnomočenje, občutek pripadnosti skupnosti, spletne zdravstvene skupnosti, participacija v skupnosti

Abstract

Objective: *This paper investigates the collective psychological empowerment of users of online health communities, which has been often overlooked in literature. Drawing on the theories of empowerment in the context of community psychology, it explores the factors – that are also an important characteristic of online health communities – that are associated with the collective psychological empowerment of online health community users.*

Methods: *Four factors of collective empowerment were analysed and evaluated using multiple linear regression on the data collected at the end of 2010 through a web survey on a non-probability sample (n = 235) of active participants in the web forums on Med.over.net, the largest online health community in Slovenia. Among them 8.5% were male, 49.7% had some kind of university education and 41.5% were married respondents with a mean age of 35.1 years (SD = 9.1).*

[1]Univerza v Ljubljani, Fakulteta za družbene vede, Kardeljeva ploščad 5, 1000 Ljubljana, Slovenija
Kontaktni naslov: e-pošta: andraz.petrovcic@fdv.uni-lj.si

Results: *The study found that the theoretical model of factors adequately fits the data (F = 8.65, df = 8, p < 0.001), explaining 23.4% of the variability of collective empowerment. Sense of community (β = 0.279, p < 0.001), organisational involvement in community activities (0.194, 0.001), and perceived online health community participation in the wider environment (0.157, 0.02) contribute to the collective empowerment of users of the online health community Med.over.net. Conversely, the frequency of posting messages to online health forum discussions is not associated with collective empowerment (0.029, 0.65).*

Conclusion: *In order to improve the collective empowerment of users of online health communities, it is necessary first of all to build on the quality of relationships between its members, involve them in strategic decisions of the community and foster online health community involvement in the wider social environment, since the participation of users in online communities itself does not lead to a higher level of their collective empowerment.*

Key words: empowerment, sense of community, online health communities, community participation

1 UVOD

Svetovni splet postaja vse pomembnejše okolje za ljudi, ki so soočeni z zdravstvenimi težavami ali se zanimajo za zdravstvene informacije. V Sloveniji z leti narašča delež rednih internetnih uporabnikov, ki na spletu iščejo z zdravjem povezane informacije (1), pri čemer je lanskoletna slovenska populacijska anketna raziskava pokazala, da je skoraj 26 % anketirancev, ki so imeli v prejšnjem mesecu simptome, iskalo informacije na svetovnem spletu (2). V tem pogledu so pomembne tudi spletne zdravstvene skupnosti (SZS) kot prostori skupinskega komuniciranja (3), v katerih lahko pacienti ali potencialni pacienti zvedo nekaj o svoji bolezni in si z drugimi uporabniki izmenjujejo socialno oporo (4, 5). Ker so SZS pogosto prostor povezovanja posameznikov z občutki in/ali v stanju nemoči (6), jih vrsta avtorjev povezuje s pojmom psihološkega opolnomočenja (7, 8). V kontekstu zdravja se psihološko opolnomočenje povezuje zlasti s povečanim občutkom posameznikov, da so se sposobni učinkovito spoprijeti s svojim zdravstvenim stanjem, z boljšimi možnostmi dostopa do zdravstvenih informacij, ustreznejšim nadzorom nad svojimi odločitvami in s komuniciranjem z zdravstvenim osebjem (9–12). Ugotovljeno je bilo, da vključevanje posameznikov v SZS zanje prinaša pozitivne posledice v smislu individualnega psihološkega opolnomočenja, ki se kažejo kot lažje sprejemanje bolezni, povečanje optimizma in samozavesti pa tudi boljšega splošnega psihosocialnega počutja (9, 13–17), medtem ko je kolektivni vidik psihološkega opolnomočenja, ki se nanaša na subjektivno oceno možnosti sodelovanja uporabnikov SZS za doseganje pozitivnih učinkov na področju zdravja, sicer poudarjen kot pomemben (17), a hkrati dejansko neraziskan v kontekstu SZS.

1.1 Kolektivno psihološko opolnomočenje

Kolektivno opolnomočenje se nanaša na posameznikovo prepoznavanje in razumevanje družbenih razmerij, ki (so)oblikujejo socialne okoliščine in zavedanje o pomenu skupnih virov, potrebnih za družbene spremembe. Ker kolektivno opolnomočenje vključuje tudi posameznikovo znanje o delovanju skupnosti ter se izraža skozi nabor kognitivnih in interakcijskih kompetenc, ki mu omogočajo, da se (učinkovito) vključuje v delovanje skupnosti (18), ga je mogoče definirati kot dvorazsežen teoretski pojem (18, 19). Prva razsežnost se nanaša na posameznikovo kognitivno spoznanje, da je skupno delovanje, ki temelji na vzajemni opori in koordinaciji članov skupnosti, osnova za to, da lahko skupnost kot celota pridobi večjo moč in posledično lažje vpliva na družbene strukture, ki določajo pogoje prebivanja in delovanja članov skupnosti. Druga razsežnost poudarja interakcijski vidik oziroma pomen medosebnih odnosov med člani skupnosti. Gre za subjektivno zavest članov neke skupnosti, da lahko posamezniki vplivajo na določujoče družbene okoliščine (le) s krepitvijo njihovih medosebnih odnosov.

Za obe razsežnosti je bilo že nakazano, da imata psihološke, socialne in zdravstvene koristi za posameznike (14, 15, 20). Kolektivno opolnomočenje uporabnikov SZS lahko deluje kot vzvod njihovega povezovanja okrog skupnih ciljev, tako da se učinkovito poslužujejo svojih lastnih notranjih virov, pa tudi prek vplivanja na odločitve in aktivnosti zunanjih ustanov in organizacij (7, 21). SZS za uporabnike torej niso pomembne samo zaradi informacij, izmenjave različnih oblik opore in sodelovanja, ampak tudi za oblikovanje kolektivnega delovanja (17) in kolektivne zavesti (19), ki združuje člane skupnosti v prepričanju, da svoje (osebne) težave lahko uspešneje rešujejo skozi angažma v širših družbenih strukturah. Dobra ponazoritev posledic kolektivnega opolnomočenja uporabnikov SZS je primer novozelandske spletne skupnosti bolnic z rakom dojke, ki jim je s sodelovanjem znotraj njihove spletne skupnosti uspelo doseči, da je državna zdravstvena zavarovalnica krila dražje zdravljenje z učinkovitejšim zdravilom (22).

1.2 Dejavniki kolektivnega psihološkega opolnomočenja

V nasprotju s preučevanjem posledic individualnega psihološkega opolnomočenja uporabnikov SZS, ki so izpostavljene v omenjeni raziskavi (22) in drugih raziskavah (8, 12), so dejavniki kolektivnega opolnomočenja posameznikov v teh prostorih slabo raziskani. Kolektivno psihološko opolnomočenje ni niti trajna niti privzeta lastnost posameznikov, ampak je povezano s prisotnostjo osebnih in kontekstualnih dejavnikov (23), med katerimi se najpogosteje skupaj omenjajo občutek pripadnosti skupnosti, vključenost v organizacijske aktivnosti znotraj skupnosti in participacija skupnosti v širšem okolju (24). Občutek pripadnosti skupnosti sloni na poistovetenju posameznika s skupnostjo, občutku vplivnosti, integraciji s skupnostjo in na emocionalni povezanosti (25). Predstavlja ključni mehanizem za gradnjo in krepitev osebnih vezi ter razvoj zavedanja, da je njihova trdnost pomembna za krepitev družbene moči skupine (18, 24, 26). Podobno velja za vključenost v organizacijske aktivnosti znotraj skupnosti, ki se nanaša na vključevanje posameznikov v strateške razprave in odločitve glede razvoja skupnosti v odnosu do širšega družbena okolja. Delovanje članov skupnosti, ki imajo občutek sooblikovanja v skupnosti in s tem posredno nadzor nad njenim razvojem, pomembno prispeva k njihovemu poistovetenju s skupnostjo in njihovi zavezanosti h krepitvi skupnostnih struktur (24). Po drugi strani se participacija skupnosti v širšem okolju nanaša na vključenost in aktivnosti skupnosti v strukturah in razmerjih, ki so del širšega družbenega okolja. Participacija skupnosti vključuje aktivnosti njenih članov v različnih z zdravjem povezanih civilnodružbenih pobudah, humanitarnih dejavnostih in v prostovoljstvu (21, 22, 24, 26). Prek participacije članov skupnosti v širšem družbenem okolju namreč člani skupnosti ohranjajo nadvse pomemben stik s socialnim okoljem; s tem dodatno spoznavajo pomen vzajemnega sodelovanja in priložnosti, ki jim ga skupnost ponuja za njihovo psihološko opolnomočenje. Kot je bilo že nakazano, vloga omenjenih dejavnikov v kolektivnem psihološkem opolnomočenju uporabnikov SZS še ni bila raziskana. Obstajajo pa empirične raziskave, ki izpostavljajo pomen treh naštetih dejavnikov za različne vidike delovanja posameznikov v drugih oblikah spletnih skupnosti. Občutek pripadnosti skupnosti je ključen za oblikovanje načel recipročnosti in zaupanja med uporabniki spletnih skupnosti (27) ter za razvoj psihološkega opolnomočenja blogerjev (28). Nadalje vključenost članov spletne skupnosti v njene organizacijske aktivnosti krepi mehanizme socialne

kategorizacije in identifikacije s spletno skupnostjo, kar je lahko osnova posameznikovega zaznavanja možnosti, ki jih kolektivno delovanje nudi za vplivanje na socialne in širše družbene procese (29). Ne nazadnje je zaznava vključenosti spletne skupnosti v širše družbeno okolje kot oblika družbene participacije pomembna pri gradnji prepričanja članov spletne skupnosti, da ima lahko njeno delovanje pomembne učinke na pogoje posameznikovega življenja in delovanja (30).

Iz zgoraj zapisanega lahko oblikujemo tri hipoteze:

H_1: Občutek pripadnosti SZS je pozitivno povezan s kolektivnim opolnomočenjem uporabnikov SZS.

H_2: Vključenost v organizacijske aktivnosti znotraj SZS je pozitivno povezana s kolektivnim opolnomočenjem uporabnikov SZS.

H_3: Zaznava participacije SZS v širšem okolju je pozitivno povezana s kolektivnim opolnomočenjem uporabnikov SZS.

V raziskavi smo želeli nadalje preveriti, ali je s kolektivnim opolnomočenjem uporabnikov SZS povezana tudi njihova participacija v smislu intenzivnosti objavljanja sporočil v SZS. Neposredne teoretične zaslombe za tovrstno domnevo sicer v obstoječi literaturi nismo našli, a raziskave kažejo, da je intenzivnost objavljanja sporočil pomemben dejavnik individualnega opolnomočenja (13, 31). Uporabniki, ki pišejo, v primerjavi s tistimi, ki samo berejo sporočila v SZS, poročajo o višji stopnji samoučinkovitosti, boljši seznanjenosti o svojih zdravstvenih težavah in o večjem občutku nadzora nad svojo boleznijo (13). Predvidevamo pa lahko, da je objavljanje sporočil povezano tudi s kolektivnim opolnomočenjem. Intenzivnost objavljanja sporočil je namreč povezana z nudenjem pomoči drugim v SZS, ki je pomemben proces za razvoj posameznikovega občutka, da lahko s svojim aktivnim delovanjem v SZS pozitivno prispeva k njegovemu opolnomočenju (13). S pisanjem sporočil člani SZS lahko lažje osmislijo svoj osebni položaj in se učinkoviteje spopadejo z zdravstvenimi težavami (31). Obenem pa lahko z drugimi člani SZS iščejo nasvete za svoje konkretne zdravstvene težave, zato drugi člani v svojih odzivih v večji meri upoštevajo njihove specifične okoliščine in položaj (31). Ob intenzivnejši izmenjavi sporočil o lastnih težavah se tako lažje oblikuje spoznanje, da je za spreminjanje nekaterih strukturno povezanih osebnih težav potrebno kolektivno delovanje. Od tod sledi še četrta hipoteza:

H_4: Intenzivnost objavljanja sporočil v SZS je pozitivno povezana s kolektivnim opolnomočenjem uporabnikov SZS.

Namen raziskave je tako preučiti, kakšno je kolektivno opolnomočenje aktivnih uporabnikov SZS, kateri so ključni dejavniki kolektivnega opolnomočenja uporabnikov v tovrstnih skupnostih in kako je intenzivnost participiranja uporabnikov SZS povezana z njihovim kolektivnim opolnomočenjem.

2 METODA

2.1 Udeleženci in postopek

Podatki so bili zbrani s spletno anketo na neverjetnostnem vzorcu uporabnikov, ki so objavljali sporočila v forumih na spletnem mestu Med.over.net (http://med.over. net), tj. največji slovenski spletni zdravstveni skupnosti, ustanovljeni leta 2000 ter delujoči na področju izobraževanja, zdravstva in socialnega varstva. V letu 2011 je na mesečni ravni v povprečju beležila 432.000 obiskov, kar jo uvršča med najbolj obiskana spletna mesta v slovenskem prostoru (slika 1). Na Med.over.net

uporabniki lahko izbirajo med 241 forumi, razvrščenimi v 12 tematskih kategorij (npr. Zdravstvo, Starševstvo in odnosi, Zdravo življenje in alternativna, Sociala), v katerih je bilo od ustanovitve objavljenih več kot 8 milijonov sporočil, od tega 750.000 javno dostopnih odgovorov 186 strokovnjakov s področja zdravstva, sociale, psihologije in prava, ki svojimi strokovnimi nasveti poskušajo pomagati obiskovalcem spletnega foruma (32).

Vabilo in povezavo do spletnega vprašalnika so upravljavci spletne skupnosti Med.over.net objavili v vseh zdravstvenih forumih za čas treh tednov v novembru in decembru 2010, in sicer skladno s standardiziranimi metodološkimi koraki, ki jih za anketno raziskovanje uporabnikov spletnih skupnosti predlagajo Ip in drugi (33). Neverjetnostni vzorec 235 aktivnih uporabnikov spletnih forumov na Med.over. net sestavljajo anketiranci, ki so v celoti odgovorili na vprašalnik in ki so v zadnjem letu napisali vsaj eno sporočilo v teh forumih.
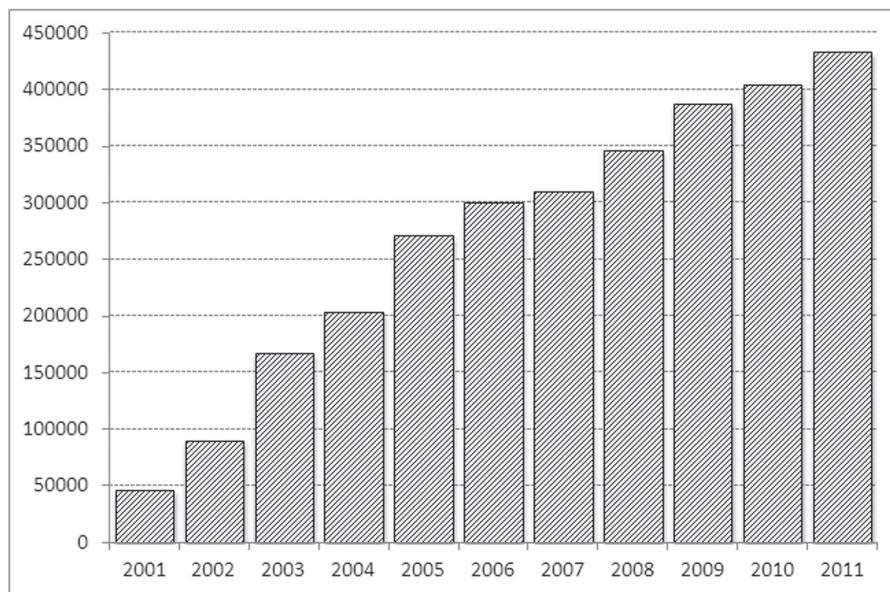
Slika 1.   *Povprečno število mesečnih obiskov spletnega mesta Med.over.net na letni ravni v obdobju 2001 do 2011 (32).*

Figure 1.   *Average number of monthly visits to the website Med.over.net on a yearly basis between 2001 and 2011 (32).*

2.2 Instrumenti

2.2.1 Odvisna spremenljivka

Kolektivno psihološko opolnomočenje je bilo merjeno s pomočjo lestvice interakcijskega opolnomočenja (18), ki na operacionalni ravni obsega dve razsežnosti. Prvo predstavlja lestvica »kolektivnega delovanja«, ki

je bila sestavljena iz petih trditev (npr. »Člani foruma lahko samo z medsebojnim sodelovanjem vplivamo na dogodke v širši družbi.«), drugo pa lestvica »medosebnih odnosov«, ki je sestavljena iz treh trditev (npr. »Prek pogovorov v forumu bi lahko dosegli, da se začne o nekaterih temah razpravljati tudi v širši javnosti.«). Oba sklopa trditev so anketiranci ocenjevali na petstopenjski

lestvici, na kateri je 1 pomenilo »sploh se ne strinjam«, 5 pa »popolnoma se strinjam.« Konfirmatorna faktorska analiza drugega reda je pokazala, da je mogoče obe razsežnosti kolektivnega opolnomočenja obravnavati v enorazsežnostni lestvici, saj se je faktorski model sorazmerno dobro prilegal podatkom (RMSEA = 0,057, RMR = 0,045, AGFI = 0,93), kar potrjuje tudi vrednost Cronbach α = 0,66.

2.2.2 Neodvisne spremenljivke

V raziskavi so bili z anketnim vprašalnikom merjeni štirje dejavniki kolektivnega psihološkega opolnomočenja. *Zaznana participacija spletne skupnosti*, ki so jo razvili Peterson in drugi (26), se nanaša na zaznavo članov o sodelovanju skupnosti v širšem družbenem okolju. Indeks predstavlja seštevek štirih trditev (npr. »Zbiralo se je denar za podporo neki akciji.«), na katere so anketiranci odgovorili z »da« ali »ne« oziroma »ne vem«, pri čemer je bil prvi odgovor v analizah kodiran z 1, preostala dva pa z 0. *Vključenost v organizacijske aktivnosti spletne skupnosti* je bila merjena s štirimi trditvami, ki so se nanašale na sodelovanje članov v dejavnostih znotraj spletnih skupnosti, kot je oblikovanje pobud ali razpravljanje o viziji in prihodnosti spletne skupnosti. Anketiranci so svojo aktivnost lahko ocenili na tristopenjski lestvici (1 = ne, nikoli, 2 = da, enkrat, 3 = da, večkrat), pri čemer so se njihovi odgovori po posameznih trditvah sešteli v indeks. Občutek pripadnosti spletni skupnosti je merjen z večkrat testirano lestvico občutka pripadnosti virtualni skupnosti (34). Lestvico sestavlja 12 postavk (npr. »V forumu se počutim domače.«), ki so jih anketiranci ocenjevali s pomočjo odgovorov 1 = drži ali 0 = ne drži. Vrednosti odgovorov po posameznih postavkah so bile seštete v indeks, za katerega lahko trdimo, da je zanesljiv (Cronbach α = 0,76). Intenzivnost objavljanja sporočil je bila merjena z vprašanjem *Kako pogosto ste v povprečju pisali sporočila v forum na Med.over.net v zadnjih 3 mesecih?,* pri čemer so anketiranci svojo aktivnost lahko ocenili na lestvici od 1 = nikoli do 5 = vsak dan ali skoraj vsak dan.

2.2.3 Kontrolne spremenljivke

Pretekle raziskave o spletnih podpornih skupinah in zdravstvenih skupnostih so pokazale, da obstajajo nekatere pomembne razlike med člani glede na njihove sociodemografske lastnosti. Coulson in Malik (9) na osnovi pregleda večjega števila raziskav navajata, da SZS uporabljajo predvsem ženske, osebe srednjih let, osebe z višjim dohodkom in višjo izobrazbo. Posledično so bile v tukajšnjo analizo vključene tudi naslednje kontrolne spremenljivke: spol, starost in izobrazba anketirancev. Hkrati je bila opravljena tudi kontrola glede na obdobje aktivnosti anketirancev v spletni skupnosti Med.over.net v smislu trajanja njihovega članstva, saj se je to izkazalo kot pomembno v odnosu do občutka pripadnosti in aktivnega sodelovanja v organizacijskih aktivnosti v spletni skupnosti (35).

2.3 Statistične analize

Sestava vzorca anketirancev je bila zaradi nominalne merske lestvice spremenljivk analizirana s strukturnimi odstotki. Za preučevanje povezanosti štirih pojasnjevalnih spremenljivk s kolektivnim opolnomočenjem smo za bivariatno analizo najprej izračunali Pearsonove koeficiente korelacije, nato pa uporabili multiplo linearno regresijo, pri čemer so bili parametri regresijske funkcije ocenjeni z metodo najmanjših kvadratov. Da smo zadovoljili predpostavkam te metode, smo zaradi precejšnje asimetrije dihotomizirali (vrednosti, ki so enake ali večje od 1, so bile združene v vrednost 1) spremenljivki *vključenost v organizacijske aktivnosti* in *zaznana participacija skupnosti*, medtem ko smo prav tako asimetrično porazdeljeno dolžino članstva v spletni skupnosti logaritmirali. Faktorji napihnjenosti variance (VIF) so vsi blizu vrednosti 1 in kažejo, da problem multikolinearnosti v regresijskem modelu ni bil prisoten.

3 REZULTATI

Iz Tabele 1 lahko razberemo, da je bilo v analiziranem vzorcu aktivnih uporabnikov foruma na spletnem mestu Med.over.net vključenih 8,5% moških, pri čemer je bila povprečna starost anketirancev 35,1 leta (SD = 9,1). V vzorcu je bila skoraj polovica (49,7%) anketiranih vsaj visoko izobraženih, dobri dve petini (41,5%) vzorca pa so predstavljali poročeni anketiranci. Med njimi jih 9,8% objavlja sporočila na dnevni ravni, 38,7% jih je registriranih v to spletno skupnost že 3 leta ali več, 54,9% pa jih Med.over.net obiskuje dnevno.

Tabela 1. *Sociodemografske lastnosti vzorca anketiranih in izbrani vidiki njihove aktivnosti na Med.over.net.*
Table 1. *Sociodemographic characteristics of the respondents and selected aspects of their activity on Med.over.net.*

Spremenljivka / Variable	Kategorija / Category	N	%
Spol / Gender	Ženski / Female	215	91,5
	Moški /Male	20	8,5
Starost / Age	do 24 / up to 24	16	6,8
	25–30	43	18,3
	31–36	76	32,3
	37–46	75	31,9
	47 in več / 47 and above	25	10,6
Izobrazba / Education	Srednja strokovna ali manj / Secondary school or less	52	22,2
	Višješolska ali srednja splošna / High school or college	66	28,1
	Visokošolska ali več / University or more	117	49,7
Zakonski status / Marital status	Poročen / Married	97	41,5
	Izvenzakonska skupnost / Non-marital partnership	92	39,1
	Samski, ostalo / Single, other	46	19,4
Dolžina članstva / Length of membership	1 leto ali manj / 1 year or less	73	31,1
	1–2 leti / 1-2 years	34	14,5
	2–3 leta / 2-3 years	37	15,7
	3 leta ali več / 3 years or more	91	38,7
Pogostost obiskovanja / Frequency of visit	Letno / Yearly	14	6,1
	Mesečno / Monthly	25	10,7
	Tedensko / Weakly	66	28,3
	Dnevno / Daily	128	54,9
Pogostost pisanja sporočil / Frequency of posting	Nikoli v zadnjih 3 mesecih / Never in the last 3 months	5	2,1
	Manj kot mesečno / Less than monthly	82	34,9
	Mesečno / Monthly	68	28,9
	Tedensko / Weakly	57	24,3
	Dnevno / Daily	23	9,8
Skupaj / Total		235	100

V Tabeli 2 so predstavljeni korelacijski koeficienti in opisne statistike odvisne spremenljivke in neodvisnih spremenljivk. Med anketiranci spletne skupnosti Med. over.net je v srednji meri razvit občutek kolektivnega opolnomočenja (2,95 ± 0,67) in tudi občutek pripadnosti spletni skupnosti (6,02 ± 2,60), medtem ko sta vključenost v organizacijske strukture spletne skupnosti (1,15 ± 0,39) in zaznava širšega družbenega delovanja spletne skupnosti (0,54 ± 0,88) pričakovano nizki.

Kolektivno opolnomočenje od šibko do srednje močno značilno pozitivno korelira z vsemi neodvisnimi spremenljivkami, pri čemer najmočneje z občutkom pripadnosti spletni skupnosti ($r = 0,354$, *p < 0,001*), nato z zaznano participacijo skupnosti ($r = 0,334$, *p < 0,001*) in vključenostjo v organizacijske aktivnosti ($r = 0,322$, *p < 0,001*), najšibkeje pa z intenzivnostjo pisanja sporočil ($r = 0,19$, *p = 0,01*).

Tabela 2. *Korelacijski koeficienti, aritmetične sredine ter standardni odkloni odvisne spremenljivke in neodvisnih spremenljivk.*

Table 2. *Correlation coefficients, means and standard deviations of dependent and independent variables.*

Spremenljivka / Variable	[1]	[2]	[3]	[4]	[5]	M	SD	Min	Max
Kolektivno opolnomočenje / Collective empowerment [1]	1					2,95	0,67	1	5
Občutek pripadnosti spletni skupnosti / Sense of community [2]	0,354***	1				6,02	2,60	0	12
Vključenost v organizacijske aktivnosti / Community organization [3]	0,322***	0,240***	1			1,15	0,39	1	3
Zaznana participacija skupnosti / Community participation [4]	0,334***	0,209**	0,391***	1		0,54	0,88	0	4
Intenzivnost pisanja sporočil / Frequency of positing [5]	0,189**	0,171**	0,323***	0,267***	1	3,05	1,03	1	5

Opomba / Note: n = 235; * $0,05 < p < 0,1$, ** $0,01 < p < 0,05$, *** $p < 0,01$.

Linearni regresijski model se statistično značilno prilega podatkom (F = 8,65, *df=8,p < 0,001*) in z njim lahko pojasnimo 23,4% variabilnosti občutka kolektivnega opolnomočenja. Standardizirani regresijski koeficienti v tabeli 3 kažejo, da je občutek pripadnosti spletni skupnosti srednje močno (β = 0,279, *p < 0,001*), povezan s kolektivnim opolnomočenjem. Bolj kot je posameznik poistoveten s skupnostjo, vključen vanjo in čustveno povezan z drugimi člani, bolj se prek vzpostavljanja medosebnih odnosov in oblik sodelovanja pri uporabnikih SZS zvišuje občutek kolektivnega opolnomočenja. Hkrati zavedanje delovanja spletne skupnosti v širšem družbenem okolju viša občutek kolektivnega opolnomočenja (β = 0,194, *p < 0,001*). Prav tako je s kolektivnim opolnomočenjem statistično značilno povezana vključenost v skupnostno organizacijo (β = 0,157, *p = 0,02*). Posamezniki, ki niso le uporabniki SZS, ampak aktivno sodelujejo pri oblikovanju njenih politik in aktivnosti, bodo verjetneje razvili višji občutek kolektivnega opolnomočenja. Po drugi strani intenzivnost sodelovanja v razpravah v SZS ni statistično značilno povezana s kolektivnim opolnomočenjem (β = 0,029, *p = 0,65*). Pogostost zastavljanja vprašanj, iskanja odgovorov in pogovarjanja z drugimi torej ne vpliva na posameznikov občutek, da se lahko z delovanjem v SZS organizira aktivnosti, ki imajo potencialne učinke na družbene strukture in posledično uporabnike spletne skupnosti. Nobena izmed kontrolnih spremenljivk se ni izkazala za statistično značilno povezano s kolektivnim opolnomočenjem.

Tabela 3. Multipla regresijska analiza za kolektivno opolnomočenje.
Table 3. Multiple regression analysis for collective empowerment.

Spremenljivka / Variable	b	SE	β	95% CI(β)	
				Min	Max
Občutek pripadnosti spletni skupnosti / Sense of community	0,072	0,016	0,279***	0,247	0,311
Vključenost v organizacijske aktivnosti / Community organization	0,068	0,029	0,157**	0,100	0,214
Zaznana participacija skupnosti / Community participation	0,147	0,050	0,194***	0,095	0,293
Intenzivnost pisanja sporočil / Frequency of posting	0,019	0,042	0,029	-0,054	0,112
Dolžina članstva (log) / Length of membership (log)	0,049	0,033	0,092	0,027	0,157
Spol (moški=0) / Gender(male=0)	-0,114	0,145	-0,047	-0,333	0,239
Starost / Age	0,001	0,005	0,007	-0,003	0,017
Izobrazba / Education	0,016	0,021	0,044	0,003	0,085

Opomba / Note: n = 235; F = 8,65*** df = 8, R^2 (adj.) = 0,234, * 0,05 < p < 0,1, ** 0,01 < p < 0,05, *** p < 0,01.

4 RAZPRAVA

V raziskavi smo analizirali štiri iz relevantne literature izpeljane dejavnike kolektivnega psihološkega opolnomočenja uporabnikov SZS. Izsledki so pokazali, da je kolektivno opolnomočenje v srednji meri prisotno med uporabniki analizirane SZS, pri čemer smo skladno s teoretskimi izhodišči potrdili tri hipoteze, eno pa zavrnili. Kolektivno opolnomočenje med aktivnimi uporabniki spletnih forumov na Med.over.net je srednje močno povezano z njihovim občutkom pripadnosti spletni skupnosti. To potrjuje trditev, da je med aktivnimi člani SZS občutek pripadnosti pomembno sidrišče za vzpostavljanje osebnih vezi, iz katerih se lahko oblikujejo specifične pobude in skupine za zaščito različnih skupin pacientov (22, 36). Podobno velja tudi za vključenost članov v organizacijske aktivnosti znotraj skupnosti in zaznano participacijo skupnosti. Med uporabniki SZS ne gre samo za izmenjavo opore med posamezniki, ki se spopadajo z zdravstvenimi težavami ali pa se z njimi spopada kdo izmed njihovih bližnjih, ampak ti uporabniki v SZS vidijo tudi priložnosti organizacije aktivnosti (npr. pobud in akcij), ki naslavljajo njihove skupne potrebe in želje glede izboljševanja njihovega zdravstvenega stanja ali stanja njihovih bližnjih (15, 22). Na Med.over. netu je to že opazno pri (samo)organizaciji aktivnosti

uporabnikov s težavami z neplodnostjo in s ščitnico (32), ki niso usmerjene samo v pripravo srečanj skupin za samopomoč, ampak tudi v izoblikovanje formalnih pobud za izboljšanje položaja teh skupin pacientov v javnem zdravstvu. V tem kontekstu se je v raziskavi zlasti zaznava aktivnih uporabnikov, da povezovanje in sodelovanje skupnosti s širšim okoljem vodita do učinkovitejših rešitev, izkazala kot pomembna za to, da so sposobni prepoznati SZS kot aktiven subjekt v odnosu do drugih zdravstvenih struktur, kar velja za eno izmed načel opolnomočenja pacientov v zdravstvu (12). Pomen participacije skupnosti v zdravstvu je bil v preteklosti že večkrat izpostavljen v t.i. »participativnem skupnostnem modelu komuniciranja v zdravstvu« (37), ki trdi, da participacija skupnosti opolnomoči njene člane, tako da lahko jasneje izražajo svoje potrebe, lažje določijo razpoložljive vire in jih skupaj tudi mobilizirajo s ciljem doseči pozitivne zdravstvene učinke za skupnost kot celoto. Ti izsledki morda ponujajo izhodišče za razmislek o tem, kako v te modele komuniciranja vključiti SZS, ki zaradi svoje neodvisnosti od časovnih in zemljepisnih okvirov lahko celo dodatno – kot je bilo v preteklosti že pokazano (22) – prispevajo k učinkovitejšemu uresničevanju pobud in prizadevanj združenj bolnikov (3, 6, 9). Ob tem se je treba zavedati vsaj dveh vidikov, ki lahko omejujejo participativni

potencial SZS. Prvi se nanaša na vprašanje digitalne izključenosti, ki je povezano z dostopom do svetovnega spleta in informacijskih veščin, ki so potrebne za uporabo SZS (38). Raziskave namreč kažejo, da je (tudi v Sloveniji) med najbolj socialno izključenimi skupinami prebivalcev običajno tudi največji delež digitalno izključenih (39). Drugi vidik pa se nanaša na delež internetnih uporabnikov, ki aktivno participacijo v SZS: domače (40) in tuje raziskave (4) namreč poročajo, da je kljub razširjenosti SZS delež internetnih uporabnikov, ki v njih aktivno sodelujejo, sorazmerno majhen v primerjavi z deležem uporabnikov, ki SZS sicer obiskuje, a v njih aktivno ne sodeluje.

V povezavi z aktivnostjo uporabnikov SZS se intenzivnost objavljanja sporočil ni izkazala za značilno povezano z njihovim kolektivnim opolnomočenjem. Izsledki tako niso potrdili nekaterih predhodnih raziskav (9, 13, 41), saj pogostejše objavljanje sporočil med uporabniki SZS ne povečuje občutka, da bi z medsebojnim sodelovanjem lahko vplivali na razmerja v širši družbi, ki so povezana z njihovimi zdravstvenimi težavami. Ob tem velja upoštevati, da so bile omenjene raziskave omejene na individualno opolnomočenje. Gre za pomembno razliko, zlasti v luči nedavnih dognanj, da ima pogostost objavljanja sporočil v SZS različne sociopsihološke posledice, če je vezano na prejemanje ali dajanje socialne opore (42). Dajanje socialne opore namreč neposredno ne krepi občutka pripadnosti skupnosti, ampak postane njegov pomemben dejavnik šele takrat, ko je ob dajanju hkrati prisotno tudi prejemanje opore. S tem je mogoče vsaj posredno pojasniti odsotnost povezave med kolektivnim opolnomočenjem in intenzivnostjo objavljanja sporočil: če to ni vezano na vzajemno izmenjavo opore med člani, se pri njih ne pojavi občutek pripadnosti, s čimer pa se tudi zmanjša verjetnost, da bodo člani skupnost kot celoto prepoznali za akterja v procesu opolnomočenja. Zdi se, da je za kolektivno psihološko opolnomočenje uporabnikov SZS zelo pomembna vsebina v njih objavljenih sporočil. V prihodnje bi zato veljalo več pozornosti nameniti raziskovanju, ki bo intenzivnost objavljanja sporočil preučevalo z vidika (vzajemnosti) izmenjave socialne opore in drugih značilnosti z zdravjem povezanega podpornega komuniciranja.

Skladno s preteklimi raziskavami o individualnem opolnomočenju uporabnikov SZS (43) se je tudi v tukajšnji raziskavi pokazalo, da demografske značilnosti uporabnikov SZS niso povezane s kolektivnim opolnomočenjem, kar sicer potrjuje izhodišča nekaterih teorij računalniško posredovanega komuniciranja, ki posebej izpostavljajo nizek pomen »offline« sociodemografskih lastnosti ljudi za njihovo delovanje

v družbenih prostorih na spletu, kamor spada tudi SZS (44). Vseeno pa struktura vzorca nakazuje in potrjuje reprezentativne podatke iz domače (40) in tuje literature (4, 45), da tudi v Sloveniji SZS v večji meri aktivno uporabljajo ženske in osebe srednjih let z višjo izobrazbo. Visoko zastopanost žensk v tukajšnjem vzorcu (največje odstopanje od reprezentativnih podatkov) je mogoče deloma pojasniti z večjo obiskanostjo forumov na Med.over.netu, ki so vezani na posvetovalnice o družinski medicini in porodništvu, starševstvu in medosebnih odnosih ter o sociali (32) pa tudi z na splošno bolj središčno vlogo žensk pri izmenjavi socialne opore, ki vključuje z zdravjem povezano podporno komuniciranje (46).

Demografska struktura vzorca je zelo verjetno tudi posledica uporabe neverjetnostnega vzorca aktivnih uporabnikov forumov na Med.over.netu, ki je lahko podvržen problemu pristranskosti zaradi samoizbire anketirancev – gre za splošno omejitev neverjetnostih spletnih anket, pri katerih ni mogoče oceniti napake zaradi neodgovorov in nepokritja (47) –, zato izsledkov analiz ni mogoče posplošiti niti za omenjeno spletno mesto niti za splošno populacijo uporabnikov slovenskih SZS. Kljub temu predvidevamo, da rezultati te raziskave dajejo osnovo za prihodnje raziskovanje dejavnikov kolektivnega opolnomočenja uporabnikov SZS, saj sorazmerno visoke jakosti povezav v regresijskem modelu nakazujejo visoko interno veljavnost rezultatov. Ob tem je seveda treba upoštevati dejstvo, da Med. over.net povezuje veliko forumov, ki jih uporabljajo ljudje z najrazličnejšimi zdravstvenimi in s socialnimi težavami. Ker med njimi pričakujemo razlike v motivih, načinih in v sociopsiholoških posledicah uporabe SZS (9, 42), bi bilo v prihodnje smiselno v analize vključiti tudi primerjavo psihološkega opolnomočenja med posamezniki glede na naravo njihovih zdravstvenih težav (17). Nadalje je treba upoštevati, da je Med. over.net ena redkih SZS v slovenskem prostoru z desetletno tradicijo, velikim številom uporabnikov, s skrbnim upravljanjem ter z izoblikovano strukturo norm in pravil – predvsem zadnje je verjetno nujni strukturni pogoj, da se procesi kolektivnega opolnomočenja sploh odvijajo. S tem želimo opozoriti, da ni vsaka SZS nujno koristna za uporabnika, ampak lahko v določenih primerih tudi povzroča težave (npr. izpostavljenost uporabnikov nestrokovnim nasvetom, ki imajo za posledico opustitev ustrezne medicinske oskrbe). Ne nazadnje velja kot omejitvi omeniti tudi sorazmerno nizko zanesljivost lestvic kolektivnega opolnomočenja in občutka pripadnosti spletni skupnosti, ki bi jih veljalo v prihodnosti še bolj prilagoditi specifičnemu kontekstu SZS, ter oteženo primerjalno validacijo izsledkov

tukajšnje raziskave, saj v obstoječi literaturi nismo zasledili podobnih raziskav.

5 ZAKLJUČEK

SZS je pomemben prostor, v katerem se lahko odvijajo družbeni procesi, ki posameznikom, ki so zaradi različnih razlogov in na različne načine soočeni z zdravstvenimi težavami, omogočajo, da postanejo psihološko opolnomočeni. V času, ko sodobna družba terja od posameznikov vse več vsakdanjih individualnih naporov pri premagovanju teh težav (48), ta raziskava kaže, da je med uporabniki SZS prisoten tudi kolektivni vidik psihološkega opolnomočenja, ki pa ni odvisen od intenzivnosti njihove participacije v SZS, ampak je povezan z njihovim občutkom pripadnosti SZS, njihovo aktivno vključenostjo v organizacijske aktivnosti znotraj SZS in z njihovo stopnjo angažmaja v participaciji skupnosti znotraj zdravstvenih struktur. V tem pogledu ta raziskava poudarja tri dejavnike, ki so tesno povezani z delovanjem celotne spletne skupnosti in ki bi bili v prihodnosti lahko osnova za povečevanje kolektivnega opolnomočenja uporabnikov SZS ter na splošno njihove vloge v javnem zdravstvu. Ta bi lahko postala še pomembnejša z aktivnim vključevanjem širših skupin internetnih uporabnikov pa tudi neuporabnikov, ki danes (še) niso na aktiven način vključeni v SZS.

Zahvala

Literatura

1. Uporaba informacijsko - komunikacijske tehnologije v gospodinjstvih in pri posameznikih Slovenija: končni podatki. Ljubljana: Statistični urad Republike Slovenije, 2012. Pridobljeno 5. 12. 2012 s spletne strani: http://www.stat.si/.
2. Klemenc-Ketiš Z, Kersnik J. Seeking health advice on the Internet in patients with health problems: a cross-sectional population study in Slovenia. Inform Health Soc Care 2013; 3: 280-90.
3. Demiris G. The diffusion of virtual communities in health care: concepts and challenges. Patient Educ Couns 2006; 62: 178-88.
4. Fox S. Medicine 2.0: peer-to-peer healthcare: report. Washington, DC: Pew Internet & American Life Research Center, 2011.
5. Preece J. Empathic communities: reaching out across the web. Interactions 1998; 2: 32-43.
6. Tanis M. Online social support groups. In Joinson A, McKenna KYA, Postmes T, Reips UD, editors. Oxford handbook of internet psychology. Oxford: Oxford University Press, 2007: 137-52.
7. Barak A, Boniel-Nissim M, Suler J. Fostering empowerment in online support groups. Comput Hum Behav 2008; 24: 1867-83.
8. Santana S, Lausen B, Bujnowska-Fedak M, Chronaki CE, Prokosch H-U, Wynn R. Informed citizen and empowered citizen in health: results from an European survey. BMC Fam Pract 2011; 12: 20-35.
9. Coulson NS, Malik S. Health-related online support communities. In: Yan Z, editor. Encyclopedia of cyber-behaviour. Hershey, PA: IGI Global, 2012: 671-88.
10. Bartlett K, Coulson NS. An investigation into the empowerment effects of using online support groups and how this affects doctor/patient communication. Patient Educ Couns 2011; 83: 113-9.
11. Seckin G. Informational and decisional empowerment in online health support communities: initial psychometric validation of the Cyber Info-Decisional Empowerment Scale (CIDES) and preliminary data from administration of the scale. Support Care Cancer 2011; 19: 2057-61.
12. Bridges J, Loukanova S, Carrera P. Patient empowerment in health care. In: Heggenhougen K, Quah S, editors. International encyclopedia of public health, Vol. 5. San Diego: Academic Press, 2008: 17-28.
13. van Uden-Kraan CF, Drossaert CHC, Taal E, Seydel ER, van de Laar MAJF. Self-reported differences in empowerment between lurkers and posters in online patient support groups. J Med Internet Res 2008; 10: e18. doi:10.2196/jmir.992.
14. Lemire M, Sicotte C, Paré G. Internet use and the logics of personal empowerment in health. Health Policy 2008; 88: 130-40.
15. Menon ST. Toward a model of psychological health empowerment: implications for health care in multicultural communities. Nurse Educ Today 2002; 22: 28-39.
16. Sharf BF. Communicating breast cancer on-line: support and empowerment on the internet. Women Health 1997; 26: 65–84.
17. van Uden-Kraan CF, Drossaert CHC, Taal E, Shaw BR, Seydel ER, van de Laar MAJF. Empowering processes and outcomes of participation in online support groups for patients with breast cancer, arthritis, or fibromyalgia. Qual Health Res 2008; 18: 405–17.
18. Speer PW. Intrapersonal and interactional empowerment: implication for theory. J Community Psychol 2000; 28: 51-61.
19. Zimmerman MA. Psychological empowerment: issues and illustrations. Am J Community Psychol 1995; 23: 581–99.
20. Speer PW, Hughey J. Community organizing: an ecological route to empowerment and power. Am J Community Psychol 1995; 23: 729-48.
21. Boehm A, Staples LH. Empowerment: the point of view of consumers. Fam Soc 2004; 85: 270-80.
22. Radin P. "To me, it's my life": medical communication, trust, and activism in cyberspace. Soc Sci Med 2006; 62: 591-601.
23. Mlinar S. Perceptions of empowerment among part-time nursing students. Zdrav Var 2012; 51: 69-74.
24. Hur MH. Empowerment in terms of theoretical perspectives: exploring a typology of the process and components across disciplines. J Community Psychol 2006; 34: 523-40.
25. McMillan DW, Chavis DM. Sense of community: a definition and theory. J Community Psychol 1986; 14: 6–23.
26. Peterson NA, Lowe JB, Aquilino ML, Schnider JE. Linking social cohesion and interactional empowerment: support and new implications for theory. J Community Psychol 2005; 33: 233–44.
27. Blanchard AL, Welbourne JA, Boughton MA. A model of online trust: the mediating role of norms and sense of virtual community. Inform Commun Society 2011; 14: 76-106.

28. Stavrositu C, Sundar SS. Does blogging empower women? Exploring the role of agency and community. J Comput Mediat Comm 2012; 17: 369-86.
29. Michinov N, Michinov E, Toczek-Capelle MC. Social identity, group processes, and performance in synchronous computer-mediated communication. Group Dynamics: Theory, Research and Practice, 2004; 8: 27-39.
30. Matzat U. A theory of relational signals in online groups. New Media Soc 2009; 11: 375-94.
31. Tanis M. Health-related online forums: what's the big attraction. J Health Commun 2008; 13: 698-714.
32. Verovšek A, Cimerman P. Predstavitev Med.over.net na prireditvi ob 10. letnici delovanja portala na Med.Over.Net. Ljubljana, 2010.
33. Ip EJ, Barnett MJ, Tenerowicz MJ, Perry PJ. The touro 12-step: a systematic guide to optimizing survey research with online discussion boards. J Med Internet Res 2010; 12: e16.
34. Blanchard AL. Testing a model of sense of virtual community. Comput Hum Behav 2008; 24: 2107-23.
35. Kraut RE, Resnick P, Kiesler S, Ren Y, Chen Y, Burke M et al. Building successful online communities: evidence-based social design. Cambridge, MA: The MIT Press, 2012.
36. Obst PL, Stafurik J. Online we are all able bodied: online psychological sense of community and social support found through membership of disability-specific websites promotes well-being for people living with a physical disability. J Community Appl Soc 2010; 20: 525-31.
37. Basu A, Dutta MJ. The relationships between health information seeking and community participation: the roles of health information orientation and efficacy. Health Commun 2008; 23: 70-9.
38. Vehovar V, Sicherl P, Hüsing T, Dolničar V. Methodological challenges of digital divide measurements. Inf Soc; 2006: 279-90.
39. Dolničar V. Merjenje dinamike digitalnega razkoraka. Ljubljana: Fakulteta za družbene vede, 2008.
40. Vehovar V, Travar J. RIS 2008: e-Zdravje in e- Farmacija (#84). Ljubljana: Fakulteta za družbene vede, 2009.
41. Mo PKH, Coulson NS. Developing a model for online support group use, empowering processes and psychosocial outcomes for individuals living with HIV/AIDS. Psychol Health 2012; 27: 445-59.
42. Welbourne JL, Blanchard AL, Wadsworth MB. Motivations in virtual health communities and their relationship to community, connectedness and stress. Comput Hum Behav 2013; 29: 129–39.
43. van Uden-Kraan CF, Drossaert CHC, Taal E, Seydel ER, van de Laar MAFJ. Participation in online patient support groups endorses patients' empowerment. Patient Educ Couns 2009; 74: 61-9
44. Walther JB. Interpersonal effects in computer-mediated interaction: a relational perspective. Commun Res 1992; 19: 52–90.
45. Fox S, Duggan M. Health online 2013: report. Washington, DC: Pew Internet & American Life Research Center, 2013.
46. Černigoj Sadar N. Delovanje neformalnih socialnih omrežij pri zadovoljevanju potreb družin. In: Novak M, Černigoj Sadar N, Dragoš S, Ferligoj A, Hlebec V, Kogovšek T, Nagode M, editors. Omrežja socialne opore Slovencev, Ljubljana: Inštitut Republike Slovenije za socialno varstvo, 2004: 133-42.
47. Lozar Manfreda K, Bosnjak M, Berzelak J, Haas I, Vehovar V. Web surveys versus other survey modes: a meta-analysis comparing response rates. Int J Market Res 2008; 50: 79-104.
48. Ule M, Kamin T. Družbeni dejavniki neenakosti v zdravju. Zdrav Var 2012; 51: 1-4.

RISK FACTORS AS A RESULT OF UNHEALTHY NUTRITION IN THE ADULT POPULATION IN SLOVENIA WITH REGARD TO SOCIODEMOGRAPHIC VARIABLES

DEJAVNIKI TVEGANJA NEZDRAVEGA NAČINA PREHRANJEVANJA ODRASLIH PREBIVALCEV SLOVENIJE GLEDE NA SOCIODEMOGRAFSKE SPREMENLJIVKE

Verena Koch[1], Mojca Gabrijelčič Blenkuš[2], Matej Gregorič[2], Stojan Kostanjevec[1]

Abstract

Introduction: *In this research, we carried out an analysis of risk factors due to precarious nutrition among the adult population in Slovenia and correlated the risks with biological and sociodemographic variables.*

Methods: *Descriptive and quantitative methods were applied. The data were collected by a structured interview on a sample of 1,193 adults from Slovenia. The biological and sociodemographic variables were then correlated with particular risk factors. The data was analysed using a statistical analysis program SPSS.*

Results: *It was found that only 4.7% of the population practice healthy nutritional diets, 22.5% can be considered as acceptable and 62.8% of the diets were classified as unhealthy. The most frequent risk factor is due to insufficient intake of grains, fish and vegetables as well as too much fried food and beverages with added sugar and red meat. In finding the correlations between biological and sociodemographic variables and risk factors, we found some correlations. The results also show that unhealthy nutrition is more frequent among the population with below average material standards and lower educational levels, people living in smaller communities, the young, people with high BMI, those living in eastern regions of Slovenia and students.*

Conclusion: *The results indicate that more effort should be made to target activities towards those groups where several risk factors were found and develop a complex approach to developing healthy nutritional life styles.*

Key words: nutrition, nutritional habits, risk factors, adults, Slovenia

Izvleček

Uvod: *Opravljena je bila analiza pojavljanja dejavnikov tveganja nezdravega načina prehranjevanja med odraslimi prebivalci Slovenije glede na biološke in sociodemografske spremenljivke.*

Metode: *Raziskovalna metoda je deskriptivna in kvantitativna. Podatki so bili zbrani strukturirano, z osebnim anketiranjem na terenu. Vzorec je zajemal 1.193 odraslih prebivalcev Slovenije. Spremljane biološke in sociodemografske spremenljivke smo povezovali z izbranimi dejavniki modela zdravega prehranjevanja. Izsledke smo ovrednotili s statistično analizo s pomočjo računalniškega programa SPSS.*

Rezultati: *Ugotovili smo, da ima le 4,7 % anketiranih zdrave prehranjevalne navade, še ustrezno prehranjevanje ima 22,5 % anketiranih, pri 62,8 % anketiranih pa prehranjevanje označujemo kot nezdravo. Najpogosteje anketirani uživajo premalo žit in žitnih izdelkov ter rib, premalo zelenjave, preveč ocvrte hrane, pijač z dodanim sladkorjem in rdečega mesa. Ugotovili smo povezanost bioloških in sociodemografskih spremenljivk z nekaterimi dejavniki tveganja. Izsledki raziskave tudi kažejo, da je nezdravo prehranjevanje pogosteje prisotno med prebivalci s podpovprečnim gmotnim standardom, z osnovnošolsko izobrazbo, pri prebivalcih manjših krajev, mladih, ljudeh z visokim ITM, v vzhodnoslovenski regiji in pri tistih, ki imajo status študenta.*

[1]University of Ljubljana, Faculty of Education, Kardeljeva ploščad 16, 1000 Ljubljana, Slovenia
[2]Institute of Public Health of the Republic of Slovenia, Trubarjeva 2, 1000 Ljubljana, Slovenia
Correspondence to: e-mail: verena.koch@pef.uni-lj.si

Zaključek: Glede na izsledke ocenjujemo, da je treba več aktivnosti ciljno usmeriti v skupine, ki so bolj obremenjene z dejavniki tveganja, oblikovati več ciljno usmerjenih implementacijskih aktivnosti in poudariti celosten pristop k zagotavljanju zdravega življenjskega sloga, katerega pomemben del so prehranjevalne navade.

Ključne besede: prehrana, prehranske navade, dejavniki tveganja, odrasli, Slovenija

1   INTRODUCTION

Various unhealthy habits are linked to the risk of disease. Smoking, alcohol consumption, leading a physically inactive lifestyle and unhealthy eating habits as well as various combinations of these habits are linked to an increased risk of emergence of various diseases, particularly cardiovascular diseases and various types of cancer (1-3).

Healthy nutritional habits play an important role in maintaining people's health (4), while unhealthy eating habits greatly contribute to the development of chronic noncommunicable diseases, e.g. obesity, diabetes and heart and coronary diseases. Thus, healthy nutrition is regarded as a protective factor for maintaining health and quality of life (5, 6). In developed, as well as developing countries, the rates of chronic noncommunicable diseases are rapidly increasing and pose a serious problem to public health (7). Acquiring healthy habits greatly depends on the environment people live in and in particular on social determinants of health (8). Unhealthy nutrition includes several factors such as nutritional rhythm, nutritional and energy value of food, imbalanced meals and the way the food is prepared and consumed (9-13).

Among risk factors, the World Health Organisation (WHO) puts unhealthy nutrition in the forefront. This involves unsuitable consumption of fruits and vegetables, excessive use of salt and the content of saturated trans-fatty acids in food (14).

Another risk factor is precarious nutritional rhythm as opposed to correct nutrition rhythm. Precarious nutritional rhythm is characterised particularly by irregular meals and is connected with various external and internal factors. The results of research indicate that correct nutritional rhythm contributes to the improvement of lipid profile and reduction of total cholesterol levels and improvement of glucose tolerance (15, 16). Correct nutritional rhythm means having three to six meals a day: three main meals (breakfast, lunch, dinner) and one to three complementary meals, i.e. snacks. Irregular meals, skipping meals and improper nutritional rhythm are the main risk factors for the development of chronic noncommunicable diseases, malaise and work productivity (17).

Healthy nutrition means eating varied food and having nutritionally balanced menus composed of food of animal and vegetable origin (18). According to WHO recommendations, carbohydrates should cover 50 to 75% of daily energy needs, fats 15 to 30% and proteins from 10 to 15% (19). Healthy nutrition gives priority to foods that contain natural health protecting ingredients and contain small amounts of fats, particularly saturated and trans-fatty acids, simple sugars and lots of fibre and other various protective substances. According to WHO, each daily meal should contain fruits and vegetables, whole-grain food and good quality fats, low-fat milk and dairy products and a reasonable amount of lean meat and fish. Only rarely should people consume food with high content of fats and sugars and beverages with added sugar (19).

The results of the study done on nutritional habits in Slovenia, carried out in 2001, 2004 and 2008, showed some dietary deficiencies among the adult population due to incorrect nutritional rhythm, excessive amounts of health hazardous fats and salt in food and insufficient quantities of fruits and vegetables in diets (20). Such nutritional habits present a serious risk as well as a general public health problem.

At the national level, the government adopted a resolution on nutrition policy for the years 2005-2010 that was basically aimed at setting up, maintaining and strengthening healthy nutritional habits of Slovenians. The mid-term goals included increasing the consumption of fruits and vegetables, reducing the intake of saturated fats and increasing the intake of food fibre, calcium and vitamin C (21).

Within the framework of the international CINDI program, some recommendations for healthy nutrition have been proposed. These include introducing more food stuffs of plant as well as animal origin, more whole grain food, having varied diets with locally produced fresh fruits and vegetables, monitoring the amounts of fat intake and replacing saturated fats with unsaturated ones, replacing greasy and meat products with legumes, fish, poultry or lean meat, consuming recommended amounts of low-fat milk and dairy products, eating less salty food and reducing the amounts of sugar and sweets (22).

Healthy nutrition is defined by the criteria cited above, aiming at promoting healthy nutritional styles for the Slovenian population (6).

In our research, we focused on the general criteria of unhealthy nutrition and analysed the risk factors that contribute to the development of chronic noncommunicable diseases.

We studied the frequency of risk factors due to unhealthy nutrition among the adult population in Slovenia with regard to biological and sociodemographic variables.

2 METHODOLOGY

The presented research is a cross-sectional epidemiological study. The research was made using a structured interview with individuals. Structured personal interviews were carried out individually at the homes of the surveyed persons, taking 45 minutes on average. The interviewers carrying out the surveys received prior training at an educational seminar.

A special questionnaire that contained 108 groups of food was devised and adapted to the nutritional and cultural characteristics of the researched population. The interviewees estimated the frequency of their consuming a particular food or a group of foods.

A sample of respondents was obtained from the Central register of population of Slovenia. The sample included 2,381 randomly selected persons, and 1,193 of them completed the entire survey. On the basis of analysed causes for non-response in the research mentioned by the persons who refused to participate, we estimated that, regarding specific characteristics of the sample, they do not differ from the persons who agreed to participate in the research. The most frequent cause of nonresponse mentioned was being too busy (36.9% of the sample) and a dislike of surveys in principle (28.7% of the sample). The sample encompassed 1,193 randomly selected adult individuals from Slovenia from 18 to 65 years regardless of their health and nutritional condition as well as physical activity. To study biological and sociodemographic variables, the respondents were classified into various groups, presented in Table 1.

Table 1. *Criteria for the formation of groups with regard to biological and sociodemographic characteristics.*
Tabela 1. *Kriteriji za oblikovanje skupin glede na obravnavane biološke in sociodemografske značilnosti.*

Biological and sociodemographic variables/ Biološke in socio-demografska spremenljivka	Value or group of the variable/ Vrednost oziroma razred spremenljivke
Sex/ Spol	Male, female/ Moški, ženski
Age (years)/ Starost (leta)	18 to 25, 26 to 45, 46 to 65/ 18 do 25, 26 do 45, 46 do 65
Body mass index (BMI)/ Indeks telesne mase (ITM)	Up to 19.99, from 20.00 to 24.99, from 25.00 to 26.99, 27.00 or above/ Do 19.99, od 20 do 24.99, od 25.00 do 26.99, 27.00 ali več
Education/ Izobrazba	Elementary, secondary, higher and above/ Osnovnošolska, srednješolska, višja ali več
Material status according to the respondent/ Materialni standard na osnovi opredelitve anketiranca	Under average, average, above average/ Podpovprečen, povprečen, nadpovprečen
Type of employment/ Zaposlitveni status	Self employed (full time), Self employed (part time), student, retired, housewife, farmer and farmer housewife, unemployed, other/ Samozaposlen za polni delovni čas, samozaposlen za določen delovni čas, študent, upokojenec, gospodinja, kmetovalec in kmečka gospodinja, brezposeln, drugo
Type of community according to the number of inhabitants/ Tip naselja glede na število prebivalcev	Up to 2000 inhabitants, 2,000 to 50,000 inhabitants, above 50,000 inhabitants/ Do 2000 prebivalcev, 2000 do 50 000 prebivalcev, nad 50 000 prebivalcev
Region/ Regija	Western, central, eastern region/ Zahodna, osrednja, vzhodna

Slovenia has not yet formed official criteria of the Healthy Eating Index to be used to establish the quality of nourishment of the population. Following the WHO recommendations (19) and the data obtained from other research (23-27), we selected and defined ten risk factors of unhealthy eating habits, which are presented in Table 2.

Table 2. *Risk factors for the assessment of unhealthy nutrition and criteria for the assessment of unhealthy nutritional behaviour.*

Tabela 2. *Dejavniki tveganja za oceno nezdravega prehranjevanja in kriteriji nezdravega vedenja.*

Risk factors/ Dejavniki tveganja	Description of risk/ Opis dejavnika	Criteria for unhealthy behaviour/ Kriterij za nezdravo vedenje
1	Number of daily meals/ Število dnevnih obrokov	2 or less/ 2 ali manj
2	Milk and dairy products consumption frequency/ Pogostost uživanja mleka in mlečni izdelki	Less than once a day/ Manj kot enkrat na dan
3	Frequency of vegetable consumption/ Pogostost uživanja zelenjave	Less than once a day/ Manj kot enkrat na dan
4	Frequency of fruit consumption/ Pogostost uživanja sadja	Less than once a day/ Manj kot enkrat na dan
5	Frequency of red meat consumption/ Pogostost uživanja rdečega mesa	Three times a week or more/ Trikrat na teden ali več
6	Frequency of fish and sea food consumption/ Pogostost uživanja rib in morskih sadežev	Three times a month or less/ Trikrat na mesec ali redkeje
7	Frequency of whole-grain cereals consumption (groups of porridge, groats…)/ Pogostost uživanja polnozrnatih žit (kosmiči ali kaše)	Three times a month or less/ Trikrat na mesec ali redkeje
8	Frequency of fried food consumption/ Pogostost uživanja ocvrte hrane	Once a week or more/ Enkrat na teden ali pogosteje
9	Additional use of salt/ Dosoljevanje hrane	Adding salt without tasting food first/ Dosoljevanje brez predhodnega pokušanja
10	Drinks with added sugar (fizzy drinks, still drinks, water with added flavour, fruit syrup)/ Pogostost uživanja pijač z dodanim sladkorjem (gazirane, negazirane, voda z okusom, sadni sirupi)	Four to six times a week of more/ Štirikrat do šestkrat na teden ali pogosteje

The criteria are based on the frequency of consuming foods from particular food groups and were formed on the basis of available data obtained from results of the research, and, to allow comparison of data, they were at the same time adapted to the criteria used in the 2004 research (28). For most of the selected criteria (risk factors 1-4, 6 and 7 in Table 2), unhealthy eating habits are defined as the frequency value of consuming regular meals and particular foods that is considered as insufficient frequency in literature (23-26). In criteria 3 and 4 that deal with consumption of fruits and vegetables, a valid measure of diet quality used

to define the "minimum score criteria" in the article by McNaughton at al. (24) was taken as the criterion of unhealthy eating habits. In the seventh criterion that deals with consumption of whole-grain cereals, the frequency of consuming whole-grain porridges and groats was taken into account, since data for other whole-grain products was unavailable.

The data were processed by statistical analysis, using the SPSS program. First, the differences between average values of the frequency of risk factors in correlation to biological and sociodemographic variables were verified by using T-test for independent samples and variance analysis ANOVA. To determine the differences between individual groups within variables, we carried out unplanned (a posteriori) multiple comparisons (post hoc test). The Pearson's chi-squared test was applied to infer the differences between attributive variables. For statistical inference, we considered 0.05 the degree of risk.

3 RESULTS

The frequency analysis of risk factors showed that in more than fifty percent of the population in Slovenia, the risk factors appear in the category of fruits and vegetables, fish and sea food and cereals (Table 3).

Table 3. *Number and percentage of the respondents in correlation with risk factors.*

Tabela 3. *Število in delež anketirancev glede na posamezni dejavnik tveganja.*

Risk factors/ Dejavniki tveganja		f	f (%)
1	Number of meals/ Dnevno število obrokov	437	36.7
2	Milk and dairy products/ Mleko in mlečni izdelki	425	35.7
3	Vegetables/ Zelenjava	667	56.4
4	Fruit/ Sadje	376	31.8
5	Red meat/ Rdeče meso	506	42.5
6	Fish and sea food/ Ribe in morski sadeži	688	57.9
7	Whole-grain cereals /Polnozrnati žitni kosmiči in kaše	806	67.7
8	Fried food/ Ocvrta hrana	570	47.9
9	Adding salt without tasting food first/ Dosoljevanje hrane	36	3.0
10	Drinks with added sugar/ Pijače z dodanim sladkorjem	524	44.1

Adding salt without tasting food first is a less frequent factor and occurs in only 3.0% of the population. The factor that accounts for 36.7% of the population is due to improper number of meals per day, while 35.7% of the population consume milk and dairy products less than once a day (Table 3).

We wanted to determine statistical significance of individual risk factors correlated with biological and sociodemographic variables (Table 4). We found that there is a statistical correlation between nine risk factors and gender. In all risk factors where we found statistical significant correlation, the percentage of males is higher than in females. Education is the second most important factor: in six risk factors (numbers 4, 5, 6, 7, 8 and 10), it was found that the smallest share per particular risk factor is accounted for by persons with higher education, while the risk factor related to irregular intake of meals (number 1) and vegetables (number 3) is least frequent with persons with elementary education. Education status correlates with eight risk factors, however it is not proven that a particular status is markedly correlated with several risk factors. The analysis showed that the percentage of those who regularly have at least three meals a day is highest among farmers and farmer housewives. The latter most frequently consume fruits and vegetables and least frequently meat. As for employment status, the smallest risk due to the consumption of cereals and red meat was found among students. As for the age factor, the percentages of risk factors 1, 3, 4, 8 and 10 are highest among persons within the age group from 46 to 65 years, with the exception of risk factor 7 where the percentage is lowest among persons between 18 to 25 years. Statistical correlation between regions and risk factors was found with factors 2, 3, 5, 6, 8 and 10. Most persons with five risk factors (2, 3, 5, 8 and 10) come from eastern regions of Slovenia. Our research also showed a correlation between the size of the community the respondents live in and risk factors. People coming from communities with more than 50,000 inhabitants consume less red meat, beverages with added sugar, fried food and cereals, while this is most frequent in communities with 2,000 inhabitants. A correlation between risk factors and BMI was found in factors 1, 5, 7 and 10: the lowest percentage of risk factors 1, 5 and 7 was found in the group of respondents with BMI below 20.00, while the highest percentage with persons with BMI 27.00 or above correlate with risk factors 1 and 7. Material status correlates only with risk factors 5 and 7. The highest percentage of persons with these two risk factors was found among those with below average

material status and the lowest among those with above average material status.

If we take a look at the horisontal lines in Table 4, we can see that the lowest correlation is between the risk of adding salt to food and biological and sociodemographic factors. A low correlation is also observed in the consumption of milk and dairy products, fish and sea food. On the other hand, higher correlation was found between the risk factors related to the consumption of red meat, cereals and beverages with added sugar.

Table 4. *Correlation between risk factors and biological and sociodemographic characteristics.*
Tabela 4. *Pregledna tabela povezanosti dejavnikov tveganja z biološkimi ter sociodemografskimi značilnostmi.*

Risk factors/ Dejavniki tveganja		Sex/ Spol	Standard/ Standard	Education/ Izobrazba	Type of community/ Tip naselja	Age/ Starost	BMI/ ITM	Region/ Regija	Employment status/ Zaposlitveni status
1	Number of daily meals/ Dnevno število obrokov	*		*		*	*		*
2	Milk and dairy products/ Mleko in mlečni izdelki	*						*	
3	Vegetables/ Zelenjava	*		*		*		*	*
4	Fruit/ Sadje	*		*		*			*
5	Red meat/ Rdeče meso	*	*	*	*		*	*	*
6	Fish and sea food/ Ribe in morski sadeži			*				*	*
7	Whole-grain cereals/ Polnozrnati žitni kosmiči in kaše	*	*	*	*	*	*		*
8	Fried food / Ocvrta hrana	*		*	*	*		*	
9	Adding salt/ Dosoljevanje hrane	*							
10	Drinks with added sugar/ Pijače z dodanim sladkorjem	*		*	*	*	*	*	*

Legend/ Legenda: * p < 0.05

In our study, we correlated the frequency of individual risk factors with different variables to find that on average there are 4.2 risk factors that endanger the health of Slovenians. The percentage of those who have developed nutritional habits with five or more risk factors is 43.9%, and only 1.8% have no risk factor. The largest share (21.4%) is accounted for by those with four risk factors (Table 5).

Table 5. *Percentage of persons and the number of risk factors.*

Tabela 5. *Delež oseb s posameznim številom dejavnikov tveganja.*

Number of risk factors/ Število dejavnikov tveganja	f	f (%)
0	21	1.8
1	64	5.5
2	136	11.6
3	184	15.7
4	250	21.4
5	217	18.6
6	178	15.2
7	73	6.2
8	34	2.9
9	12	1.0
Total/ Skupaj	1,169	100.0

The correlation between risk factors and biological variables, where we considered the gender and body mass index of the respondents, indicates that the average number of risk factors among the male population is (M = 4.85), which is statistically more significant (p < 0.05), and the average number of risk factors among females is (M = 3.72) (Table 6).

We also found that the number of risk factors decreases by age (Table 7). The smallest percentage of risk factors was found among adults between 46 and 65 years of age (M = 4.96), and the highest among persons between 18 and 25 years (M = 4.82). A multiple comparison test on the average number of risk factors showed that the difference between age groups is statistically significant (p < 0.05).

The analysis of risk factors by different groups of respondents according to their BMI showed no statistically significant differences (p > 0.05) - Table 7.

Table 6. *Number of risk factors and gender.*

Tabela 6. *Število dejavnikov tveganja glede na spol.*

Gender/ Spol	Risk factors (M)/ Dejavniki tveganja (M)	SD	t	p
Male/ Moški	4.85	1.72	10.829	0.000
Female/ Ženske	3.72	1.81		

Among demographic variables, we considered the material standard of the respondents, level of education, size of the community they live in, region and employment status. As far as the material standard is concerned, the highest number of risk factors was found among persons with below average standard (M = 4.61), and the lowest (M = 3.91) among persons with above average material standard. Multiple comparison test between the groups showed that there is a statistically significant difference between a person with below average standard and those with average or above average standard, while no such statistical difference was found in persons between average and above average standard (p > 0.05).

Correlation with level of education shows that persons with higher education have the fewest health risk factors (M = 3.59), while the differences between the respondents with elementary and secondary education show no statistical significance. Persons living in towns with more than 50,000 inhabitants have fewer risk factors (M = 3.96) compared to those who live in smaller communities (p < 0.05). The average number of risk factors in persons living in smaller (M = 4.34) and medium sized communities (M = 4.10) is statistically insignificant (Table 7).

A correlation between risk factors and geographical region indicates that the lowest rate of risk factors is found in western regions of Slovenia (M = 3.94). With multiple comparison test between regions, we found that the eastern region stands out (M = 4.48) and differs both from the western and central region (M = 4.07). There are no statistically significant differences between the western and central regions in Slovenia (p = 0.387) - Table 7.

As for employment status, the highest rate of risk factors was found among the student population (M = 4.55) and among retired persons (M = 3.69). By multiple comparison calculations between the retired population and other groups, we noticed some statistically significant differences within the group of self-employed people with part time employment (p = 0.00), students (p = 0.00), farmers and farmer housewives (p = 0.05) and unemployed people (p = 0.04) - Table 7.

Table 7. *Average number of risk factors in correlation with demographic variables.*
Tabela 7. *Povprečna vrednost števila dejavnikov tveganja glede na demografske spremenljivke.*

Biological and sociodemographic variables/ Biološe in socio-demografska spremenljivka	Value or group of the variable/ Vrednost oziroma razred spremenljivke	Risk factors (M)/ Dejavniki tveganja (M)	SD	F	p
Material standard/ Materialni standard	Low/ Podpovprečen	4.61	1.91	5.693	0.003
	Average/ Povprečen	4.18	1.85		
	Above average/ Nadpovprečen	3.91	1.78		
Education/ Izobrazba	Elementary or less/ Osnovna šola ali manj	4.38	1.88	18.504	0.000
	Vocational or secondary/ Poklicna ali srednja šola	4.38	1.86		
	Higher or above/ Višja ali več	3.59	1.69		
Place of living (number of inhabitants)/ Kraj bivanja glede na število prebivalcev	Up to 2,000/ Do 2,000	4.34	1.78	3.950	0.020
	from 2,000 to 50,000/ Od 2,000 do 50,000	4.10	1.92		
	More than 50,000/ Več kot 50,000	3.96	2.00		
Age (years)/ Starost (leta)	Up to 26/ Do 26	4.82	1.78	15.594	0.000
	From 26 to 45/ Od 26 do 45	4.24	1.89		
	46 or above/ Več kot 46	3.95	1.81		
BMI/ ITM	Up to 19.99/ Do 19.99	4.01	1.79	1.759	0.153
	From 20 to 24.99/ Od 20 do 24,99	4.16	1.87		
	From 25.00 to 26.99/ Od 25.00 do 26.99	4.07	1.87		
	27.00 or above/ 27.00 ali več	4.37	1.81		
Region/ Regija	Western/ Zahodna	3.94	1.82	9.645	0.000
	Central/ Osrednja	4.07	1.88		
	Eastern/ Vzhodna	4.48	1.82		
Employment status/ Zaposlitveni status	Full time employees/ Polni delovni čas	4.32	1.82	3.341	0.002
	Part-time employees/ Skrajšani delovni čas	3.83	2.40		
	Student/ Študent	4.55	1.89		
	Retired persons/ Upokojen	3.69	1.74		
	Housewife/ Gospodinja	4.28	1.87		
	Farmer and farmer housewife/ Kmetovalec ali kmečka gospodinja	4.35	1.57		
	Unemployed/ Brezposeln	4.22	1.89		
	Other/ Drugo	4.28	1.92		

4 DISCUSSION

The study, which was carried out in Slovenia in 2004, showed that as much as 46.6% of the Slovenian population have developed unhealthy nutrition habits. The percentages with above average numbers of health risk factors were found among men between ages 30 to 39 and 40 to 49 years, those with completed vocational education, middle class employed persons and those coming from eastern Slovenian rural areas (28, 29). With these findings in mind, we wanted to compare whether the situation has changed after the implementation of the National Nutrition Policy Programme in 2005 – 2010.

Number of daily meals

Since Fabry's thesis (30) was published, namely that the number of daily meals could potentially have impact on the development of pathological conditions, various authors have studied the impacts of the frequency of meals in correlation with different parameters (31).

The results from our study show that less than a third of respondents have two meals (or less) a day, and the percentage is even higher among the youngest population (50%). Two meals a day is most frequent among fully employed people and students.

Milk and dairy products

Milk and dairy products are important sources of proteins and calcium and should be consumed on a daily basis, particularly low fat products.

Table 3 shows that insufficient consumption of milk and dairy products occurs in 35.7% of the population and is more expressed among men coming from the eastern Slovenian region.

Vegetables and fruit

Vegetables and fruits are the sources of vitamins and minerals and the sources of antioxidants that counteract oxidative stress (32, 33). For this reason, raw and cooked vegetables and fruit should be regularly incorporated into diets.

From the results of our research, we can infer that vegetables and fruits are frequently on the menus since there were no respondents who consume this food less than once a day. If we compare this with the results of the research from 1997, we can observe a positive trend - the percentage is now higher (34).

Regular consumption of vegetables and fruit decreases the risks of heart and coronary diseases (35), and for this reason and following the National nutrition policy (19) and WHO recommendations (36), this aspect of nutrition has been recently highly promoted and positive effects are already reflected in our study; we found that only 5.7% of the population consume fruit less than once a day.

Red meat

Some epidemiological studies have pointed out that there is a correlation between the consumption of red meat and meat products and cardiovascular diseases and colon cancer, while they also emphasise positive effects of n-3 polyunsaturated fatty acids and conjugated linoleic acid found in red meat (37). Some authors also emphasise the risks of red meat consumption for the development of cancer that is due to carcinogenic polycyclic amines formed during thermal processing of meat (38). Others point out synergistic effects between heterocyclic amines and fats in meat (3). A recommended amount of red meat is 300 g per week, which means a portion of meat less than three times a week (39).

As for red meat consumption, the results of our study indicate unhealthy behaviour among men with elementary education, those living in small communities and adults in the age group from 46 to 65 years.

Fish

It is generally known that fish contain omega-3 fatty acids, particularly docosahexanoic acid, and prevent coronary heart diseases and hypertension (40). It has been found that regular consumption of fish on a weekly basis has positive effects on the vitality of the brain and prevents Alzheimer disease (41). It has also been reported that the consumption of fish reduces the risks of sudden heart failure and myocardial infarction (42, 43). Nutrition experts recommend two meals of fish per week (44).

The data we have obtained show that fish is not frequently on menus, since 60% of the respondents consume fish and sea food less than three times per month (57.9% - Table 3). Statistically significant differences have been found in groups with different education level, geographical region and employment standard.

Whole-grain cereals

Whole-grain cereals are a good source of dietary fibre. The results of our study show that 65% of the respondents consume whole-grain cereals maximum three times a month, and by this criterion we can consider this as unhealthy nutrition. Within different groups and correlations with variables, it seems that higher risks occur among men, persons with BMI above 27, those with vocational education and persons living in smaller communities coming from western regions of Slovenia.

Fried food

Fried food elevates the content of fat in the blood and for this reason it should be scarcely used and reduced in diets (45).

Our criterion was that fried food consumed once a week is unhealthy, and according to our study almost half of the respondents (47.9%) consume fried food once a week. With regard to sociodemographic variables, fried food is more popular among men, the younger population and those with lower education from western regions of Slovenia.

Adding salt

Adding salt to food without previously tasting it is an acquired habit. Approximately 15% of the daily amount of salt is added during food preparation and cooking and during eating food at a table (46).

We found that 3% of the respondents add salt to food without previously tasting it. This is more frequent among men from the age group of 26 to 45 years and those with vocational education and lower material standard.

Sweet non-alcoholic beverages

Consumption of sweet non alcoholic beverages is another criterion of unhealthy nutrition and contributes to the development of obesity and leads to chronic noncommunicable diseases (12, 46). Such beverages include fizzy and still non alcoholic drinks, waters with added flavour and fruit syrups. In our study, we found that as much as 44% of the respondents consume sweet drinks four to six times a week, which is considered as a bad nutritional habit. This is most frequent among men with lower education, persons with BMI above 27 and those living in smaller communities.

Percentage of the respondents in correlation with risk factors

According to our results (Table 3), we can conclude that the percentages we have obtained by analysing different risk factors vary. The majority of the respondents (36.1%) have two or even less meals. Since this risk factor has already been identified in our previous research (14, 47), we can conclude that since 2010, during the implementation of the nutrition policy programme, no improvement has been made (21). Correlation between risk factors and biological and sociodemographic characteristics showed statistically significant differences between males and females, different education, geographical region, age and employment status (Table 4).

5 CONCLUSION

The results of our study show that a significant percentage of the population in Slovenia still has unhealthy nutritional habits that are not along the lines of the recommendations for healthy nutrition (10, 20, 28, 48).

It was found that only 4.7% of the people practice healthy nutritional habits without any risk factors, 22.5% of the respondents have one or two risk factors that can be considered as still acceptable and as much as 62.8% of the respondents had several risk factors, which is considered as unhealthy nutrition. In the study that was carried out in 2004, the share of those with unhealthy nutrition was 46.6% (28), however the methodologies applied in the two studies are not comparable.

The results of the research are a significant indicator of the general state of occurrence of nutritional risk factors among the Slovenian population. They represent a starting point for designing studies through which particular nutritional risk factors can be studied in detail and to form national criteria (diet quality indices) of unhealthy eating habits. These criteria could be employed to monitor, on a larger scale, the eating habits of the Slovenian population and to compare them in longitudinal epidemiological studies as well as to find correlations with other health risk factors.

The most frequent risk factors are the lack of whole-grain cereals and fish and vegetables consumption, followed by too much fried food, beverages with added sugar and red meat as well as improper number of daily meals and milk and dairy consumption, followed by insufficient quantities of fruits and risks due to adding salt to food.

Correlating the biological and sociodemographic factors with risk factors, we found that most risk factors correlate with gender, education, employment status, age, region, size of the community, nutritional status and material standard.

The results show that unhealthy nutrition is more frequent among people with below average material standard, elementary education, those living in smaller communities, the young, those with high BMI, those living in eastern regions of Slovenia and among students. We can infer that nutritional habits of the male population are poorer, which means that men have a greater chance for the development of diseases.

For all these reasons together with the fact that people are not responding to recommendations for healthy nutrition, future actions should be targeted at the groups where we found several risk factors.

We believe that our results can contribute to the preparation and implementation of a new national nutrition policy, since the results indicate those sociodemographic population groups that show a higher incidence of the analysed nutritional health risks and the population groups that require priority treatment.

A solution to reduce sociodemographic differences among the population is to continue the measures

for reducing the sociodemographic differences and to develop programs for the promotion of healthy lifestyle, which means that a complex approach should be taken in which nutrition is an important factor.

Besides appropriate nutrition, physical activity of the population and their giving up unhealthy habits such as smoking and alcohol consumption should be promoted in order to maintain and improve the health of the population (49).

References

1. World Health Organization. Global status report on noncommunicable diseases 2010. Geneva: World Health Organization, 2011. Available Jun 15, 2013 at: http://whqlibdoc. who.int/publications/2011/9789240686458_eng.pdf.

2. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair Rohani H et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380: 2224-60.

3. Jantine Schuit A, Van Loon JM, Tijhuis M, Ocke MC. Clustering of lifestyle risk factors in a general adult population. Prev Med 2002; 35: 219-24.

4. World Health Organization. Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO Expert Consultation. Geneva: World Health Organization, 2003.

5. Hlastan Ribič C. Zdrava prehrana kot temelj zdravja. In: Hlastan-Ribič C, editor. Cvahtetovi dnevi javnega zdravja 2010, Zdrava prehrana in javno zdravje: zbornik prispevkov. Ljubljana: Univerza v Ljubljani, Medicinska fakulteta, 2010: 5-26.

6. Gabrijelčič Blenkuš M, Kuhar D. Prehranjevalne navade in prehranski status – pregled stanja v Sloveniji in svetu. In: Gabrijelčič Blenkuš M, editor. Prehrambene navade odraslih prebivalcev Slovenije z vidika varovanja zdravja II. Ljubljana: Univerza v Ljubljani, Pedagoška fakulteta, 2009: 9-21.

7. European Health for All Database (HFA-DB). World Health Organization,. 2012. Available Dec 15, 2012 at: http://www.euro. who.int/hfadb.

8. World Health Organization. Closing the gap in a generation: commision on social determinants of health report. Geneva: World Health Organization, 2008.

9. Pokorn D. Zdrava prehrana in dietni jedilniki: priročnik za praktično predpisovanje diet. Zdrav Var 1997; 36 (Suppl 8): 22-33.

10. Koch V. Prehrambene navade odraslih Slovencev z vidika varovanja zdravja: doktorska disertacija. Ljubljana: Biotehnična fakulteta, 1997.

11. Whitney EN, Cataldo C B, Rolfes S R. Understanding normal and clinical nutrition. 6th ed. Belmont: Wadsworth Thomson Learning, 2002.

12. Insel PM, Turner RE, Ross D. Nutrition. 2nd ed. London: Jones and Bartlett, 2004.

13. Brown JE. Nutrition through the life cycle. 3th ed. Belmont: Wadsworth, Thomson Learning, 2008.

14. World Health Organization. Obesity and overweight. Available Dec 10, 2012 at: http://www.who.int/mediacentre/factsheets/ fs311/en/.

15. Louis Sylvestre J, Llunch A, Neant F, Blundell JE. Highlighting the positive impact of increasing feeding frequency on metabolism and weight management. Forum Nutr 2003; 56: 126-8.

16. Gatenby SJ. Eating frequency: metodological and dietary aspects. Br J Nutr 1997; 77(Suppl 1): 7-20.

17. Pokorn D, Maučec Zakotnik J, Močnik Bončina U, Koroušić Seljak B. Smernice zdravega prehranjevanja delavcev v delovnih organizacijah. Ljubljana: Ministrstvo za zdravje Republike Slovenije, 2008.

18. National Research Council. Diet and health: implication for reducing chronic disease risk: report of the Committee on Diet and Health, Food and Nutrition Board, Commission on Life Sciences. Washington: Academy Press, 1989.

19. World Health Organization. Diet, nutrition and the prevention of chronic diseases. Geneve: World Health Organization, 2003.

20. Inštitut za varovanje zdravja Republike Slovenije. Z zdravjem povezan vedenjski slog. Available Nov 26, 2012 at: http://www. ivz.si/Mp.aspx?ni=78&pi=6&_6_id=2196&_6_PageIndex=1&_6_ groupId=-2&_6_newsCategory=IVZ+kategorija&_6_ action=ShowNewsFull&pl=78-6.0.g 2012.

21. Ministrstvo za zdravje Republike Slovenije. Resolucija o nacionalnem programu prehranske politike 2005-2010. 2005. Ur List RS (39): 3681-719.

22. CINDI. 12 korakov do zdravega prehranjevanja. Available Oct 2, 2012 at: http://www.cindi-slovenija.net/index.php?option=com_ content&id=128&Itemid=128.

23. Status report on the European Commision´s work in the field on nutrition in Europe. Bruxelles: European Comission, 2002.

24. McNaughton SA, Ball K, Crawford D, Mishra GD. An index of diet and eating patterns is a valid measure of diet quality in an Australian population. J Nutrition 2007; 138: 86-93.

25. Dubois L, Girard M, Bergeron N. The choice of a diet quality indicator to evaluate the nutritional health of populations. Public Health Nutr 2000; 3: 357-65.

26. Kant AK. Indexes of overall diet quality: a review. J Am Diet Assoc 1996; 96: 785-91.

27. Koch V, Pokorn D. Comparison of nutritional habits among various adult age groups in Slovenia. Nutr Res 1999; 19: 1153-64.

28. Zaletel Kragelj L, Pavčič M, Koch V, Maučec Zakotnik J. Nezdravo prehranjevanje. In: Zaletel Kragelj L, Fras Z, Maučec-Zakotnik J. editors. Tvegana vedenja, povezana z zdravjem in nekatera zdravstvena stanja pri odraslih prebivalcih Slovenije. II. Tvegana vedenja. Ljubljana: Univerza v Ljubljani, Medicinska fakulteta, Katedra za javno zdravje, 2004: 191-250.

29. Zaletel Kragelj L, Pavčič M, Maučec Zakotnik J, Koch V, Fras Z. Nezdravo prehranjevanje, povezano s prekomerno prehranjenostjo, debelostjo in diabetesom. In: Zaletel Kragelj L, Fras Z, Maučec Zakotnik J. editors. Tvegana vedenja, povezana z zdravjem in nekatera zdravstvena stanja pri odraslih prebivalcih Slovenije. II. Tvegana vedenja. Ljubljana: Univerza v Ljubljani, Medicinska fakulteta, Katedra za javno zdravje, 2004: 251-83.

30. Fabry P, Tepperman J. Meal frequency: a possible factor in human pathology. Am J Clin Nutr 1970; 23: 1059-68.

31. Parks EJ, McCrory MA. When to eat and how often? Am J Clin Nutr 2005; 81: 3-4.

32. ao G, Booth S L, Sadowski JA, Prior RL. Increases in human plasma antioxidant capacity after consumption of controlled diets high in fruit and vegetables. Am J Clin Nutr 1998; 68: 1081-7.

33. Prior RL. Fruits and vegetables in the prevention of cellular oxidative damage. Am J Clin Nutr 2003; 78(Suppl 3): S570S-8.

34. Koch V, Kostanjevec S. Pogostost uživanja živil. In: Gabrijelčič Blenkuš M, editor. Prehrambene navade odraslih prebivalcev Slovenije iz vidika varovanja zdraja II. Ljubljana: Univerza v Ljubljani, Pedagoška fakulteta, 2009: 61-85.

35. Dauchet L, Amouyel P, Hercberg S, Dallongeville J. Fruit and vegetable consumption and risk of coronary heart disease: a meta-analysis of cohort studies. J Nutr 2006; 136: 2588-93.

36. World Health Organization. Global strategy on diet, physical activity and health. Available Oct 15, 2012 at:. http://www.who. int/dietphysicalactivity/strategy/eb11344/strategy_english_web. pdf .

37. McAfee JA, McSorley ME, Cuskelly JG, Moss WB, Wallace MWJ, Bonham PM, Fearon MA. Red meat consumption: an overview of risks and benefits. Meat Sci 2010; 84: 1-13.

38. Bingham SA, Hughes R, Cross AJ. Effect of white versus red meat on endogenous N-nitrosation in the human colon and further evidence of a dose response. J Nutr 2002; 132: S3522–5.

39. World Cancer Research Fund, American Institute for Cancer Research. Food, nutrition and the prevention of cancer: a global perspective. Washington, DC: American Institute for Cancer Research, 2007. Available Jan 10, 2013 at: http://www.wcrf.org/cancer_research/cuo/recommendation.php.

40. Djousse L, Akinkuolie A O, Wu JHY, Ding EL, Gaziano JM. Fish consumption, omega 3-fatty acids and risk of hart failure: a meta-analyses. Clin Nutr 2012; 31: 846-53.

41. Apostolova GL, Thompson PM. Mapping progressive brain structural changes in early Alzheimer's disease and mild cognitive impairment. Neuropsychologia 2008; 46 (6): 1597-1612.

42. Žemva A. Kardioprotektivni učinki ribjega olja in omega-3 večkrat nenasičenih maščobnih kislin. Zdrav Vest 2004; 73: 37-9.

43. Calder PC. Long-chain fatty acids and cardiovascular disease: further evidence and insight. Nutr Res 2004; 24: 761-72.

44. British Nutrition Foundation. Nutrition science: risk of deseases. Available Dec 15, 2012 at: http://www.nutrition.org.uk/nutritionscience/disease/hart-disease.

45. Gabrijelčič Blenkuš M. Prehrana mladostnika. In: Kostanjevec S, Torkar G, Gregorič M, Gabrijelčič Blenkuš M, editors. Zdrav življenjski slog srednješolcev: priročnik za učitelje. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije, 2005: 25-34.

46. World Health Organization. Reducing salt intake in populations: report of a WHO Forum and technical meeting 5-7 October 2006. Paris, Geneva: World Health Organization, 2007.

47. Jou J, Techakehakij W. International application of sugar-sweetened beverage (SSB) taxation in obesity reduction: factors that may influence policy effectiveness in country – specific contexts. Health Policy 2012; 107: 83-90.

48. Gabrijelčič Blenkuš, M. Periodičnost uživanja obrokov. In: Gabrijelčič Blenkuš M, editor. Prehrambene navade odraslih prebivalcev Slovenije iz vidika varovanja zdravja II. Ljubljana: Univerza v Ljubljani, Pedagoška fakulteta, 2009: 43-60.

49. World Healt Organization. Draft action plan for the prevention and control of noncommunicable diseases 2013-2020: report by the Secretariat. Available Jun 15, 2013 at: http://www.who.int/nmh/publications/ncd_action_plan2013.pdf.

A TIME-TREND ANALYSIS OF INTENDED CAREER CHOICE FOR FAMILY MEDICINE AMONG CROATIAN MEDICAL STUDENTS

ANALIZA ČASOVNEGA TRENDA PREDVIDENE IZBIRE POKLICA ZDRAVNIK SPECIALIST DRUŽINSKE MEDICINE MED HRVAŠKIMI ŠTUDENTI MEDICINE

Jelena Evic[1], Gordana Pavlekovic [2], Lucija Murgic [2], Hana Brborovic [2]

Abstract

Aim: *To gain insight into the trend of career choice for family medicine in Croatia in recent years.*

Methods: *Six surveys were performed in the academic years 2006/07-2011/12 at the University of Zagreb, School of Medicine. Altogether, 1140 6th year students participated. They anonymously completed a questionnaire containing questions on desired future specialisation as well as other selected characteristics (e.g. gender, desired area and place of work, motivation to study medicine, etc.). Binary logistic regression was used to determine unadjusted and adjusted trends.*

Results: *After adjustment for selected factors, the relationship between observed outcome and the year of observation showed an evident decreasing trend. The odds for intention to specialise in family medicine were in the academic year 2006/2007 1.43-times higher than in the year 2007/2008 (p=0.412), 1.85-times higher than in the year 2008/2009 (p=0.168), 2.38-times higher than in the year 2009/2010 (p=0.051), 2.63-times higher than in the year 2010/2011 (p=0.027) and 3.85-times higher than in the year 2011/2012 (p=0.003).*

Conclusions: *The results of the present study offer evidence that Croatia is experiencing a constantly decreasing trend of career choice for family medicine in recent years. It is obvious that final year medical students are not very much interested in working as family practitioners. At the same time, demand for family practitioners in Croatia is increasing. Both academic and professional societies have a social responsibility to reorient the health care system and medical curricula towards comprehensive primary health care in which family medicine has a key role.*

Key words: medical students, career choice, family medicine, Croatia

Izvleček

Izhodišče: *Pridobitev vpogleda v trend izbire poklica zdravnik specialist družinske medicine na Hrvaškem v zadnjih letih.*

Metode: *V študijskih letih 2006/7–2011/12 je bilo na Medicinski fakulteti Univerze v Zagrebu opravljenih šest raziskav, v katerih je skupaj sodelovalo 1.140 študentov 6. letnika. Ti so anonimno izpolnili vprašalnik z vprašanji o željeni prihodnji specializaciji in drugih izbranih karakteristikah (npr. spol, željeno področje in kraj dela, motivi za študij medicine itn.). Za določitev neprilagojenih in prilagojenih trendov je bila uporabljena binarna logistična regresija.*

Rezultati: *Po prilagoditvi izbranih dejavnikov je bil pri povezavi med opazovanim rezultatom in letom opazovanja ugotovljen jasen padajoči trend. Verjetnost izbire specializacije iz družinske medicine je bila v študijskem letu 2006/2007 1,43-krat večja kot v letu 2007/2008 (p = 0,412), 1,85-krat večja kot v letu 2008/2009 (p = 0,168), 2,38-krat večja kot v letu 2009/2010 (p = 0,051), 2,63-krat večja kot v letu 2010/2011 (p = 0,027) in 3,85-krat večja kot v letu 2011/2012 (p = 0,003).*

Zaključki: *Rezultati te raziskave dokazujejo, da je v zadnjih letih na Hrvaškem prisoten stalno padajoči trend pri izbiri poklica zdravnik specialist družinske medicine. Očitno je, da študenti zadnjega letnika medicine niso*

[1]Family practice in concession, Zagreb, Croatia
[2]University of Zagreb, School of Medicine, Andrija Štampar School of Public Health, Rockefellerova 4, 10000 Zagreb, Croatia
 Correspondence to: e-mail: gpavleko@snz.hr

preveč zainteresirani za delo zdravnika družinske medicine. Hkrati pa se na Hrvaškem povečuje potreba po tovrstnih zdravnikih. Tako akademska kot strokovna združenja so družbeno odgovorna za preoblikovanje sistema zdravstvenega varstva in študijskih programov medicine v celovito primarno zdravstveno varstvo, v katerem ima družinska medicina ključno vlogo.

Ključne besede: študenti medicine, izbira poklica, družinska medicina, Hrvaška

1 INTRODUCTION

Family medicine, being the base of primary health care, is of special importance for every health care system (1-3), especially where it functions as the "gate keeper" specialty that directs patients to other clinical specialists, if needed. For that reason, for efficient functioning of the whole system, it is vital to have family practitioners who are professional, understand the problems in primary health care and know how to professionally handle them out (1, 2). The approach to the patient and relationship between the patient and his/her family practitioner as well as the methodology of work and patient's demands are fairly different from the hospital/clinical environment; family medicine is expected to have certain personality characteristics of practitioners working in this field (3). Career choice as well as choice of further future specialty training are important professional decisions in the life of a young person (4). Factors influencing their motivation when choosing medical career as a professional commitment are numerous and diverse (5-10), including the educational system that often does not depict the real work of certain specialists, as in clinical hospitals predominantly sophisticated health care is performed (11). The reasons why medical students choose careers in family medicine include medical school characteristics (12, 13), personal interactions (14, 15), personal fit and workforce factors, job opportunities, longitudinal care and societal needs (16, 17). Unfortunately, several countries around the world are experiencing a decreasing trend in career choice for family medicine (18-32), although World Health Organisation increasingly stresses the importance of the primary health care level (33), where family medicine is of the utmost importance.

Croatia is a South Eastern European (SEE) country in transition that has experienced, in the past two decades, many political and economic changes, including changes in the health sector (34, 35). The health care system was, like in other SEE as well as in Central and Eastern Europe countries, originally predominantly oriented towards hospital treatment (36-38). Consequently, it became very expensive, and a reorientation became inevitable. The main changes were directed towards the introduction of market principles and privatisation of the health sector (35, 39). In the new concept of health care system, an important role should be played by a family doctor with a private concession. However, the process is rather slow, and according to the data from the Croatian National Institute for Public health for the year 2011 in Croatia 58.5% of medical doctors still work as clinical specialists in hospitals, while prospectively 15.0% work as family medicine private practitioners (in concession) and 9.2% as family practitioners in health centres (26). The results of a study that examined the specialty preferences among Zagreb University School of Medicine students additionally showed that the three most desirable specialties were internal medicine, paediatrics and surgery, while family medicine was in sixth place (40). However, none of the studies in Croatia (or in the wider SEE region) have yet tried to make a comprehensive assessment of the trends of career choice for family medicine in students of medicine yet.

Aiming at getting insight into the trend of career choice for family medicine in Croatia, the objective was to examine the trend of percent of students who opted for this specialty, adjusted for selected characteristics in recent years.

2 METHODS

2.1 Participants and data collection methods

The series of cross-sectional surveys were performed in the academic years 2006/07 to 2011/12 at the University of Zagreb, School of Medicine. Participants were six consecutive generations of 6th year students. Altogether, 1294 students were invited to participate in the study.

A questionnaire, which was developed about a decade ago by the teaching staff of the Andrija Stampar School of Public Health of University of Zagreb, School of Medicine, was used as a study instrument. It was anonymously completed by participants. The data were collected during the regular course "Organisation and management in health care".

2.2 Observed outcome

The basic information on observed outcome was collected by a question "Which specialisation you would like to choose, if possible". The students could

choose between 16 options: 1=do not know yet, 2=family medicine/general practice, 3=epidemiology, 4=public health, 5=surgery, 6=gynaecology, 7=otorinolaringology, 8=ophthalmology, 9=internal medicine, 10=paediatrics, 11=geriatrics, 12=neurology, 13=psychiatry, 14=dermatology, 15=radiology and 16=something else. For the purpose of analysis, options offered were grouped into following categories: 1=family medicine/general practice (option 2), 2=clinical specialties (options 5 to 15), 3=public health specialties (options 3 and 4) and 4=other options (option 16). For the purpose of multivariate analysis, an additional form of observed outcome was created: intention to specialise in family medicine (0=no; 1=yes).

2.3 Statistical analysis

Firstly, the analysis of distribution of desired specialties and other employment options was done among all participants for the entire observation period, including those who did not express their desire for professional career yet. From the analyses that followed, this group was excluded.

Secondly, the observed outcome was univariately related to the year of observation, gender (1=male, 2=female), place of birth (1=large city, 2=middle sized town, 3=village), desired area of work (1=physician in the countryside, 2=medical practitioner in town, 3=hospital doctor, 4=other: researcher, doctor in the laboratory, public health worker, health politician) and desired place of work (1=Zagreb, 2=area where they grew up, 3=other parts of Croatia, 4=abroad (developed western countries or elsewhere abroad)) as well as motivation to enter the School of Medicine, relevance of selected medical school curriculum subjects for future work in the healthcare sector and their opinion on the reputation of family practitioner. Two dimensions of motivation to enter the School of Medicine, being internal and external, were assessed. Three elements of internal (to help those who suffer, to help our nation become healthier, to learn successfully to cure) and three elements of external motivation (to achieve a respectful and secure profession, to have enough time for other life interests, to earn a lot of money and to live well) were assessed on a 5-level scale (5=highest motivation, 1=lowest motivation). The sum of answers to both sets of questions on motivation as well as the total sum and the percentage of the total sum that could be attributed to internal motivation were calculated. Finally, a binary variable as to whether the internal motivation contributed 50% or more to total motivation (0=less than 50% 1=50% or more) was designed. The opinion on the reputation of family practitioner was assessed on a 6-level scale (6=the most respectful and prestigious, 1=the least respectful and prestigious). For the purpose of analysis, the levels were grouped into 3 categories of reputation: 1=very low or low (levels 1 and 2), 2=medium (levels 3 and 4) and 3=high or very high (levels 5 and 6). The relevance of selected medical school curriculum subjects (biochemistry, anatomy, clinical subjects, public health subjects, medical ethics) was also assessed on a 5-level scale (5=the most important, 1=the least important). The complex information encompassed in 5 separate variables was compressed into a new binary variable as to whether the student assigned high or very high relevance to all subjects or at least to clinical and public health subjects and medical ethics or not (0=no, 1=yes). The strength of the association between observed outcome and just described characteristics of participants was estimated by using a chi-square test.

Finally, in the group of those participants who opted for family medicine/general practice or one of clinical specialties, logistic regression (direct method) was used to estimate the strength of the association between observed outcome and academic year of observation adjusted to other selected characteristics of participants using a multivariate method. The dummy variables were created for all independent variables considered in the multivariate analysis. The simple method was applied (the group with the lowest frequency of observed outcome was assigned as the reference group except in academic year of observation where the first year of observation was the reference category). Before defining the full multivariate model, the basic models with only one independent variable were defined.

In all statistical tests, a p-value of 0.05 or less was considered significant.

Statistical analyses were carried out using the SPSS 17.0 (SPSS Inc., Chicago, IL, USA) statistical software package.

2.4 Ethical aspects

The study was entirely conducted according to the ethical principles and participants' confidentiality.

3 RESULTS

3.1 Description of the study group

1140 students (2006: 116 or 10.2%; 2007: 164 or 14.4%; 2008: 185 or 16.2%; 2009: 219 or 19.2%; 2010: 200 or 17.5%; 2011: 256 or 22.5%) participated in the study (response rate 88.1%).

Among participants, there were 421 (37.2%) males and 712 (62.8%) females. 559 (49.5%) came from a large city, 512 (45.3%) from a middle sized town and 59 (5.2%) from a village.

Out of 1140 respondents, 899 (78.9%) had indicated their specialty of choice, while 241 still haven't made up their mind on future specialisation. The most popular specialties in the entire observation period were internal medicine and surgery, while family medicine was in third place (Table 1).

Table 1. *The distribution of frequency of desired future career choices, reported by 6th year students of the School of Medicine, University of Zagreb, in the academic years 2006/07-2011/12.*

Tabela 1. *Porazdelitev pogostosti izbire želenega poklica v prihodnosti, ki so jo navedli študenti 6. letnika Medicinske fakultete Univerze v Zagrebu, v študijskih letih 2006/07–2011/12.*

Medical specialty/ Medicinska specializacija	N	%
Internal medicine/ Interna medicina	164	14.4
Surgery/Kirurgija	150	13.2
Family medicine/General practice/ Družinska/ splošna medicina	123	10.8
Gynaecology/Ginekologija	92	8.1
Paediatrics/ Pediatrija	87	7.6
Neurology/ Neurologija	40	3.5
Psychiatry/ Psihiatrija	36	3.2
Otorinolaringology/ Otorinolaringologija	32	2.8
Ophthalmology/Oftalmologija	32	2.8
Dermatology/Dermatologija	19	1.7
Radiology/ Radiologija	19	1.7
Public health/ Javno zdravje	10	0.9
Epidemiology/Epidemiologija	8	0.7
Geriatrics/ Geriatrija	1	0.1
Something else*/ Drugo*	86	7.5
Don't know/ Ne vem	241	21.1

*pharmaceutical company (4.4%), science (2.1%), others (1.0%) / *farmacevtska družba (4,4 %), znanost (2,1 %), drugo (1,0 %)

3.2 Results of univariate analysis

Among 899 participants who had already expressed their desire for professional career, there were 123 (13.7%) who opted for family medicine/general practice, 672 (74.7%) who opted for one of the clinical specialties, 18 (2.0%) who opted for one of the public health specialties and 86 (9.6%) who opted for other options. The differences in distribution between different groups of students according to selected characteristics are presented in Table 2. Statistically highly significant differences were found within the categories of gender (females had a higher preference for family medicine than males), desired area of work (those who expressed desire for working as physicians in the countryside had by far the highest preference for family medicine) and desired place of work (those who expressed preparedness to work in the area where they grew up or in other parts of Croatia had much higher preference for family medicine than those who expressed preparedness to work in Zagreb, capital of Croatia) (Table 2). Statistically significant differences were also found in rating of relevance of selected medical school curriculum subjects (those who assigned high or very high relevance to all subjects or at least to clinical and public health subjects and medical ethics had higher preference for family medicine than those who assigned high or very high relevance only to clinical subjects or even to none of the subjects) (Table 2). Close to statistical significance was also accounted for by the difference between years of observation (the overall decreasing trend in frequency of those students who opted for family medicine/general practice was observed, with the exception of the academic year 2010/2011) and in motivation (those students in which internal motivation contributed 50% or more to total motivation for study selection had a higher preference for family medicine than those in which external motivation prevailed) (Table 2). Differences in place of birth and in rating of reputation of family practitioners were not statistically significant.

Table 2. *The distribution of frequency of desired specialties and other employment options in different groups of 899 medical students who have already expressed their desire for professional career participating in the survey performed at the University of Zagreb School of Medicine, in the academic years 2006/07-2011/12.*

Tabela 2. *Porazdelitev pogostosti želenih specializacij in drugih možnosti zaposlitve v različnih skupinah 899 študentov medicine, ki so že izrazili svojo željo glede poklicne kariere in so sodelovali v raziskavi, ki je bila v študijskih letih 2006/2007–2011/12 opravljena na Medicinski fakulteti Univerze v Zagrebu.*

Characteristic/ Karakteristika		Medical specialty/group of specialties/ Medinska specializacija/skupina specializacij				
		Family medicine/ general practice/ Družinska/ splošna medicina	Clinical specialties/ Klinične specializacije	Public health specialties/ Specializacije iz javnega zdravja	Other options/ Druge možnosti	
	N	%	%	%	%	p
Year of observation/ Leto opazovanja	2006/2007	101	21.8	65.3	3.0	9.9	0.081
	2007/2008	134	19.4	73.9	1.5	5.2	
	2008/2009	141	12.1	74.5	2.1	11.3	
	2009/2010	153	11.8	77.1	0.7	10.5	
	2010/2011	158	14.6	74.7	1.3	9.5	
	2011/2012	212	8.0	78.3	3.3	10.4	
Gender/ Spol	Male/ Moški	332	8.4	75.0	3.3	13.3	<0.001
	Female/ Ženski	562	16.7	74.6	1.2	7.5	
Place of birth/ Kraj rojstva	Large city/ Večje mesto	441	12.0	76.6	1.8	9.5	0.688
	Middle sized town/ Srednje veliko mesto	406	15.0	72.9	2.0	10.1	
	Village/ Vas	43	16.3	72.1	4.7	7.0	
Desired area of work/ Želeno področje dela	Physician in the country side/ Zdravnik na podeželju	46	60.9	34.8	2.2	2.2	<0.001
	Medical practitioner in town/ Zdravnik v mestu	183	34.4	60.1	0.0	5.5	
	Hospital doctor/ Bolnišnični zdravnik	609	4.9	84.7	0.8	9.5	
	Other* / Drugo*	54	3.7	48.1	20.4	27.8	
Desired place of work/ Želeni kraj dela	Zagreb	515	8.7	80.6	1.4	9.3	<0.001
	Area where they grew up/ Področje, kjer so odraščali	220	22.3	69.1	1.4	7.3	
	Other parts of Croatia/ Drugi deli Hrvaške	63	33.3	58.7	4.8	3.2	
	Abroad/ Tujina	89	7.9	66.3	4.5	21.3	
% of internal motivation within the total motivation/ % notranje motivacije od celotne motivacije	Less than 50%/ Manj kot 50 %	346	13.0	74.3	0.9	11.8	0.067
	50% or more/ 50 % ali več	546	14.3	74.9	2.7	8.1	

Reputation of family practitioners/ Ugled družinskih zdravnikov	Very low or low/ Zelo nizek ali nizek	458	10.9	77.1	2.0	10.0	0.310
	Medium/ Srednji	352	16.2	73.0	2.3	8.5	
	High or very high/ Visok ali zelo visok	81	18.5	70.4	1.2	9.9	
High relevance assigned to all subjects#/ Velik pomen pripisan vsem predmetom#	No/ Ne	772	13.2	75.3	1.7	9.8	0.038
	Yes/ Da	76	18.4	72.4	5.3	3.9	

Legend/ Legenda: * - researcher, doctor in the laboratory, public health worker, health politician; # - high relevance assigned to all subjects or at least to clinical and public health subjects, and medical ethics/ * - raziskovalec, zdravnik v laboratoriju, delavec v javnem zdravstvu, politik na področju zdravja; # - velik pomen pripisan vsem predmetom ali vsaj predmetom s področja kliničnega in javnega zdravja ter zdravniški etiki.

3.3 Results of multivariate analysis

Summary results of basic logistic regression models of association between intention to specialise in family medicine and each of selected explanatory factors in the group of those participants who opted for family medicine or one of the clinical specialties are presented in Table 3. The results were similar to the results of univariate analysis in gender, place of birth, desired area of work and desired place of work. On the other side, rating of relevance of selected medical school curriculum subjects and motivation to study medicine were no longer significantly associated with observed outcome, while in the year of observation and rating of reputation of family practitioners the situation was the other way around (Table 3).

Table 3. *Summary results of basic logistic regression models of association between intention to specialise in family medicine and each of selected explanatory factors in medical students who have already expressed their desire for professional career participating in the survey performed at the University of Zagreb School of Medicine, in the academic years 2006/07-2011/12.*

Tabela 3. *Povzetek rezultatov osnovnih modelov logistične regresije za ugotavljanje povezave med namero po specializaciji iz družinske medicine in vsakim od izbranih pojasnjevalnih dejavnikov pri študentih medicine, ki so že izrazili svojo željo glede poklicne kariere in so sodelovali v raziskavi, ki je bila v študijskih letih 2006/07–2011/12 opravljena na Medicinski fakulteti Univerze v Zagrebu.*

Explanatory factor/ Pojasnjevalni dejavnik	N		OR/RO	95% C.I. limits for OR Meje 95 % IZ za RV		p	p$_{model}$
				Lower/ Spodnja	Upper/ Zgornja		
Year of observation/ Leto opazovanja	795	2006/2007	1.00				0.011
		2007/2008	0.79	0.41	1.51	0.471	
		2008/2009	0.49	0.24	0.98	0.044	
		2009/2010	0.46	0.23	0.91	0.027	
		2010/2011	0.58	0.30	1.13	0.110	
		2011/2012	0.31	0.15	0.61	0.001	
Gender/ Spol	790	Male/ Moški	1.00				0.003
		Female/ Ženske	2.00	1.27	3.13	0.003	
Place of birth/ Kraj rojstva	786	Large city/ Večje mesto	1.00				0.356
		Middle sized town/ Srednje veliko mesto	1.31	0.88	1.96	0.180	
		Village/ Vas	1.44	0.60	3.44	0.411	

	N		OR/RO	C.I./IZ		p	p
Desired area of work/ Želeno področje dela	791	Hospital doctor/ Bolnišnični zdravnik	1.00				<0.001
		Physician in the country side/ Zdravnik na podeželju	30.10	14.71	61.58	<0.001	
		Medical practitioner in town/ Zdravnik v mestu	9.85	6.09	15.94	<0.001	
		Other*/ Drugo*	1.32	0.30	5.84	0.712	
Desired place of work/ Želeni kraj dela	785	Zagreb	1.00				<0.001
		Area where they grew up/ Področje, kjer so odraščali	2.97	1.91	4.64	<0.001	
		Other parts of Croatia/ Drugi deli Hrvaške	5.23	2.82	9.71	<0.001	
		Abroad/ Tujina	1.09	0.47	2.54	0.834	
% of internal motivation within the total motivation/ % notranje motivacije od celotne motivacije	789	Less than 50%/ Manj kot 50 %	1.00				0.675
		50% or more/ 50 % ali več	1.09	0.73	1.62	0.675	
Reputation of family practitioners/ Ugled družinskih zdravnikov	789	Very low or low/ Zelo nizek ali nizek	1.00				0.046
		Medium/ Srednji	1.57	1.04	2.36	0.033	
		High or very high/ Zelo visok ali visok	1.86	0.98	3.53	0.058	
High relevance assigned to all subjects#/ Velik pomen pripisan vsem predmetom#	752	No/ Ne	1.00				0.243
		Yes/ Da	1.45	0.78	2.70	0.243	

Legend/ Legenda: OR – odds ratio; C.I. – confidence interval; * - researcher, doctor in the laboratory, public health worker, health politician; # - high relevance assigned to all subjects or at least to clinical and public health subjects, and medical ethics/ RO – razmerje obetov; IZ – interval zaupanja; * - raziskovalec, zdravnik v laboratoriju, delavec v javnem zdravstvu, politik na področju zdravja; # - velik pomen pripisan vsem predmetom ali vsaj predmetom s področja kliničnega in javnega zdravja ter zdravniški etiki

Results of full logistic regression model are presented in Table 4. After adjustment for all selected explanatory variables, the relationship between intention to specialise in family medicine and the year of observation remained statistically significant. Even more, it was constantly decreasing (the odds for intention to specialise in family medicine were in the academic year 2006/2007 1.43-times higher than in the year 2007/2008, 1.85-times higher than in the year 2008/2009, 2.38-times higher than in the year 2009/2010, 2.63-times higher than in the year 2010/2011 and 3.85-times higher than in the year 2011/2012). The relationship remained also statistically significant in gender, desired area of work and desired place of work (Table 4).

Table 4. *Results of full logistic regression model of association between intention to specialise in family medicine and all selected explanatory factors in 728 medical students who have already expressed their desire for professional career participating in the survey performed at the University of Zagreb, School of Medicine, in the academic years 2006/07-2011/12.*

Tabela 4. *Rezultati popolnega modela logistične regresije za ugotavljanje povezave med namero po specializaciji iz družinske medicine in vsemi izbranimi pojasnjevalnimi dejavniki pri 728 študentih medicine, ki so že izrazili svojo željo glede poklicne kariere in so sodelovali v raziskavi, ki je bila v študijskih letih 2006/07–2001/12 opravljena na Medicinski fakulteti Univerze v Zagrebu.*

Explanatory factor/ Pojasnjevalni dejavnik		OR/RO	95% C.I. limits for OR Meje 95 % IZ za RV		p
			Lower/ Spodnja	Upper/ Zgornja	
Year of observation/ Leto opazovanja	2006/2007	1.00			
	2007/2008	0.70	0.31	1.63	0.412
	2008/2009	0.54	0.23	1.29	0.168
	2009/2010	0.42	0.18	1.00	0.051
	2010/2011	0.38	0.16	0.90	0.027
	2011/2012	0.26	0.10	0.62	0.003
Gender/ Spol	Male/ Moški	1.00			
	Female/ Ženski	2.30	1.28	4.12	0.005
Place of birth/ Kraj rojstva	Large city/ Večje mesto	1.00			
	Middle sized town/ Srednje veliko mesto	1.05	0.63	1.75	0.854
	Village/ Vas	1.05	0.34	3.24	0.938
Desired area of work/ Želeno področje dela	Hospital doctor/ Bolnišnični zdravnik	1.00			
	Physician in the country side/ Zdravnik na podeželju	29.55	12.33	70.80	<0.001
	Medical practitioner in town/ Zdravnik v mestu	10.14	5.93	17.33	<0.001
	Other*/ Drugo*	1.47	0.31	7.01	0.626
Desired place of work/ Želeni kraj dela	Zagreb	1.00			
	Area where they grew up/ Področje, kjer so odraščali	1.83	1.04	3.23	0.037
	Other parts of Croatia/ Drugi deli Hrvaške	5.51	2.48	12.28	<0.001
	Abroad/ Tujina	1.91	0.72	5.08	0.193
% of internal motivation within the total motivation/ % notranje motivacije od celotne motivacije	Less than 50%/ Manj kot 50 %	1.00			
	50% or more/ 50 % ali več	1.12	0.68	1.86	0.654
Reputation of family practitioners/ Ugled družinskih zdravnikov	Very low or low/ Zelo nizek ali nizek	1.00			
	Medium/ Srednji	1.53	0.92	2.55	0.103
	High or very high/ Visok ali zelo visok	1.18	0.50	2.78	0.705

| High relevance assigned to all subjects#/ Velik pomen pripisan vsem predmetom# | No/ Ne | 1.00 | | | |
| | Yes/ Da | 1.45 | 0.67 | 3.15 | 0.349 |

Legend/ Legenda: OR – odds ratio; C.I. – confidence interval; * - researcher, doctor in the laboratory, public health worker, health politician; # - high relevance assigned to all subjects or at least to clinical and public health subjects, and medical ethics/ RO – razmerje obetov; IZ – interval zaupanja; * - raziskovalec, zdravnik v laboratoriju, delavec v javnem zdravstvu, politik na področju zdravja # - velik pomen pripisan vsem predmetom ali vsaj predmetom s področja kliničnega in javnega zdravja ter zdravniške etike

4 DISCUSSION

The most important result of our study is that Croatia is experiencing a drastically decreasing trend of career choice for family medicine in recent years. This finding is to a certain extent similar to the findings of other similar studies around the world (21-32). Where the reasons for this constant decrease lie is hard to say and in-depth research of this problem is necessary. It is obvious that medical students in Croatia as well as in general are not very interested in working as family practitioners in their future career. The reasons are various. First, in Croatia there is a still present traditional public opinion about the family doctor as the administrator. Second, one cannot neglect the fact that the work of a family practitioner is very difficult, since he/she must often make responsible independent decisions in a short time. In fact, a family medicine practitioner needs to acquire, during the 4-year professional training (in Croatia professional training or specialisation in one of accredited specialties is obligatory for getting the licence to work as a medical doctor), deep knowledge, skills and professional attitudes in a number of areas. As a result, it might be that young people do not feel competent enough to take on such responsible work immediately after finishing their study (41, 42). This could explain the findings of some studies that after students experienced family medicine practice the interest in this specialty declined (4, 17). Third, the medical curriculum in Croatia is still hospital- and not community-oriented. Consequently, students of medicine in Croatia seem to find work in clinical settings more attractive. Along these traditional factors, new factors are arising from the economic and social transition. These factors are not specific only for Croatia but for many countries facing the process of economic and social transition. First, there exists uncertainty about survival on the open labour market for family practitioners (i.e. whether there will be enough people to choose him/her as his/her personal family doctor). Second, there exists uncertainty for family practitioners in their competencies to plan, conduct and manage the clinic in concession such as managing finances, ensuring holiday replacement, replacement during absence from the workplace due to sick-leave, etc. Finally, Croatian society is focused nowadays on the individual rather than the community.

Other important results of our study indicate that career choice in family medicine in Croatia is associated with gender, which is consistent with findings of other similar studies (21, 31), and desired area and desired place of work. Regarding the greater interest in family medicine among young women, it is worth mentioning that the results of several studies indicate an increased interest in specialisations with a controllable life style (less working hours per week spent at work, more free time available for personal activities and family, fewer night shifts, decreased stress and easier admissibility to work for private institutions) (9, 10). Into this cluster of specialisations, dermatology, ophthalmology, radiology, neurology, pathology and psychiatry are usually entered. Family medicine, at least in the way that it is organised in the majority of Croatia, can also be considered as a specialisation with a controllable life style since it largely appreciates the above mentioned characteristics. This could at least partially explain why female students opted for family medicine. Research on gender preference and personality attributes on specialty choice are very interesting (18-20). In fact, for female students, factors such as helping others, empathy, responsibility towards their family and employment certainty are the most important. They choose specialties where there is more contact with people and they make this specialty choice earlier. For their male colleagues, independence, resolution, presumption, income and prestige, academic career and scientific research are more important and they more often choose specialties with technology usage (20, 41). Those who choose surgery or internal medicine are more challenge motivated and they count on career promotion, while those who go for psychiatry and family medicine are more motivated by job diversity and time for their family. On the other side, the multivariate analysis showed that there were no associations with place of birth and motivation to enter the study of medicine that

were found in some other similar studies (17, 24, 25). However, it should be mentioned that this result could be biased by the fact that a large group of students who opted for other employment options (mostly in pharmaceutical companies) was excluded from the multivariate analysis. In the univariate analysis, it was shown that in this very group the external motivation is significantly more expressed than in other groups of students. There was also no association with rating of reputation of family practitioners in those participants who opted for family medicine or one of the clinical specialties. Unfortunately, it appears that influence of the appreciation of family medicine among medical doctors and in the society on choosing the specialisation among medical students has not yet been in the focus of research. Consequently, the results of the present study could not be compared with results of other studies.

The study has one major limitation, being that about 10% of those respondents who have already expressed their desire for professional career (the group which opted for public health specialties and the group which opted for other employment possibilities) were excluded. The decision of exclusion was based on the fact that both groups were rather small, especially the group of students who opted for public health specialties. Consequently, we were not able to use the politomous logistic regression as a method of in-depth analyses. Also, due to their characteristics, neither of these two groups could be combined with the other two groups. Consequently, both groups were excluded from the multivariate analyses

On the other side, this study has several very important strengths. First, it was a population study, covering a majority of a total population of students studying medicine at the biggest medical faculty in Croatia. Since students of the Zagreb School of Medicine represent 60% of all students studying medicine each year in Croatia (Rijeka School of Medicine: 100 students, Split School of Medicine: 50 students, Osijek School of Medicine: 50 students), and since they are coming to study in the capital city from all parts of the country, the results of the present study could be generalised to the whole of Croatia. This is a very important strength because the Zagreb School of Medicine is the only school of medicine that has performed such a study so far in Croatia. Second, as such it provides strong evidence for evidence based public health in the country. Finally, this study is the first one in the region that explores the trend of career choice for family medicine adjusted to several characteristics of the students. As such, it can provide very useful information for countries with similar economic and

political arrangements in the region. This is even more important due to the fact that in the region only a few similar studies have been carried out (43).

The present study has important implications for public health in Croatia. Since Croatian health policy is oriented towards the development of the primary health care, demand for specialists of family medicine will certainly grow in the future. It would be very important to increase awareness among students of medicine that family medicine is an extremely important specialty. However, this will be very hard work to do, since broad reforms of the whole health sector in Croatia are needed to empower family medicine as a discipline and encourage the best students/physicians to choose this specialty. For example, a family medicine specialist should get an important role as the main coordinator in the treatment of an individual patient, while specialists in clinical specialties only the role of family medicine practitioner assistants. This would be a huge step towards reorientation from the selective to comprehensive concept of primary health care (44). Reaching this goal is still a long way off, but small steps can be made today. As a beginning, curricula should for example gradually include more content on professionalism and make students increasingly aware of the concept of social contract (45) and introduce courses like a course on family practice management. But this would be only a drop in the ocean. If Croatia truly wants to make the move to comprehensive primary health care, it will need students who would be dedicated to family medicine early in their medical educational process as well as understand the concept of comprehensive primary health care early. To achieve this, it would be necessary to make some important improvements at the very beginning of the educational process. The most important could be the introduction of assessment of the degree of empathy of candidates for entering medical studies and their communication ability. On the other hand, the authorities could make a kind of "motivation" for career choice for family medicine by supporting and promoting employment in (community oriented) family medicine. An example of practice in this regard is Cuba (46).

Although a lot of research has been already done in the field, there is still a lot of work to do. Especially quantitative data should be combined with qualitative analysis for a more complete understanding of graduating students' career decisions, particularly why they choose (or not) family medicine as future professional work. Since the countries in the region are expressing an interest for cooperation in the field of public health education and research (47), this topic would be very important to be explored in more detail.

5 CONCLUSIONS

We can conclude that the results of the present study offer evidence that Croatia is experiencing a constantly decreasing trend of career choice for family medicine in recent years. It is obvious that final year medical students are not very much interested in working as family practitioners. At the same time, demand for family practitioners in Croatia is increasing. Both academic and professional societies have a social responsibility to reorient the health care systems and medical curricula towards comprehensive primary health care in which family medicine has a key role.

References

1. World Health Organization. Making medical practice and education more relevant to people's needs: the contribution of the family doctor. Geneva: World Health Organization, 1994.
2. World Health Organization. Preparing a health care workforce for the 21st century: the challenge of chronic conditions. Geneva: World Health Organization, 2005.
3. Pruitt SD, Epping-Jordan JE. Preparing the 21st century global healthcare workforce. BMJ 2005; 330: 637.
4. Schafer S, Shore W, Hearst N. Is medical school the right place to choose a specialty? JAMA 2001; 21: 2782-3.
5. Saigal P, Takemura Y, Nishiue T, Fetters MD. Factors considered by medical students when formulating their specialty preferences in Japan: findings from a qualitative study. BMC Med Educ 2007; 7: 31.
6. Gorenflo DW, Ruffin MT 4th, Sheets KJ. A multivariate model for specialty preference by medical students. J Fam Pract 1994; 6: 570-6.
7. Khader Y, Al-Zoubi D, Amarin Z, Alkafagei A, Khasawneh M, Burgan S et al. Factors affecting medical students in formulating their speciality preferences in Jordan. BMC Med Educ 2008; 8: 32.
8. Dikici MF, Yaris F, Topsever P, Tuncay Muge F, Gurel FS, Cubukcu M et al. Factors affecting choice of specialty among first-year medical students of four universities in different regions of Turkey. Croat Med J 2008; 49: 415-20.
9. Dorsey ER, Jarjoura D, Rutecki G. Influence of controllable lifestyle on recent trends in specialty choice by US medical students. JAMA 2003; 290: 1173-8.
10. Newton R. What predicts medical student career choice? J Gen Intern Med 1998; 13: 200-3.
11. Kassebaum S. Medical students' career indecision and specialty rejection: roads not taken. Acad Med 1995; 70: 937-43.
12. Senf JH, Campos-Outcalt d, Watkins AJ, Bastacky S, Lillian S. A systematic analysis of how medical school characteristics relate to graduates' choice of primary care specialties. Acad Med 1997; 72: 524-33.
13. Meurer LN. Influence of medical school curriculum on primary care specialty choice: analyses and synthesis of literature. Acad Med 1995; 70: 388-97.
14. Steiner E, Stoken JM. Overcoming barriers to generalism in medicine: the residents' perspective. Acad Med 1995; 70 (Suppl 1): 94.
15. Mutha S, Takayama JI, O'Neil EH. Insights into medical students' career choices based on third- and fourth-year students' focus group discussions. Acad Med 1997; 72: 635-40.
16. Bland CJ, Meurer LN, Maldonado G. Determinants of primary care specialty choice: a non-statistical eta-analysis of the literature. Acad Med 1995; 70: 620-41.
17. Kassebaum DG, Szenas PL, Schuchert MK. Determinants of the generalist career intentions of 1995 graduating medical students. Acad Med 1996; 71: 198-209.
18. Dorsey J. The influence of controllable lifestyle and sex on the specialty choices of graduating U.S. medical students, 1996-2003. Acad Med 2005; 9: 791-6.
19. Vaglum P, Wiers-Jenssen J, Ekeberg O. Motivation for medical school: the relationship to gender and specialty preferences in a nationwide sample. Med Educ 1999; 4: 236-42.
20. Buddeberg-Fischer B, Klaghofer R, Abel T, Buddeberg C. The influence of gender and personality traits on the career planning of Swiss medical students. Swiss Med Wkly 2003; 39/40: 535-40.
21. Wright B, Scott I, Woloschuk W, Brenneis F. Career choice of new medical students at three canadian universities: family medicine versus specialty medicine. CMAJ 2004; 170: 1920-4.
22. Lambert TW, Goldacre MJ, Turner G. Career choices of United Kingdom medical graduates of 2002: questionnaire survey. Med Educ 2006; 40: 514-21.
23. Svirko E, Goldacre MJ, Lambert T. Career choice of the United Kingdom medical graduates of 2005, 2008 and 2009: questionnaire surveys. Med Teach 2013; 35: 365-75.
24. Senf JH, Campos-Outcalt D, Kubot R. Factors related to the choice of family medicine: a reassessment and literature review. J Am Booard Fam Pract 2003; 16: 502-12.
25. Lambert T, Goldacre M. Trends in doctors' early career choices for general practice in the UK: longitudinal questionnaire surveys. Br J Gen Pract 2011; 61: e397-403.
26. National Institute of Public Health. Croatian health service yearbook. Zagreb: NIPH, 2012.
27. Scott I, Gowans M, Wrigjt B, Brenneis F, Banner S, Boone J. Determinants of choosing a career in family medicine. CMAJ 2011; 183: 1E1-E8.
28. Newton DA, Grayson MS, Thompson LF. The variable influence of lifestyle and income on medical students' career specialty choices: data from two U.S. medical schools, 1998-2004. Acad Med 2005; 80: 809-14.
29. Scott IM, Wright BJ, Brenneis FR, Gowans MC. Whether or wither some specialties: a survey of Canadian medical student career interest. BMC Med Educ 2009; 9: 57.
30. Geoffrey A, Goldsmith GA. Interest in family medicine: 1982 revisited? Fam Med 2004; 36: 447-8.
31. Campos-Outcalt D, Senf J, Pugno PA, McGaha AL. Family medicine specialty selection: a proposed research agenda. Fam Med 2007; 39: 585-9.
32. Pugno PA, McGaha AL, Schmittling GT, DeVilbiss Bieck AD, Crosley PW et al. Results of the 2010 National Resident Matching Program: family medicine. Fam Med 2010; 42: 552-61.
33. World Health Organization. Primary health care – now more than ever: the world health report 2008. Geneva: World Health Organization, 2008.
34. Oreskovic S. New priorities for health sector reform in Central and Eastern Europe. Croat Med J 1998; 39: 225-33.
35. Katić M, Juresa V, Oresković S. Family medicine in Croatia: past, present, and forthcoming challenges. Croat Med J 2004; 45: 543-9.
36. Bardehle D, Laaser U, Zaletel-Kragelj L. Selected indicators of health care resources, and health care utilization and costs in countries of the "Public health in South Eastern Europe (PH-SEE)" network. Zdrav Var 2006; 45: 67-80.
37. Oleszczyk M, Švab I, Seifert B, Krzton-Krolewiecka A, Windak A. Family medicine in post-communist Europe needs a boost: exploring the position of family medicine in healthcare systems of Central and Eastern Europe and Russia. BMC Fam Pract 2012; 3: 15.

38. Seifert B, Svab I, Madis T, Kersnik J, Windak A, Steflova A et al. Perspectives of family medicine in Central and Eastern Europe. Fam Pract 2008; 25: 113-8.

39. Hebrang A, Henigsberg N, Erdeljic V, Foro S, Vidjak V, Grga A et al. Privatization in the health care system of Croatia: effects on general practice accessibility. Health Policy Plan 2003; 18: 421-8.

40. Polašek O, Kolčić I, Čikeš N. Specialty preferences among final-year medical students at Zagreb University Medical School [in Croatian]. Liječ Vjesn 2007; 129: 118-23.

41. Schafer S, Shore W, French L, Tovar J, Hughes S, Hearst N. Rejecting family practice: why medical students switch to other specialties. Fam Med 2000; 32: 320-5.

42. Buddeberg-Fischer B, Klaghofer R, Abel T, Buddeberg C. Swiss residents' specialty choices--impact of gender, personality traits, career motivation and life goals. BMC Health Serv Res 2006; 6: 137.

43. Švab I, Petek Šter M. Long-term evaluation of undergraduate family medicine curriculum in Slovenia. Srb Arh Cel Lek 2008; 136: 274-9.

44. Baum F. Health for all now! Reviving the spirit of Alma Ata in the twenty-first century: an introduction to the Alma Ata declaration. Soc Med 2007; 2: 34-41.

45. Cruess RL, Cruess SR. Expectations and obligations: professionalism and medicine›s social contract with society. Perspect Biol Med 2008; 51: 579-98.

46. Dresang LT, Brebrick L, Murray D, Shallue A, Sullivan-Vedder L. Family medicine in Cuba: community-oriented primary care and complementary and alternative medicine. J Am Board Fam Pract 2005; 18: 297-303.

47. Zaletel-Kragelj L, Kovačić L, Bjegović V, Božikov J, Burazeri G, Donev D et al. The use and exchange of teaching modules published in the series of handbooks prepared within the frame of the «Forum for public health in South-Eastern Europe» network. Zdrav Var 2012; 51: 237-50.

OBRAVNAVA IZBRUHA STAFILOKOKNE ZASTRUPITVE S HRANO V OSNOVNI ŠOLI

MANAGING OF THE OUTBREAK OF STAPHYLOCOCCAL FOOD POISONING IN PRIMARY SCHOOL

Irena Grmek Košnik[1], Andreja Krt Lah[1], Urška Dermota[1], Tatjana Frelih[2]

Izvleček

Izhodišče: Oktobra 2010 smo imeli na Gorenjskem v eni izmed osnovnih šol z vrtcem izbruh stafilokokne zastrupitve s hrano.

Metode: Izvedli smo retrospektivno kohortno epidemiološko raziskavo in izračunali stopnjo obolevnosti v izbruhu ter relativno tveganje (RT) za vsako živilo. Pri obolelih smo kultivirali blato in izbruhanino. Opravili smo terenski ogled z odvzemom vzorca hrane, brisov delovnih površin na snažnost in brisa rok zaposlenih v kuhinji. V okviru usmerjenega pregleda smo trem zaposlenim v kuhinji odvzeli kužnine za mikrobiološke preiskave. Izolatom bakterije Staphylococcus aureus smo določili enterotoksine s testom aglutinacije SET RPLA (Oxoid). Za primerjavo sorodnosti bakterije S. aureus iz živila in humanih vzorcev smo opravili tipizacijo izolatov s pulzno elektroforezo (PFGE).

Rezultati: Obolelo je 73 oseb od 374 izpostavljenih. Stopnja obolevnosti je bila 19,5-odstotna. Najpogostejši bolezenski znaki so bili: bruhanje (87,7 %), bolečine v trebuhu (75,3 %), driska (64,2 %) in slabost (59,3 %). Največje relativno tveganje (RT) za zastrupitev je bilo povezano z uživanjem mesnega sira (RT= 24,2 (95 % CI 12,1–48,5; p<0,001) in krompirjeve solate (RT= 19,4 (95 % CI 10,7–35,2; p<0,001). S kože rok osebe, zaposlene v kuhinji, iz vzorca hrane in kužnin obolelih otrok smo izolirali bakterijo S. aureus, ki je izločala enterotoksina A; po občutljivosti za antibiotike se ni razlikovala od drugih; z metodo PFGE se je pokazala 96,3-odstotna sorodnost med sevi.

Zaključki: Opisana raziskava je vzorčen primer dela in ukrepanja področnega epidemiologa in mikrobiologa ob pojavu izbruha. V izbruhu smo dokazali epidemiološko povezane izolate in opredelili pomen posameznih preiskav.

Ključne besede: Staphylococcus aureus, zastrupitev s hrano, stafilokokni enterotoksini, klicenosci, tipizacija, pulzna elektroforeza

Abstract

Background: In October 2010 an outbreak of staphylococcal food poisoning occurred in an elementary school with a kindergarten in Gorenjska.

Methods: Using a questionnaire we performed a retrospective cohortanalytical epidemiological study. We calculated attack rate (AR) and relative risk for each food item. In patients we cultivated stools and vomit. We performed an onsite audit where the food samples, environmental samples, and swabs of the hands of the cooks were taken. We performed medical examination of those employed in the kitchen where specimens were taken for microbiological examination. Staphylococcal enterotoxins were detected with agglutination test SET RPLA (Oxoid) and genotypes determined by the pulsed-field gel electrophoresis (PFGE).

Results: Out of 374 exposed 73 subjects got ill. Attack rate in the outbreak was 19,5 %. The most frequent symptoms were vomiting (87,7 %), stomach ache (75,3 %), diarrhea (64,2 %) and nausea (59,3 %). The highest relative risk (RR) were found for the meatloaf (RR= 24,2 (95 % CI 12,1-48,5; p<0,001)) and potato salad (RR= 19,4 (95 % CI 10,7 – 35,2; p<0,001)). Enterotoxin A producing S. aureus was isolated from hand of a cook, from potato salad and meatlof, from vomit and stools of patients. These strains had the same antibiotic sensitivity and were genetically closely related (96,3 %).

[1]Zavod za zdravstveno varstvo Kranj, Gosposvetska 12, 4000 Kranj, Slovenija
[2]Inštitut za varovanje zdravja Republike Slovenije, Trubarjeva 2, 1000 Ljubljana, Slovenija
 Kontaktni naslov: e-pošta: irena.grmek-kosnik@zzv-kr.si

Conclusions: *In the article an optimal team approaches of a community epidemiologist and microbiologist in the occasion of outbreak are described. We confirmed epidemiologically related isolates and determined the importance of individual methods.*

1 UVOD

Stafilokokna zastrupitev s hrano je posledica zaužitja enterotoksinov (ET) bakterije *Staphylococcus aureus*. Po navadi poteka kot izbruh; to je hkraten pojav bolezni pri več ljudeh na določeni lokaciji v danem časovnem obdobju, ki odstopa od običajnega obolevanja, pri čemer ni pomembna množičnost pojava. Ko se pojavi izbruh, je najpomembnejši cilj ugotoviti njegov izvor, ga odstraniti in tako nadzorovati njegov potek (1–3). Najpogostejše opredeljene črevesne nalezljive bolezni v zadnjih10 letih so salmoneloze, rotaviroze in kampilobakterioze. V letu 2010 je bilo vseh prijavljenih črevesnih nalezljivih bolezni 20.373, od tega kar 70 % neopredeljene etiologije. Od etiološko pojasnjenih črevesnih nalezljivih bolezni je bilo 1.593 rotavirusnih okužb, 999 kampliobakterioz, 347 salmoneloz. Glede na podatke letnih poročil o epidemiološkem spremljanju nalezljivih bolezni v Sloveniji sta bila v letu 2010 prijavljena dva izbruha stafilokokne zastrupitve s hrano oziroma je obolelo 84 oseb (4).

Enterotoksin deluje na osrednje živčevje, kjer vzburi nervus vagus. Stafilokokni ET povzročijo izrazito izgubo vode v prebavila; posledici tega sta bruhanje in driska. Do danes je opisanih že več kot 20 vrst toksinov: od ET A do ET E ter novi ET C do ET IX. Vsi imajo superantigensko aktivnost, polovica od njih tudi emetsko (5–10). ET so termostabilni in jih s kuhanjem hrane ne uničimo. Odporni so tudi proti kislinam in proteolitičnim encimom. Enterotoksini bakterije *S. aureus* so razen pri zastrupitvi s hrano pomembni tudi v patogenezi okužb (11, 12).

Posamezen sev lahko izloča enega ali več toksinov hkrati (13–14). Večina zastrupitev s hrano je posledica zastrupitve z ET A. Izsledki študij na živalih kažejo, da ima ET A močno superantigenski in emetski potencial brez učinka driske (15).

Izvor epidemije stafilokokne zastrupitve je običajno hrana. Hrano kontaminira človek, ki jo pripravlja, če je klicenosec ali ima stafilokokno okužbo. Izvor okužbe so lahko tudi krave, psi in perutnina. V živilih se stafilokoki razmnožujejo pri temperaturi od 10 do 45°C. V gramu hrane je lahko že v nekaj urah 10^5–10^9 bakterij. Največkrat kontaminirana živila so slanina, solate, majoneza, perutnina, kreme, mlečni proizvodi, sladoledi in slaščice. Kontaminirana živila imajo normalen videz, vonj in okus (1, 3, 15).

Interval med zaužitjem hrane in začetkom simptomov je od 30 minut do 8 ur. Bolezen se začne naglo s slabostjo, z bruhanjem in drisko. Iztrebki so tekoči brez primesi sluzi ali krvi. Bolezen spremljajo bolečine v trebuhu, slinjenje in glavobol. Večina bolnikov nima vročine. Pri zelo mladih in starih osebah se lahko razvije huda dehidracija. Bolezen traja od 24 do 48 ur (1, 3, 8).

Diagnozo stafilokokne zastrupitve s hrano potrdimo z dokazom ET ali več kot 10^5 kolonij stafilokokov v gramu hrane. Če se hrana pogreva, stafilokoki propadejo in jih ne moremo izolirati, lahko pa jih ugotovimo z barvanjem vzorcev hrane po Gramu (1–7).

1.1 Namen in cilji raziskave

V torek, 5.10.2010, ob 15.20 smo po telefonu prejeli obvestilo o bruhanju 30 varovancev vrtca in štirih zaposlenih vzgojiteljic v eni izmed osnovnih šol z vrtcem na Gorenjskem. Glede na bolezenske znake in množičen začetek težav kmalu po kosilu smo posumili, da je izbruh verjetno posledica okužbe iz skupnega vira in vezan na kosilo v šoli. Postavili smo hipotezo, da je šlo najverjetneje za zastrupitev s hrano, ki so jo zaužili za kosilo.

Namen epidemiološke raziskave je bil ugotoviti vzrok izbruha, ali je bila hrana vzrok za izbruh, katera hrana, kje je bil izvor izbruha, potrditi morebitno zastrupitev pri obolelih, ugotoviti dejavnike, ki so povzročili izbruh,in prikazati preventivne ukrepe, da bi se izognili podobnim primerom v prihodnje. Cilj raziskave je bil ugotoviti, ali z epidemiološko raziskavo, laboratorijskimi preiskavami, okoljskimi raziskavami in z usmerjenim pregledom zaposlenih, ki delajo z živili, pridemo do enakih zaključkov oziroma opredeliti pomen vsake metode posebej.

2 MATERIAL IN METODE

V preiskavi izbruha smo izvedli: epidemiološko raziskavo, laboratorijske preiskave, okoljsko raziskavo in usmerjen pregled zaposlenih, ki delajo z živili.

2.1 Epidemiološka kohortna raziskava

Prvi primer bruhanja otroka je bil 5. 10.2010 ob 14.30 v vrtčevski enoti omenjene osnovne šole. V ospredju

klinične slike je bilo pri vseh obolelih bruhanje, nekateri pa so imeli tudi drisko in krče v trebuhu. O izbruhu smo obvestili zdravstveno službo v omenjenem kraju in jih prosili za pomoč pri zbiranju kužnin obolelih.

Epidemiološko poizvedovanje smo začeli takoj po pridobitvi informacije o izbruhu, da bi ugotovili število obolelih v izbruhu, vir in potek izbruha. Hkrati s preiskavo smo priporočili takojšnje ukrepe za preprečevanje nadaljnjega širjenja morebitnega črevesnega nalezljivega obolenja.

Naslednji dan smo s pomočjo vprašalnika izvedli retrospektivno kohortno epidemiološko raziskavo. Z vprašalnikom smo zbirali podatke o spolu, starosti, zdravstvenem stanju oz. o pojavu bolezenskih znakov: slabo počutje, slabost, glavobol, bolečine v trebuhu, bruhanje, povišana telesna temperatura, driska, drugo in tudi o vrsti zaužite hrane.

Kot primer v izbruhu smo opredelili osebo, ki je bila 5.10. 2010 v šoli/vrtcu in je bruhala in/ali imela drisko. V raziskavo smo vključili vse otroke in zaposlene v vrtcu in osnovni šoli. Vprašalnik je bil razdeljen vsem skrbnikom predšolskih in šolskih otrok ter zaposlenim v vrtcu in osnovni šoli. Vprašalnike so izpolnjevali: vzgojiteljice, starši otrok, večji otroci in zaposleni. Podatke iz vrnjenih vprašalnikov smo vnesli in obdelali s pomočjo programa Epi Info 3.3. Izračunali smo stopnjo obolevnosti v izbruhu in relativno tveganje (RT) za vsako živilo. Statistično značilno povezanost med obolenjem in zaužitjem določenih živil smo potrdili s Fisherjevim eksaktnim testom (FET).

2.2   Laboratorijske raziskave

Štirim obolelim otrokom, ki so poiskali zdravniško pomoč, so po našem predhodnem posredovanju odvzeli izbruhanino in/ali blato za preiskavo na patogene črevesne bakterije in viruse. Kužnine smo analizirali v Laboratoriju za medicinsko mikrobiologijo na Zavodu za zdravstveno varstvo Kranj (ZZV Kranj). Kužnine smo pregledali na prisotnost salmonel, šigel, kampilobaktrov, jersinij, patogenih *E. coli, S. aureus* ter tudi rotavirusov, adenovirusov in norovirusov. Identifikacijo bakterije *S. aureus* smo izvedli po standardnih mikrobioloških postopkih (2). Za testiranje občutljivosti stafilokokov smo uporabili modificirano Kirby-Bauerjevo metodo difuzije v agarju z diski – difuzijski antibiogram po navodilih CLSI –*Performance Standards for Antimicrobial Susceptibility Testing* (16). Kot pomoč pri biotipizaciji bakterije *S. aureus* smo izolate iz kužnin bolnikov, zaposlenih in iz živila testirali na 12 antibiotikov: penicilin, oksacilin, tetraciklin, linezolid, eritromicin, klindamicin, kloramfenikol, rifampin, gentamicin, ciprofloksacin, teikoplanin, trimetoprim sulfametoksazol.

Vse izolate bakterije *Staphylococcus aureus* smo preiskali in ugotavljali, ali proizvajajo ET. Uporabili smo test SET-RPLA (Staphylococcal enterotoksin test kit, OXOID). Pri tem testu je na polistirenskih lateksnih delcih vezan antiserum kuncev, imuniziranih z očiščenimi ET A, B, C in D. V prisotnosti ustreznega ET lateksni delci aglutinirajo. Metoda omogoča ugotavljanje toksinov A, B, C in D neposredno v hrani in iz bujonske kulture izolirane bakterije. Test je semikvantitativen. Občutljivost testa je do 1,0 ng/g v hrani in do 0,5 ng/ml v bujonski kulturi.

Za primerjavo sorodnosti bakterije *Staphylococcus aureus* iz živila in humanih vzorcev so v Bolnišnici Golnik v Laboratoriju za respiratorno mikrobiologijo opravili pulzno elektroforezo (PFGE) (17).

2.3   Okoljske raziskave

Terenski ogled z odvzemom kužnin
Sanitarno-higienski pregled smo opravili 6. 10. 2010 v sodelovanju z Oddelkom za higieno ZZV Kranj in OE ZIRS.

2.4   Usmerjen pregled zaposlenih, ki delajo za živili

Usmerjen pregled treh zaposlenih v kuhinji, ki so 5. 10. 2013 delali z živili, smo izvedli v ambulanti ZZV Kranj, in sicer 7. 10. 2010. Eden izmed zaposlenih je bil tudi oboleli v izbruhu.

2.5   Komunikacija z mediji

Že naslednje jutro, 6. 10. 2010, so se z vprašanji o izbruhu na nas obrnili različni mediji, ki so jih spodbudili starši obolelih otrok.

2.6   Javnozdravstveni ukrepi

Osebju kuhinje smo začasno svetovali pripravljati prilagojene jedilnike. Vsem zaposlenim v kuhinji šole sta bila odrejena zdravstveni pregled in 3-urno izobraževanje HACCP. Glede na laboratorijske izvide smo eni osebi omejili delo z živili. Pregledali smo njihova zdravstveno-higienska navodila in jim svetovali nekaj popravkov.

3 REZULTATI

3.1   Rezultati epidemiološke raziskave

V osnovni šoli je bilo 5. oktobra 2010 160 varovancev vrtca, 316 šolarjev in 75 zaposlenih. Od 551 poslanih vprašalnikov smo dobili vrnjenih 374 (67,9-odstotna

stopnja odgovora). Odgovorilo je 222 oseb ženskega spola (59,4 %) in 152 oseb moškega spola (40,6 %). Starostna struktura anketiranih, ki so vrnili vprašalnik, je prikazana v tabeli 1. Otrok, starih 0–6 let, je bilo 24,9 %, otrok, starih 7–14 let, 59,4 %. Glede na strukturo je bilo anketiranih otrok iz vrtca 17,1 %, šolarjev 66,6 % in zaposlenih 16,3 %.

Tabela 1. *Starostne skupine anketiranih oseb.*
Table 1.   *Respondent age group.*

Starostna skupina/ Age group	Število/ Number	Delež (%)/ Proportion (%)
0-3	38	10,2
4-6	55	14,7
7-14	222	59,4
20-29	13	3,5
30-39	15	4,0
40-49	19	5,1
50-59	11	2,9
60-69	1	0,3
Skupaj/ Total	374	100,0

Stopnja obolevnosti v izbruhu (AR)
Skupaj je zbolelo 73 oseb, od tega največ (61) 5.10.2010, štiri osebe so kot datum začetka obolenja navedle 6.10.2010, osem obolelih pa ni navedlo datuma o začetku obolenja. Ker anketiranci povečini niso odgovorili na vprašanje glede ure začetka bolezenskih znakov, ni bilo mogoče izdelati epidemijske krivulje. Kosilo so začeli deliti po 11. uri; prva oseba je obolela ob 14.30, temu primeru pa je še isti dan sledila večina primerov. Tako lahko govorimo o nekajurni inkubacijski dobi. Stopnja obolevnosti v izbruhu je bila 19,5-odstotna. Med obolelimi je bilo 38 moških (52,1 %) in 35 žensk (47,9 %). Obolevnost po starostnih skupinah prikazuje Slika 1.
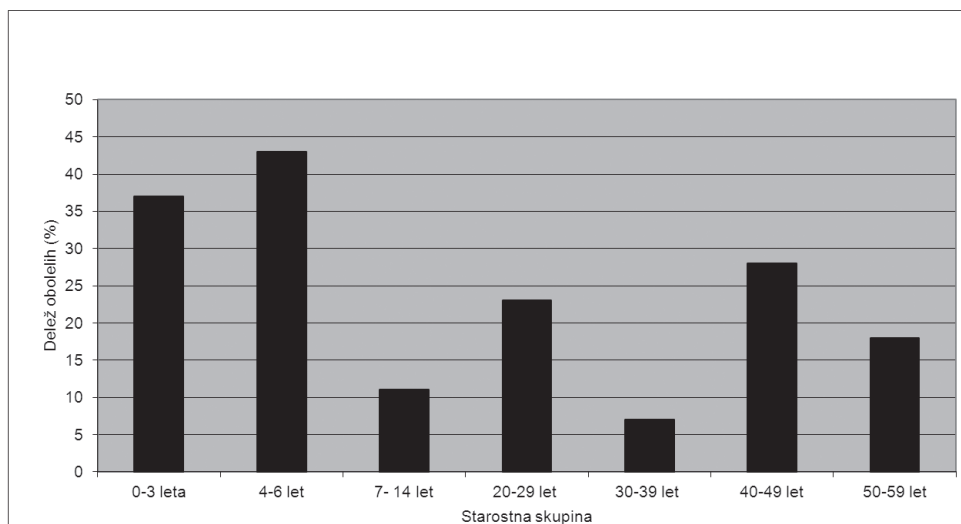
Slika 1.   *Deleži obolelih v izbruhu po starostnih skupinah.*
Figure 1. *Attack rate by age group.*

Posamezni oboleli so iskali zdravniško pomoč. Povečini je zadoščal telefonski posvet z zdravnikom. Pri zdravniku se je oglasilo pet oseb. Nihče izmed obolelih ni bil sprejet v bolnišnico.
Najpogostejši bolezenski znaki so bili: bruhanje (87,7 % obolelih), bolečine v trebuhu (75,3 %), driska (64,2 %),

slabost (59,3 %), slabo počutje (46,0 %), glavobol (23,9 %) in povišana telesna temperatura $\geq$ 37 ^{0}C (10,1 %).
V retrospektivni kohortni raziskavi smo ugotavljali, kako močno sta povezana uživanje določenih živil in obolenje. Najvišje relativno tveganje (RT) je bilo

povezano z uživanjem mesnega sira – RT= 24,2 (95 % CI 12,1–48,5) in krompirjeve solate RT= 19,4 (95 % CI 10,7–35,2). Statistično značilno povezanost smo potrdili s testom χ² (FET). Na podlagi izsledkov

lahko s 95-odstotno verjetnostjo (p-vrednost < 0,001) trdimo, daje bila obolevnost med otroki v vrtcu, šolarji in zaposlenimi v OŠ povezana z uživanjem krompirjeve solate in mesnega sira.

Tabela 2. *Delež obolelih v izbruhu; RT, povezan z uživanjem različnih živil.*
Table 2.   *Food-specific attack rates and RR.*

Živilo/ Foodstuff	Jedli/pili/ Ate/drank				Niso jedli/pili/ Did not eat/ drink				RT (RR)	95% CI
	Bolni/ Ill	Zdravi/ Healthy	Skupaj/ Together	AR (%)	Bolni/ Ill	Zdravi/ Healthy	Skupaj/ Together	AR (%)		
Čaj/ Tea	51	131	182	28	22	170	192	11	2,4	1,5-3,8
Črna žemlja/ Brown bread	19	18	37	57	54	283	337	16	3,2	2,2-4,8
Krompirjeva solata/ Potato salad	62	22	84	74	11	279	290	3,8	19,4	10,7-35,2
Sadni sok/ Fruit juice	24	15	39	62	49	286	335	15	4,2	2,9-6,0
Ovseni kruh/ Oat bread	53	150	203	26	20	151	171	12	2,2	1,4-3,6
Pečen mesni sir/ Grilled meatloaf	65	29	94	69	8	272	280	3	24,2	12,1-48,5
Polenta z mlekom/ Cornmeal mush with milk	20	12	32	63	53	289	342	16	4,0	2,8-5,8
Rezine sveže paprike/ Paprica	39	93	132	30	34	208	242	14	2,1	1,4-3,2
Sadje/ Fruit	42	28	70	60	31	273	304	10	5,9	4,0-8,6
Špargljeva juha/ Asparagus soup	23	19	42	55	50	282	332	15	3,6	2,5-5,3
Turistična pašteta/ Fish spread	46	145	191	24	27	156	183	15	1,6	1,0-2,5
Vodovodna voda/ Tape water	57	219	276	21	16	82	98	16	1,3	0,7-2,1

Stopnja obolevnosti je bila najvišja med tistimi, ki so jedli krompirjevo solato (74 %), in tistimi, ki so jedli pečen mesni sir (69 %), ter najmanjša med tistimi, ki teh živil niso jedli (3,8 % obolelih ni jedlo krompirjeve solate, 3 % obolelih niso jedli pečenega mesnega sira). Tudi v multivariatni analizi smo kot dejavnik tveganja prepoznali uživanje pečenega mesnega sira – RT= 16,8 (95 % CI 58,8; p< 0,001) in krompirjeve solate – RT= 11,6 (95 % CI 40,8, p< 0,001).

3.2   Rezultati laboratorijskih preiskav

Iz vseh štirih kužnin (1 otrok izbruhanina, 3 otroci blato) obolelih smo izolirali bakterijo *S. aureus*. Izolat *S. aureus* iz izbruhanine in dveh blat so izločali enterotoksina A.

Tudi iz vzorca hrane (mesni sir in krompirjeva solata, 5.10.2010, shranjena v isti posodi) so v Laboratoriju za sanitarno mikrobiologijo IVZ RS izolirali bakterijo *Staphylococcus aureus*, ki je izločala enterotoksin A. Brisi na snažnost in brisi rok zaposlenih, odvzeti na terenskem ogledu, so bili negativni. Iz brisov nosu, žrel, rok vseh treh zaposlenih, odvzetih na usmerjenem pregledu, smo izolirali bakterijo *S. aureus.* Izolat *S. aureus* s kože rok le ene zaposlene je izločal enterotoksina A, iz nosu iste zaposlene enterotoksin C. Izolati bakterije *S. aureus* iz hrane, iz kužnin obolelih in izolat s kože rok zaposlene se po občutljivosti za antibiotike niso razlikovali (tabela 3). Drugih patogenih bakterij in tudi virusov nismo zaznali.

Tabela 3. *Izolati S. aureus iz vzorcev, odvzetih v epidemiji, njihovi enterotoksini, odpornost proti antibiotikom in genotipi.*

Table 3. *S.aureus isolates from samples taken in the epidemics, their enterotoxins, antibiotic resistance and genotypes.*

	Vzorec/ Sample	Enterotoksin/ Enterotoxin	Odporen proti antibiotiku/ Antibiotic resistance	Genotip/ Genotype
1	Prva zaposlena oseba v kuhinji bris žrela/ 1st person in kitchen swab throat	Neg.	P	a
2	Prva zaposlena oseba v kuhinji bris rane na roki/ 1st person in kitchen swab wound on hand	Neg.	P	a
3	Druga zaposlena oseba v kuhinji bris nosu/ 2nd person in kitchen swab nose	Neg.	P	a
4	Druga zaposlena oseba v kuhinji bris rane na roki/ 2nd person in kitchen swab wound on hand	Neg.	P	a
5	Tretja zaposlena oseba v kuhinji bris nosu/ 3rd person in kitchen swab nose	C	P	b
6	Tretja zaposlena oseba v kuhinji bris rane na roki/ 3rd person in kitchen swab wound on hand	A	P	c
7	Pečen mesni sir in krompirjeva solata/ Grilled meatloaf and potato salad	A	P	c
8	Oboleli otrok 1 izbruhanina/ Patient 1 vomit	A	/	c
9	Oboleli otrok 2 blato/ Patient 2 stool	A	/	c
10	Oboleli otrok 3 blato/ Patient 3 stool	A	/	c
11	Oboleli otrok 4 blato / Patient 4 stool	Neg.	/	/

Legenda/ Legend: P-penicilin

Z metodo elektroforeze v pulzirajočem polju (PFGE) smo ugotovili 96,3-odstotno sorodnost med sevi bakterije *S. aureus* s kože rok tretje zaposlene osebe v kuhinji, sevom *S. aureus* iz živila ter osamljenimi sevi iz kužnin obolelih otrok – genotip C (Slika 2).
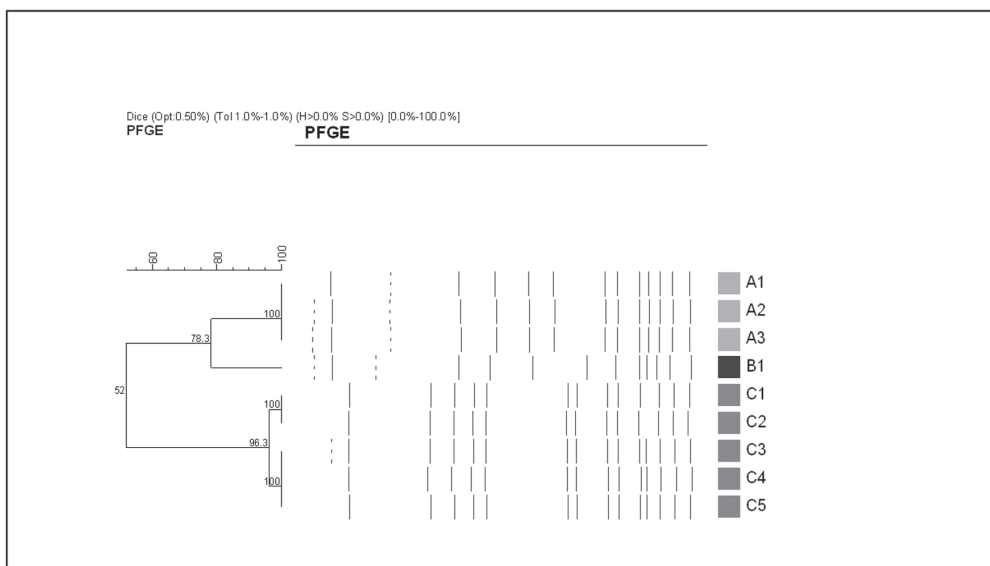
Slika 2.   Rezultati PFGE.
Figure 2. PFGE results.

Legenda/ Legend:

A1 - Prva zaposlena oseba bris žrela/ 1st person in kitchen swab throat
A2 - Prva zaposlena oseba bris rane na roki/ 1st person in kitchen swab wound on hand
A3 - Druga zaposlena oseba bris nosu/ 2nd person in kitchen swab nose
B1 - Tretja zaposlena oseba bris nosu/ 3rd person in kitchen swab nose
C1 - Oboleli otrok 1 izbruhanina/ Patient 1 vomit
C2 - Tretja zaposlena oseba bris rane na roki/ 3rd person in kitchen swab wound on hand
C3 - Živilo – krompirjeva solata/mesni sir/ Food - Potato salad/ Grilled meatloaf
C4 - Oboleli otrok 2 blato/ Patient 2 stool
C5 - Oboleli otrok 3 blato/ Patient 3 stool

3.3   Rezultati okoljskih raziskav

Rezultati terenskega ogleda z odvzemom kužnin
Kuhinja je bila videti urejena; zaposleni so povedali, da imajo vzpostavljen sistem HACCP. V kuhinji so na dan pregleda pripravili 270 malic in 100 kosil, izdelujejo tudi več dietnih jedilnikov.
Med razgovorom z zaposlenimi smo ugotovili, da so bile na dan zastrupitve v kuhinji zaposlene štiri osebe, dva kuharja in dve pomočnici. Kuhar je bil kronični bolnik in invalid III. kategorije. 5. in 6. 10. 2010 so delale v kuhinji tri osebe, ena od pomočnic je bila zaradi bolezni odsotna. Kljub temu niso spremenili jedilnika (tabela 4), ampak so že en dan prej skuhali krompir, ga ohladili s hladno vodo, olupili in do naslednjega dne pustili stati na sobni temperaturi v koritu. Naslednje jutro so krompirju dodali polivko in ga premešali z rokami.

Tabela 4. *Jedilnik dne 5. 10. 2010.*
Table 4. *Menu on 5th October 2010.*

Zajtrk/ Breakfast	Malica/ Snack	Kosilo/ Lunch
Starostna skupina 1- 3 let/ Age group 1-3 years Polenta in mleko/ Cornmeal mush with milk	Sadje/ Fruit	Špargljeva juha/ Asparagus soup Pečen mesni sir/ Grilled meatloaf Krompirjeva solata/ Potato salad Sadni sok/ Fruit juice
Starostna skupina 3 in več let/ Age group 3 years and older Turistična pašteta/ Fish spread Paprika/ Paprica Ovseni kruh/ Oat bread Čaj/ Tea		

3.4 Rezultati usmerjenega pregleda zaposlenih, ki pri svojem delu prihajajo v stik z živili

Med pregledom smo ugotovili, da so bili vsi zaposleni zdravi. Kuhar, invalid III. Kategorije, je povedal, da ima med delom občasne vročice. Pri njem smo po rokah ugotovili ureznine, rane na obnohtju in posamezne mozolje na obrazu. Pri vseh zaposlenih smo odvzeli bris nosu, žrela in kože s področja vnetja obnohtja in ureznin ter blato za mikrobiološke preiskave.

3.5 Komunikacija z mediji

6. 10. 2010 smo pripravili izjavo, v kateri smo pojasnili podatke in svetovali ukrepe za preprečevanje nadaljnjih okužb oz. zastrupitev.

3.6 Rezultati javnozdravstvenih ukrepov

S svetovanjem higienskih ukrepov in prilagoditvijo jedilnikov smo osebju kuhinje pomagali, da so uspeli premostiti kadrovsko in psihično stisko, v kateri so se znašli.

4 RAZPRAVA

Opravili smo preiskavo izbruha zastrupitve s hrano, ki je imela klinične in epidemiološke značilnosti stafilokokne zastrupitve. Ugotovili smo, da način priprave hrane in higiena osebja nista bila ustrezna, čeprav je to kuhinja, ki se trudi ugoditi vsem zdravstvenim zahtevam glede diet, ki ima vzpostavljen sistem HACCP ter ustrezno usposobljene in izobražene zaposlene. Ob kadrovski stiski so se pojavile nepravilnosti, katerih posledica je bila množično obolevanje. V kuhinji, v kateri je delala ena oseba z omejeno delovno sposobnostjo, ena oseba pa je bila zaradi bolezni odsotna z dela, so krompir za krompirjevo solato skuhali že en dan vnaprej. Krompir se je kontaminiral z bakterijo *S. aureus*, ki je izločala

enterotoksin A. Ker so ga pustili do naslednjega dne na sobni temperaturi, so bile izpolnjene ugodne razmere za njegovo razmnoževanje. Obolelo je 19,5 % oseb, ki so jedle v šolski menzi.

S pomočjo analitične epidemiološke raziskave in molekularnih mikrobioloških metod smo dokazali živilo in povzročitelja zastrupitve. Pri obravnavi epidemije smo bili vključeni epidemiologi, mikrobiologi, sanitarni inženirji in higieniki. Uspešna preiskava in obvladovanje izbruha nalezljive bolezni namreč zahtevata sodelovanje različnih strok. Takšno organizacijsko strukturo trenutno nudijo le območni Zavodi za zdravstveno varstvo.

Z retrospektivno epidemiološko študijo smo ugotovili, da je bil izbruh povezan z uživanjem pečenega mesnega sira in krompirjeve solate oz. da so imeli otroci in zaposleni, ki so jedli mesni sir, 24,2-krat višje tveganje, da zbolijo, kot tisti, ki sira niso jedli, ter otroci in zaposleni, ki so jedli krompirjevo solato, 19,4-krat višje tveganje kot tisti, ki solate niso jedli.

Stopnja obolevnosti v izbruhu je bila največja pri uživanju krompirjeve solate (74 %) in mesnega sira (69 %). Odgovor na vprašanje v anketi, ali so jedli določeno hrano, ni popolnoma zanesljiv. Mesni sir in krompirjeva solata sta bila postrežena na istem krožniku, ker sta bila skupni obrok. Tudi vzorčenje je bilo skupno, tako da tudi iz izsledka mikrobiološke preiskave dejansko ne vemo, katero živilo je bilo kontaminirano z bakterijo *S. aureus*, ki je izločalo ET A. Glede na izsledke v anketi je ostalo zdravih kar 22 oseb, ki so jedli krompirjevo solato, in 29 oseb, ki je jedli mesni sir. Po drugi strani pa je obolelo tudi 11 oseb, ki niso jedle krompirjeve solate, in 8 oseb, ki niso jedle mesnega sira. Sumimo, da je bila v anketiranju prisotna določena napaka. Anketni vprašalnik so izpolnjevali vzgojiteljice, starši, večji otroci in zaposleni. Vzgojiteljice si zaradi velikega števila otrok v skupinah težko zapomnijo, kaj so otroci zares pojedli. Prav tako odgovori majhnih otrok niso zanesljivi, še posebej, če sta bili živili skupaj

na krožniku. Izkušnje kažejo, da otrok hrano poskusi, in če mu okus ne ustreza, hrano pusti. Količine živila, potrebne za stafilokokno zastrupitev,so pri veliki koncentraciji ET lahko zelo majhne. Predvidevamo, da je že samo okušanje hrane zadosten razlog za blago zastrupitev. Za nastanek in resnost stafilokokne zastrupitve s hrano sta pomembna količina zaužitega ET in sprejemljivost osebe. Količina ET v hrani je odvisna od števila bakterije *S. aureus* v hrani, lastnosti seva, sestave hrane, temperature in od prisotnosti zaviralcev rasti stafilokokov. V hrani je dovolj toksina, kadar je število kolonij bakterije *S. aureus* več kot 10^5 kolonij/g. Najmanjši odmerek, ki že lahko povzroči zastrupitev s hrano, je 1 ng ET/g. Mikrobiološki izvid hrane v našem izbruhu ni podajal kvantitativne količine bakterij *S. aureus* na gram živila, na kar nismo imeli vpliva, saj nismo bili naročnik preiskave, poleg tega pa je bil vzorec preiskovan v drugem laboratoriju.

Z laboratorijskimi preiskavami smo potrdili prisotnost bakterije *S. aureus* v vseh prejetih kužninah obolelih (v izbruhanini enega izmed obolelih in tudi v vseh treh blatih obolelih). To, da je izolat *S. aureus* s kože roke zaposlene izločal enterotoksina A, iz nosu iste zaposlene pa enterotoksin C, ni nič nenavadnega, saj je posameznik lahko nosilec več sevov iste bakterije hkrati. Klasična mikrobiološka diagnostika temelji na tem, da po videzu ločujemo različne bakterijske kolonije in iz njih delamo čiste kulture.

O uspešnosti izolacije stafilokokov je v literaturi malo podatkov (18). V tem izbruhu smo tudi iz izbruhanine obolelega otroka uspeli izolirati bakterije *S. aureus,* verjetno zato, ker je bilo v zaužiti hrani veliko bakterij oz. smo pridobili kužnine takoj oz. le nekaj ur po zaužitju hrane. Izolat iz izbruhanine je izločal enterotoksin A. *S. aureus*, ki je izločal enterotoksin A, je bil izoliran tudi iz skupnega vzorca živila in poškodovane kože rok ene izmed zaposlenih. En izolat *S. aureus* iz blata obolelega otroka in trije izolati od zaposlenih v kuhinji niso izločali enterotoksinov. Tudi v literaturi so podatki o tem, da vsi izolati *S. aureus* obolelih v izbruhih ne izločajo toksinov. V študiji Brizzio s sodelavci so pri vseh izolatih *S. aureus* ugotovili, da ima le 58 % izolatov gene za toksine –v največjem deležu gene za ET A in ET B (29 %), medtem ko so geni za preostale ET C, ET D, ET E v nižjem deležu (14 %) (6).

Med zdravimi ljudmi je od 10 do 50 % nosilcev bakterije *S. aureus* in okoli 30 % teh sevov je enterotoksigenih (7). V novejši argentinski študiji so ugotovili, da je 37,5 % oseb, ki dela s hrano, nosilcev bakterije *S. aureus*, od katerih izolati izražajo gene za ET kar v 39,4 % oz. da kar 14,7 % oseb, ki dela s hrano, nosi potencialne bakterije za zastrupitev (13).

Verjetnejši dokaz za potrditev povzročitelja izbruha je ugotovitev istega enterotoksina pri osebju v kuhinji, hrani in bolnikih. S trenutno dosegljivimi reagenti je mogoče prepoznati 21 različnih enterotoksinov (19). Ker je kolonizacija z bakterijo *S. aureus* pogosta in ker večina sevov ne izloča enterotoksina, sama izolacija tega mikroorganizma ni zadosten dokaz za etiološko potrditev zastrupitve s hrano. Ker pa obstaja omejeno število različnih ET, je mogoče, da gre kljub enakemu profilu ET pri stafilokokih, izoliranih pri osebju v kuhinji, hrani in pri bolniku, za kolonizacijo z različnimi sevi bakterije *S. aureus.*

Šele z genotipizacijo lahko zanesljivo potrdimo, da gre za epidemiološko povezan izolat. Epidemiološko povezani izolati so izolati iz kužnin bolnikov ali okolja, odvzeti v določenem času in kraju kot del epidemiološke raziskave, ki kažejo, da so pridobljeni iz skupnega vira. Glede na kategorije genetske in epidemiološke povezanosti izolatov ločimo štiri kategorije: neločljive, tesno povezane, mogoče povezane in nepovezane izolate. Neločljivi izolati so genetsko enaki. S PFGE imajo enako število pasov. Epidemiološka razlaga te kategorije je, da izolati predstavljajo isti sev. Tesno povezani izolati v izbruhu so sevi, ki se s PFGE razlikujejo od izolata izbruha. Spremembe so nastale s posameznim genetskim dogodkom, kot je npr. točkovna mutacija ali insercija ali delecija DNA. Takšne spremembe se odražajo s PFGE v dveh ali treh pasovih. Takšne spremembe lahko nastanejo spontano tudi pri sevih med ponavljajočimi nasaditvami na gojiščih. Mogoče povezani izolati v izbruhu se razlikujejo od izolata izbruha s spremembami, ki izvirajo iz dveh neodvisnih genetskih dogodkov oz. razlikovanja s štirimi ali šestimi pasovi, ki jih razlagamo z večjimi genetskimi spremembami. Ti izolati imajo lahko skupen izvor, vendar niso tesno povezani. Takšne spremembe opazimo med izolati po daljšem obdobju več – kot šestih mesecih – ali so odvzeti večjemu številu bolnikov v izbruhu večjega obsega. Nepovezani izolati v izbruhu so izolati, pri katerih s PFGE dokažemo razlike v sedmih ali več pasovih oz. gre za manj kot 50 % pasov (16). Pri eni izmed treh zaposlenih oseb v kuhinji, v vzorcu hrane in pri treh obolelih smo izolirali bakterijo *S. aureus,* ki je izločala enterotoksin A. Te izolate smo fenotipsko in genotipsko tipizirali. Sevi so imeli enako občutljivost za antibiotike in tudi morfološko so bili videti enako. Vendar tudi to še ni zadosten dokaz, da so sevi enaki. To je razvidno iz naših izsledkov, pri katerih smo enak antibiogram ugotovili tudi pri sevih, ki niso izločali enterotoksina A (Tabela 3). Enakost sevov smo potrdili šele z genetsko tipizacijo.

Med sevi, ki so izločali stafilokokni enterotoksin A, smo s PFGE dokazali 96,3-odstotno sorodnost. Izolati, ki kažejo več kot 80-odstotno ujemanje profilov PFGE, so tesno sorodni in tvorijo skupek. V našem primeru smo dokazali, da gre za enak sev, ki se je prenesel z zaposlene na živilo in prek živila na obolele (9, 14, 17–20).

Zastrupitvam s hrano se lahko izognemo, če upoštevamo preventivne ukrepe (20). Vse osebe, ki pripravljajo hrano, je treba poučiti o higieni v kuhinji, umivanju in o negi rok. Hrano smemo dlje časa hraniti pri temperaturi, nižji od 4 °C, kajti pri tej temperaturi se stafilokoki ne razmnožujejo. Osebe, ki imajo gnojne okužbe rok, obraza in nosu, ne smejo pripravljati hrane (1, 3, 6).

Med izbruhom smo izvedli javnozdravstvene ukrepe. Osebju kuhinje smo začasno svetovali pripravljati prilagojene jedilnike, kar pomeni, da je jedilnik postal preprostejši, z manj različnimi dietami, preprost za pripravo s hrano, ki je bila temeljito toplotno obdelana. Vsem zaposlenim v kuhinji šole sta bila odrejena zdravstveni pregled in 3-urno izobraževanje iz higiene živil. Glede na laboratorijske izvide smo zaposleni osebi, ki je bila kolonizirana s sevom *S. aureus*, ki je izločal enterotoksin A, omejili delo z živili. Pozneje smo pregledali tudi zdravstveno-higienska navodila in jim svetovali nekaj popravkov. Svoj pomen v mozaiku razlage izbruha sta vsekakor imela tudi terenski ogled z odvzemom kužnin, ki je pokazal kadrovski primanjkljaj, in tudi usmerjeni pregled treh zaposlenih v kuhinji, ki je omogočil odvzem kužnin.

5 ZAKLJUČEK

Opisana raziskava je vzorčen primer dela in ukrepanja področnega epidemiologa in mikrobiologa ob pojavi izbruha. V prispevku smo prikazali časovni potek dogodkov ob izbruhu zastrupitve s hrano – od komunikacije in svetovanja po telefonu, postavitve hipoteze, anketiranja, terenskega ogleda kuhinje, odvzema kužnin, higienskega pregleda zaposlenih, mikrobiološke laboratorijske diagnostike, epidemiološke raziskave in postavitve zaključkov. Ukrepi ob izbruhu sestavljajo zloženko, ki vključuje posamezne faze, da pripelje do objektivnih zaključkov in rezultatov. Tipizacija izoliranih mikroorganizmov nam pomaga pri potrjevanju identifikacije vira izbruha. Epidemični sev bakterije *S. aureus* z enterotoksinom A smo odkrili v hrani, pri osebi, ki je pripravljala hrano, in pri obolelih, sicer že s testom določevanja stafilokoknih toksinov. Za zanesljivo ugotovitev enakosti izolatov bakterije *S. aureus* pa ni dovolj le enak tip izločanja ET, ampak tudi potrditev enakega genotipa, kar smo potrdili s PFGE.

Analiza dogodka je pokazala, da bi bilo treba v kuhinjah, v katerih se kuha za občutljive skupine prebivalstva, točno opredeliti kadrovske normative in ob kadrovskih izpadih omejiti število obrokov ali prilagoditi jedilnike.

Zahvala

Literatura

1. Tauxe RV, Swerdlow DL, Hughes JM. Foodborne disease. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and practise of infectious diseases. 5th ed. Philadelphia: Churchill Livingstone, 2000: 1150-60.

2. Grmek-Košnik I, Mueller-Premru M, Seljak M, Pavlica T, Peternelj B, Pohar M et al. Analiza epidemije stafilokokne zastrupitve s hrano. Zdrav Vestn 2000; 69: 439-43.

3. Kloos WE, Bannerman TL. Staphylococcus and micrococcus. In: Murray PR, Baron EJ, Pfaller MA, Tenover FC, Yolken RH. Manual of clinical microbiology. 6th ed. Washington: ASM Press, 1995: 282-98.

4. Kraigher A, Sočan M, Klavs I, Frelih T, Grilc E, Grgič Vitek M. Epidemiološko spremljanje nalezljivih bolezni v Sloveniji v letu 2010. Inštitut za varovanje zdravja, 2010. Pridobljeno 23. 10. 2013 s spletne strani: http://www.ivz.si/Mp.aspx?ni=105&pi=5&_5_id=788&_5_PageIndex=0&_5_groupId=219&_5_newsCategory=&_5_action=ShowNewsFull&pl=105-5.0.

5. Grmek-Košnik I, Virnik B, Pavlica T. Izolati proti meticilinu odpornega S. aureus (MRSA) iz blata bolnikov z akutnim gastroenterokolitisom pogosto izločajo enterotoksin (SE). Med Razgl 2000; 39: 144-5.

6. Brizzio AA, Tadeschi FA, Zalazar FE. Multiplex PCR strategy for the simultaneous identification of Staphylococcus aureus and detection of staphylococcal enterotoxins in isolates from food poisoning outbreaks. Biomedica 2013; 33: 122-7.

7. Hennekinne JA, De Buyser ML, Dragacci S. Staphylococcus aureus and its food poisoning toxins: characterization and outbreak investigation. FEMS Microbiol Rev 2012; 36: 815-36.

8. Johler S, Tichaczek- Dischinger PS, Rau J, Sihto HM, Lehner A, Adam M et al. Outbreak of staphylocolal food poisoning due to SEA-producing Staphylococcus aureus. Foodborne Pathog Dis 2013; 10: 777-81.

9. Boost MV, Wong A, Ho J, ODonoghue M. Isolation of methicillin-resistant Staphylococcus aureus (MRSA) from retail meats in Hong Kong. Foodborne Pathog Dis 2013; 10: 705-10.

10. Hyeon JY, Gyung TC, Sun HB, Kyung SK, Hyeon HL, Soo JK et al. A foodborne outbreak of Staphylococcus aureus associated with fried chicken in Republic of Korea. J Microbiol Biotechnol 2013; 23: 85-7.

11. Soares MJS, Tokumaru-Miyazaki NH, Noleto ALS, Figueiredo AMS. Enterotoxin production by Staphylococcus aureus clones and detection of Brazilian epidemic MRSA clone (III::B:A) among isolates from food handlers. J Med Microbiol 1997; 46: 214-21.

12. Villavicencio RT, Wall M. The pathogenesis of Staphylococcus aureus in the trauma patient and potential future therapies. Am J Surg 1996; 172: 291-6.

13. Jorda GB, Marucci RS, Guida AM, Pires PS, Manfredi EA. Carriage and characterization of Staphylococcus aureus in food handlers. Rev Argent Microbiol 2012; 44: 101-4.

14. Xiaomel Y, Bing W, Xiaoxia T, Qinghua H, Zhigang C, Jianzhong Z et al. Characterization of Staphylococcus aureus strains associated with food poisoning in Shenzhen, China. Appl Environ Microbiol 2012; 78: 6637-42.

15. Maina EK, Hu DL, Tsuji T, Omoe K, Nakane A. Staphylococcal enterotoxin A has potent superantigenic and emetic activities but not diarrheagenic activity. Int J Med Microbiol 2012; 302: 88-95.

16. CLSI. Performance standards for antimicrobial susceptibility testing. CLSI document M100-S20. Wayne: Clinical and Laboratory Standards Institute, 2010.

17. Tenover FC, Arbeit RD, Goering RV et al. Interpreting chromosomal DNA restriction patterns produced by pulsed-field electrophoresis: criteria for bacterial strain typing. J Clin Microbiol 1995; 33: 2233-9.

18. Bergdoll MS. Detection of the staphylococcal toxins. Adv Exper Med Biol 1996; 391: 465–79.

19. Mendel F, Reuven R. Rewiew of the inhibition of biological activities of food-related selected toxins by natural compounds. Toxins 2013; 5: 743-75.

20. Doyle ME, Hartmann FA, Lee Wong AC. Methicillin-resistant staphylococci: implications for our food supply? Anim Health Res Rev 2012; 13: 157-80.

EVALUATION OF SELF-RATED HEALTH – INFORMATION ON PATIENTS' UNMET NEEDS?

SAMOOCENA ZDRAVJA – INFORMACIJA O NEIZPOLNJENIH PRIČAKOVANJIH BOLNIKOV?

Davorina Petek[1], Janko Kersnik[1]

Abstract

Background: Self-rated health (SRH) reflects a person's experience of their own health, including the biological, sociological and psychological factors. It is frequently used in population studies but can provide primary physicians with additional information regarding patients' needs.

Objectives: To analyse determinants of SRH according to physical health, patient demographic characteristics and frequency of practice attendance.

Methods: Analysed data derived from the national part of the EPA-Cardio project. Several patient characteristics and SRH as an outcome measure were analysed in three groups of patients: with coronary disease, with high risk for cardiovascular disease and with low risk for cardiovascular disease, randomly chosen from the practice registers and lists of 36 practices.

Results: 2524 patients participated (response rate 70.1%). Coronary patients and those with the highest number of chronic diseases rated their health the lowest. Low SRH was found in women, older patients, the unemployed and in patients with a lower level of education. Low SRH was associated with higher body weight, lower satisfaction with the practice and a higher number of practice visits.

Conclusion: Several determinants were shown to be important for SRH. Physical health reflected by chronic disease and multimorbidity and life-style determined by body weight were shown to be important for SRH in the population of family practice. Socio-economic characteristics (employment, education level) were also reflected in SRH. Lower SRH, associated with higher frequency of attendance of the practice and lower satisfaction with the practice, points to the unmet needs of the patients.

Keywords: self-rated health, family medicine, cardiovascular risk

Izvleček

Izhodišča: Samoocena zdravja predstavlja bolnikov občutek lastnega zdravja; vključuje biološke, sociološke in psihološke dejavnike. Pogosto se uporablja v populacijskih raziskavah, osebni zdravnik pa lahko z njeno pomočjo pridobi dodatne informacije o bolniku in njegovih potrebah.

Cilji: Analizirati dejavnike samoocene zdravja glede na telesno zdravje, demografske značilnosti in pogostost bolnikovih obiskov v ambulanti družinske medicine.

Metode: Analizirali smo nacionalne podatke, pridobljene v okviru mednarodne raziskave EPA – Cardio. V treh skupinah bolnikov – koronarnih bolnikih, osebah z visokim tveganjem za srčno-žilne bolezni in osebah z nizkim tveganjem –, naključno izbranih iz registrov 36 slovenskih ambulant družinske medicine, smo analizirali povezavo bolnikovih značilnosti z njegovo samooceno zdravja kot odvisno spremenljivko.

Analizirali smo podatke 2.524 bolnikov (70,1% predvidenega vzorca). Bolniki z več kroničnimi boleznimi, koronarni bolniki in tisti z višjo telesno težo so slabše ocenili svoje zdravje. Svoje zdravje so slabše ocenili ženske, starejši, pogostejši obiskovalci ambulante in tisti, ki so bili manj zadovoljni z ambulanto.

Zaključki: Ugotovili smo več pomembnih dejavnikov, povezanih s samooceno zdravja. Občutek slabšega telesnega zdravja pri bolnikih z več sočasnimi boleznimi in nezdrav življenjski slog, predstavljen s prekomerno telesno težo, sta bila povezana s slabšo samooceno zdravja v populaciji obiskovalcev ambulante družinske medicine. Pomembne so bile tudi socioekonomske značilnosti bolnikov (izobrazba, zaposlitev). Nižja samoocena zdravja v povezavi z višjo frekvenco obiskov v ambulanti in s slabšim zadovoljstvom bolnikov kaže na neizpolnjene potrebe bolnikov.

Ključne besede: samoocena zdravja, družinska medicina, tveganje za srčno-žilne bolezni

[1] University of Ljubljana, Medical Faculty, Department of Family Medicine, Poljanski nasip 58, 1000 Ljubljana, Slovenia
Correspondence to: e-mail: davorina.petek@gmail.com

1 INTRODUCTION

Patients' well-being as well as their perceived physical and mental health can be simply measured using several quality of life questionnaires (1, 2). A simple measuring tool of their well-being is the "Self-rated health" scale (SRH) that represents a general subjective evaluation of one's own health. It reflects a person's experience of his/her own health and includes biological, sociological and psychological factors, which result in a combined evaluation that cannot be clearly explained by an external observer (3).

Assessment is based on one single question, which is: "How would you assess your health status in general?" The answer is presented by the Likert scale, rating health from one to five as excellent, very good, good, fair and poor. SRH is a frequently used measure in population studies (4, 5). Studies have shown that mortality cannot only be easily explained by medical conditions and risk factors (6), and several studies proved that SRH was a good predictor of mortality and of morbidity (5, 7-10). Physical and mental symptoms are correlates of SRH. SRH also predicts future social and health needs (11).

Several predictors of poor SRH were identified, among them physical limitation (12), obesity and an unhealthy life-style. Poorer health is reported by women (13) and associated with more frequent use of health care services, although the studies report conflicting results (14). There is evidence that SRH and physicians' rating of patients' health based on physical illnesses and problems can be divergent (3, 15). The population study of self-rated health in different social classes showed an association of better self-rated health with higher self-assessed social class (16) and poorer self-rated health in association with the severity of certain chronic illnesses – for example chronic obstructive pulmonary disease – regarding the physical aspect and the psychological component of the disease (17). SRH is perceived as an indicator of health-related quality of life (HRQL), which is a more structured measure with categories on physical and mental health. The difference between them is that HRQL measures impairment, a functional status influenced by disease and treatment, while SRH is an individual self-assessment resulting from a biological and sociological context (18). SRH may also capture perceived aspects of physical health that are not captured by the HRQL scales.

Slovenia has national data on HRQL from general population studies (19) or studies on special populations (20, 21), but we lack studies on SRH in the population of family practice. Our study was performed on a family practice population with three different groups according to objective data of physical health. We analysed determinants of SRH according to several patient characteristics considering what self-reported health status might mean in the context of clinical encounter with individual patient in general practice.

2 METHODS

We analysed the Slovenian part of the data collected in a cross-sectional EPA (European Practice assessment) – cardio study that took place from 2005-2009. Its protocol is described in detail elsewhere (22). The ethical approval was obtained from the National committee on medical ethics (No. 87/11/07).

2.1 Participants

A random sample of 56 family physicians from all over the country, stratified by the size of the practice (small practice – up to two full time equivalent (FTE) physicians, large practice – more than two FTE physicians) and its location (rural practices are located in a setting with less than 30,000 inhabitants and urban practices are located in a setting with more than 30,000 inhabitants). 36 of them (64.3%) agreed to participate. Each practice aimed to include a random sample of 100 patients: 40 patients from the patient list aged 18-45 years with low risk for cardiovascular disease, 30 patients with high risk of cardiovascular disease based on the Framingham risk assessment score and 30 patients with established coronary heart disease. The high-risk sample was created from the registers of patients with high risk for cardiovascular disease and a sample of cardiovascular patients was created by ICD10 codes for coronary heart disease. Exclusion criteria were diabetes mellitus, poor understanding of the native language and cognitive impairment.

2.2 Data collection

The practice nurse contacted the patients personally or by phone and obtained their informed consent for participating. The questionnaires were sent to them by post or given to them in person. All patients filled out the questionnaire, which is described elsewhere (22). For this analysis, we used demographic information, heath-service use behaviour, patients' assessment of the practice by Europep questionnaire, the patients' body mass index (BMI) and the number of chronic diseases. Patients also self-evaluated their health on a five point Likert scale rating from 1-excellent to 5-poor self-perceived health.

2.3 Statistical analysis

The data were analysed in the statistical program SPSS 17.0 (SPSS for Windows, Chicago: SPSS Inc.). The following modules were used: frequencies,

crosstabs, ANOVA, multivariate linear regression. The choice of the tests was adjusted to the nature of the data (nominal, ordinal and interval level). We tested 12 possible predictors of SRH (six demographic, two health service seeking behaviour, two on physical health, body mass index and satisfaction with the GP). For analytic purposes, we reversed the values of self-evaluated health on the Likert scale, giving health-assessment as poor one point and health assessment as excellent 5 points.

The results of the patients' evaluation questionnaire were presented in total score, using the Baker and Hearnshaw equation $[(\sum items\ 1–23)\times100/(5\times23)]\times1.25-25$. Twelve independent predictors were included in the multivariate linear regression model to predict patients' self-assessment of health.

3 RESULTS

2524 patients participated in the study (70.1% of the predicted sample); 56.1% were men. 787 patients had coronary heart disease (response rate 72.9%), 800 were high-risk patients (response rate 74.1%) and 937 were from the group of low risk patients (response rate 65.1%). The mean age was 54.83 (SD 17.2). The mean number of chronic diseases was 1.9 (SD 1.9, range 0-11), for coronary patients 4.2 (SD 1.9), for high-risk patients 1.8 (SD 1.1) and for low risk patients 0.29 (SD 0.2). Satisfaction with the practice and the GP was 89.0 (SD 11.0), for coronary patients 88.8 (SD 11.6) for high-risk patients 89.7 (SD 10.8) and for low risk patients 88.7 (SD 10.6).

Table 1. *Patient characteristics (number, %).*
Tabela 1. *Značilnosti bolnikov (število, %).*

Characteristics/Dejavniki		Group/Skupina							
		Coronary/ Koronarni		High risk/ Z visokim tveganjem		Low risk/ Z nizkim tveganjem		All/Vsi	
		N	%	N	%	N	%	N	%
Gender/Spol (N=2461)	Female (Ženske)	270	35.8	283	35.6	528	57.9	1081	43.9
	Male (Moški)	485	64.2	511	64.4	384	42.1	1380	56.1
Education/ Izobrazba (N=2392)	≤ 9 years (let)	292	39.8	279	36.8	134	14.9	705	29.5
	10–13 years (let)	314	42.8	319	42.1	453	50.3	1086	45.4
	> 13 years (let)	128	17.4	160	21.1	313	34.8	601	25.1
Employment/ Zaposlitev (N=2524)	Yes[1] (da)	125	15.9	210	26.3	788	84.1	1123	44.5
	No[2] (da)	662	84.1	590	73.8	149	15.9	1401	55.5
Marital status/ Zak. Stan (N=2524)	Married, cohabiting poročen, v skupnosti	557	70.8	611	76.4	649	69.3	1817	72.0
	Other[3] drugo	230	29.2	189	23.6	288	30.7	707	28.0
BMI[4]/ITM[4] (N=2426)	underweight ≤18.5 pod normalo ≤18.5	4	0.5	2	0.3	15	1.7	21	0.9
	normal 18.6–25 normalna 18.6–25	161	21.4	141	18.3	434	48.2	736	30.3
	overweight 25.1–30	372	49.3	374	48.4	312	34.7	1058	43.6
	obese ≥30.1	217	28.8	255	33.0	139	15.4	611	25.2
N chronic diseases/ Št. kron. bol. (N=2524)	0–1	331	42.1	657	82.1	923	98.5	1911	75.7
	2–3	218	27.7	121	15.1	12	1.3	351	13.9
	4–5	178	22.6	20	2.5	1	0.1	199	7.9
	≥6	60	7.7	2	0.3	1	0.1	63	2.5

Satisfaction/ Zadovoljstvo (N=2524)	0–79	128	16.2	111	13.9	158	16.8	397	15.7
	80–89	311	39.5	314	39.3	346	36.9	971	38.5
	90–100	348	44.2	375	46.9	433	46.2	1156	45.8
Attachment to the practice[5]/ Stalnost izbire ambul. (leta)[5] (N=2455)	≤ 2	35	4.6	42	5.4	112	12.3	189	7.6
	3–7	86	11.3	87	11.1	226	24.9	399	16.3
	8–12	101	13.3	112	14.3	169	18.6	382	15.6
	≥ 13	540	70.9	544	69.3	401	44.2	1485	60.5
GP visit frequency[6]/ Frekvenca obiskov zdr.[6] (N=2459)	0–3 times (krat)	123	16.2	266	34	596	64.9	985	40.1
	4–7 times (krat)	444	58.	414	52.9	245	26.7	1103	44.9
	8–9 times (krat)	76	10.0	36	4.6	33	3.6	145	5.9
	≥10 times (krat)	115	15.2	67	8.6	44	4.8	226	9.1
Location[7]/ Lokacija[7] (N=2524)	Urban (mestna)	558	70.9%	557	69.6%	667	71.2%	1782	70.6
	Rural (podeželska)	229	29.1%	243	30.4%	270	28.8%	742	29.4

[1] employed, self-employed/ zaposlen, samozaposlen
[2] housekeeper, unemployed, unable to work, retired/ gospodinja, nezaposlen, nezmožen za delo, upokojen
[3] single, divorced, widow/widower/ samski, razvezan, ovdovel
[4] body mass index (BMI) kg/m^2/ indeks telesne mase (ITM) kg/m^2
[5] years being treated by the same doctor/ leta zdravljenja pri istem izbranem zdravniku
[6] number of visits of the practice in the last year/ število obiskov pri zdravniku v zadnjem letu
[7] urban: more than 30.000 inhabitants/ mestna: nad 30.000 prebivalcev

The lowest percent of SRH as poor was found in the group of healthy patients (4.1%) and the lowest percent of SRH as excellent was found in the coronary group (0.8%)

Table 2. *Scale of self-assessment of health per groups of patients (number, percentage).*
Tabela 2. *Lestvica samoocene zdravja po skupinah bolnikov (število, odstotek).*

		Coronary/ Koronarni (N=756)		High risk/ Z visokim tveganjem (N=785)		Low risk/Z nizkim tveganjem (N=909)		All/Vsi (N=2450)	
		N	%	N	%	N	%	N	%
Self-rated health/ Samoocena zdravja	Poor/ Zelo slabo	136	18.0	71	9.0	37	4.1	244	9.7
	Fair/ Zadovoljivo	**351**	**46.4**	316	40.3	139	15.3	806	31.9
	Good/ Dobro	236	31.2	**334**	**42.5**	**386**	**42.5**	**956**	**37.9**
	Very good/ Zelo dobro	27	3.6	52	6.6	276	30.4	355	14.1
	Excellent/ Odlično	6	0.8	12	1.5	71	7.8	89	3.5

Table 3 shows the means for SRH according to included determinants of demographic characteristics, physical health and body weight as characteristics of life-style, socio-economic characteristics, patient satisfaction with the practice and frequency of attendance of the practice.

Table 3. *Self rated health ranging from 1point (poor) to 5 points (excellent) by study population characteristics. Data are presented by mean (M) and standard error (SE).*

Tabela 3. *Samoocena zdravja na lestvici od 1 točke (slabo) do 5 točk (odlično), glede na značilnosti bolnikov. Podatki so predstav*ljeni s povprečno vrednostjo (M) in standardno napako (SE).

		M (SRH) (samoocena)	SE
Group of patients/ Skupina bolnikov	Coronary/ Koronarni	2.36	0.09
	High risk/ Z visokim tveganjem	2.42	0.09
	Low risk/ Z nizkim tveganjem	**2.62**	**0.10**
Gender/ (Spol)	Female/ (ženski)	2.37	0.08
	Male/ (moški)	**2.51**	**0.08**
Age (years)/ Starost (leta)	≤39	**2.83**	**0.11**
	40–49	2.39	0.10
	50–59	2.26	0.10
	60–69	2.40	0.10
	70–79	2.36	0.10
	≥80	2.16	0.11
Employment status/ Zaposlitveni status	others	2.37	0.08
	employed	**2.57**	**0.09**

BMI (kg/m^2)/ (ITM kg/m^2)	underweight (≤18.5)	**2.695**	**0.19**
	normal (18.6–25.0)	2.420	0.08
	overweight (25.1–30.0)	2.380	0.07
	obese (≥30.1)	2.264	0.08
GP visit frequency (times per year)/ Št. obiskov na leto pri ZDM	0–1 times	**2.966**	**0.10**
	2–3 times	2.580	0.09
	4–5 times	2.558	0.09
	6–7 times	2.349	0.09
	8–9 times	2.397	0.12
	≥10 times	1.959	0.09
Number of chronic diseases/ Št. kroničnih bolezni	0–1	**2.669**	**0.06**
	2–3	2.541	0.07
	4–5	2.544	0.08
	6–7	2.398	0.14
	≥8	2.189	0.26
Satisfaction/ Zadovoljstvo (0–100)	0–59	2.196	0.15
	60–69	2.438	0.11
	70–79	2.558	0.09
	80–89	2.542	0.08
	90–100	**2.607**	**0.08**
Years of education/ Leta izobrazbe	≤ 9	2.307	0.09
	10–13	2.457	0.08
	≥ 13	**2.641**	**0.09**

Table 4 shows the results of multivariate analysis; the model explains 32% of variance.

Table 4. *Multivariate linear regression model – prediction of SRH with the patients' demographic characteristics, health characteristics and health seeking behaviour (N=1660).*
Tabela 4. *Multivariatna linearna regresijska analiza – napoved samoocene zdravja z bolnikovimi demografskimi značilnostmi, telesnim zdravjem in iskanjem zdravstvene pomoči (N=1660).*

Model	Unstandardized coefficients/ Nestandardizirani koeficienti		Standardized coefficients/ Standardizirani koeficienti	t	p	Confidence interval/ Interval zaupanja
	B	SE (B)	Beta			
Constant/ Konstanta	3,380	0,285		11,877	0,000	2,822;3,938
Location/ Lokacija[1]	-0,035	0,044	-0,016	-0,778	0,437	-0,122;0,053
Group of patients/ Skupina bolnikov[2]	-0,070	0,049	-0,059	-1,425	0,154	-0,166;0,026
Gender (M)/ Spol (M)	**0,091**	**0,041**	**0,047**	**2,203**	**0,028**	**0,010;0,172**
Age (years)/ Starost (leta)	**-0,011**	**0,002**	**-0,194**	**-5,201**	**0,000**	**-0,015;-0,007**
Years of education/ Leta šolanja	**0,155**	**0,029**	**0,119**	**5,364**	**0,000**	**0,098;0,211**
Employment status[3]/ Zaposlitveni status[3]	**0,117**	**0,053**	**0,061**	**2,235**	**0,026**	**0,014;0,221**
Marital status[4]/ Zakonski stan[4]	-0,018	0,045	-0,008	-0,409	0,683	-0,106;0,070
BMI[5]/ ITM[5]	**-0,073**	**0,027**	**-0,058**	**-2,718**	**0,007**	**-0,125;-0,020**
Same doctor[6]/ Isti zdravnik[6]	0,003	0,020	0,003	0,136	0,892	-0,037;0,042
GP visit frequency[7]/ Frekvenca obiskov zdravnika[7]	**-0,167**	**0,016**	**-0,241**	**-10,481**	**0,000**	**-0,199;-0,136**
Number of chronic diseases/ Št. kron. bol.	**-0,099**	**0,016**	**-0,205**	**-6,089**	**0,000**	**-0,131;-0,067**
Satisfaction/ Zadovoljstvo (0–100)	**0,005**	**0,002**	**0,058**	**2,871**	**0,004**	**0,002;0,009**

F = 67,296
Significance level p/ Stopnja značilnosti < 0,001
Adjusted R^2/ % pojasnjene variance = 0,324

Legend/ Legenda:
[1] Urban/rural/ mestno/vaško
[2] coronary, high risk, low risk/ koronarni, visoko ogroženi, nizko ogroženi
[3] employed, self-employed; zaposlen, samozaposlen/ housekeeper, unemployed, unable to work, retired/ gospodinja, nezaposlen, nezmožen za delo, upokojen

[4] single, divorced, widow/widower, married/cohabitating/ samski, razvezan, ovdovel, poročen/živi v skupnosti
[5] body mass index (BMI) kg/m^{2}/ indeks telesne mase (ITM) kg/m^{2}
[6] years being treated by the same doctor/ leta pri istem izbranem zdravniku
[7] Število obiskov pri zdravniku v zadnjem letu/ number of the practice visits in the last year

4 DISCUSSION

4.1 Main findings

The patients who self-rated their health poorly were more frequent visitors to the practice and evaluated their practice with worse ratings. Our results showed several expected associations of SRH with patient characteristics. Better physical health presented by a lower number of chronic diseases and thus less multimorbidity predicted better SRH. Other predictors of worse self-assessment that we found could be grouped as biological (higher age, female gender), socio-economic (unemployed and lower education level) and frequency of health services utilisation (patients that frequently come to the practice regardless of the reason for the visit self-assess their health worse). Risk for coronary disease was not found to be an independent predictor of self-rated health.

4.2 Strengths and limitations of the study

We performed the study strictly in compliance with the protocol, with special emphasis on random sampling. This was made possible by patient lists and registers of coronary patients and high-risk patients that every practice must keep, according to the requirements of the National preventive programme. The response rate of the practices and the included patients was not very high, but it was the highest among the participating countries in the international EPA-Cardio study. The patients were distributed into three groups by their GPs, which represented a global level of physical health: group 1 (patients with coronary disease) with the worst health, group 3 (low risk for cardiovascular disease) in the best physical health. We have to mention that the grouping was made according to the aim of the EPA-Cardio study, which examined the quality of cardiovascular prevention on three levels and the groups were not homogenous according to gender (more men in high risk and coronary group). Physical health was also determined by every patient as a self-assessed number of all chronic diseases from the presented list of chronic diseases as an additional variable of physical health. We did not check these data in medical documentation.

We realise that the included predictors did not explain two thirds of the variance of the model. We did not include psychological characteristics of the patients into the model. There exists in particular a question of the patient's stress and the personal response. This would demand additional questions related to stress and to psychological characteristics, which were not included in the purpose of the study. Finally, this study was cross-sectional, which means that it does not give any information about the predictive value of this measurement. Further research should explore it.

4.3 Interpretation of the study results

Our results about the impact of physical health and multimorbidity are in line with other studies. Multimorbidity showed negative impact on SRH in specific population in the study of Vos (23) as well. SRH in our study was better in healthier groups of patients. Those with coronary heart disease assessed their health worse than those at high risk for CVD or those at low risk for CVD. Nevertheless, we could not prove that the CVD risk groups of patients were an independent predictor of self-rated health. Multimorbidity seems to be more important for self-assessment of health than a single chronic disease, if we do not take into account the stage and functional disability due to this disease. These results can be compared to other studies that show that patients with an advanced stage of chronic diseases assess their health as worse compared to patients with a less severe stage of disease (17).

We found lower SRH in patients with a lower education level. The level of education can be connected with unhealthy behaviour, as shown in other studies (24). Associations of lower education and economic status on the self-assessment of health and negative prediction of chronic diseases on the self-rating of health were also found in other studies (25, 26). Several similar studies used quality of life as an outcome. Frequency of attendance was shown to be associated with lower perceived quality of life (27). Similar results were found in the Klemenc-Ketis study, showing that lower HRQL was found in older, less educated patients and those with specific health problems mostly associated with chronic pain (rheumatic diseases, back pain) (19). Women, who rated their health as poor, stated severe pain syndromes more frequently (23). In our study, female gender showed to be an independent predicting variable for lower self-rated health, while CVD risk groups of patients were not.

Patients with lower SRH also more critically evaluated their practice. A higher number of clinical visits and lower satisfaction with the doctor were found also in Linn's study, showing that occasionally physicians do not realise that additional intervention is necessary for patients who self-assess their health as low, have more symptoms and a greater need for health care and thus are not getting what they need (15). However, they are probably not able to communicate their perception of health and their needs to the doctor, who presumably rates patients' health differently from them. Therefore, this simple measure can provide the patients' perspective towards the doctor and with the Jylhä theoretical model can serve as a screening tool for patients' health status; it can also support doctor-patient relationships and guarantee further attention in case of poor SRH (28).

We could not prove the connection of SRH with marital status and with the length of attachment to the practice. The model explained 32% of the variance, showing that there are other determinants of it. The impact of stress and adaptation to perceived health was addressed and showed to be important in various other studies (29).

Associations in lower education and social status, higher scores of anxiety and depression, the number of chronic somatic diseases and a lower perceived quality of life have also been identified in Slovenian General Practice attendees (21), showing that the analysis of quality of life and SRH share similar determinants.

Other studies showed that some life-style factors can have an impact on SRH and this can even predict weight change in the future. We included only one (indirect) parameter of life-style - BMI and showed that lower body weight is associated with better self-assessment of health, similar to other studies (30, 31).

5 CONCLUSION

Self-assessment of health is a simple and short evaluation of a patient's well-being. It is a result of demographic predictors, social context, physical health and psychological factors. SRH can provide family doctors with additional information about patients' perceived health problems, especially in frequent visitors to the practice. A patient's lower SRH is associated with worse patient evaluation of the practice and points to possible problems in the patient-doctor relationship. It can show the GP that he/she might not be aware of the patients' needs and expectations. Further studies should address its usefulness in the clinical approach to the patient, usefulness in long-term evaluation and possibly the usefulness of self-assessment of health as a predictor of the development of a disease or disability (32).

Conflict of interest

The authors declare that there is no conflict of interest

Acknowledgments

References

1. The EuroQol Group. EuroQol – a new facility for the measurement of health-related quality of life. Health Policy 1990; 16: 199-208.
2. Feeny D, William F, Michael B, Torrance GW. Multi-attribute health status classification systems: Health Utilities Index. Pharmacoeconomics 1995; 7: 490–502.
3. Undén AL, Elofsson S. Health from the patient's point of view: how does it relate to the physician's judgement? Fam Pract 2001; 18: 174-80.
4. Krause NM, Jay GM. What do global self-rated health items measure? Med Care 1994; 32: 930–42.
5. Heistaro S, Jousilahti P, Lahelma E, Vartiainen E, Puska P. Self rated health and mortality: a long term prospective study in eastern Finland. J Epidemiol Community Health 2001; 55: 227–32.
6. Heidrich J, Liese AD, Löwel H, Keil U.Self-rated health and its relation to all-cause and cardiovascular mortality in southern Germany: results from the MONICA Augsburg cohort study 1984-1995. Ann Epidemiol 2002; 12: 338-45.
7. Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. J Health Soc Behav 1997; 38: 21-37.
8. Nery Guimarães JM, Chor D, Werneck GL, Carvalho MS, Coeli CM, Lopes CS, Faerstein E. Association between self-rated health and mortality: 10 years follow-up to the Pró-Saúde cohort study. BMC Public Health 2012; 12: 676.
9. Bopp M, Braun J, Gutzwiller F, Faeh D, Swiss National Cohort Study Group. Health risk or resource? Gradual and independent association between self-rated health and mortality persists over 30 years. PLoS One 2012; 7: e30795.
10. Benyamini Y, Blumstein T, Lusky A, Modan B. Gender differences in the self-rated health-mortality association: is it poor self-rated health that predicts mortality or excellent self-rated health that predicts survival? Gerontologist 2003; 43: 396-405.
11. Griffiths P, Ullman R, Harris R. Self assessment of health and social care needs by older people: a multi-method systematic review of practices, accuracy, effectiveness and experience. Available Feb 19, 2013 at: http://www.netscc.ac.uk/hsdr/files/project/SDO_FR_08-1204-030_V01.pdf.
12. Rohrer JE, Merry SP, Rohland B, Rasmussen N, Wilshusen L. Physical limitations and self-rated overall health in family medicine patients. Clin Rehabil 2008; 22 :38-44.
13. Anson O, Paran E, Neumann L, Chernichovsky D. Gender differences in health perceptions and their predictors. Soc Sci Med 1993; 36: 419–27.
14. Parslow R, Jorm A, Christensen H, Jacomb P, Rodgers B. Gender differences in factors affecting use of health services: an analysis of a community study of middle-aged and older Australians. Soc Sci Med 2004; 59: 2121-9.
15. Linn MW, Linn BS, Skyler JS, Harris R. The importance of self-assessed health in patients with diabetes. Diabetes Care 1980; 3: 599-606.
16. Farkas J, Pahor M, Zaletel-Kragelj L. Self-rated health in different social classes of Slovenian adult population: nationwide cross-sectional study. Int J Public Health 2011; 56: 45-54.
17. Farkas J, Kosnik M, Zaletel-Kragelj L, Flezar M, Suskovic S, Lainscak M. Distribution of self-rated health and association with clinical parameters in patients with chronic obstructive pulmonary disease. Wien Klin Wochenschr 2009; 121: 297-302.
18. Layes A, Asada Y, Kepart G. Whiners and deniers - what does self-rated health measure? Soc Sci Med 2012; 75: 1-9.
19. Klemenc-Ketis Z, Smogavec M, Softic N, Kersnik J. Health-related quality of life: a population based study from Slovenia. Cent Eur J Public Health 2011; 19: 7-12.
20. Klemenc-Ketis Z, Kersnik J, Eder K, Colaric D. Factors associated with health-related quality of life among university students. Srp Arh Celok Lek 2011; 139: 197-202.

21. Cerne A, Rifel J, Rotar-Pavlic D, Svab I, Selic P, Kersnik J. Quality of life in patients with depression, panic syndrome, other anxiety syndrome, alcoholism and chronic somatic diseases: a longitudinal study in Slovenian primary care patients. Wien Klin Wochenschr 2012; 125: 1-7.

22. Wensing M, Ludt S, Campbell S et al. European Practice Assessment of Cardiovascular risk management (EPA Cardio): protocol of an international observational study in primary care. Implement Sci 2009; 4: 3.

23. Vos HM, Bor HH, van Rangelrooij-Minkels MJ, Schellevis FG, Lagro-Janssen AL. Multimorbidity in older women: the negative impact of specific combinations of chronic conditions on self-rated health. Eur J Gen Pract 2013; 19: 117-22.

24. Laaksonen M, Talala K, Martelin T, Rahkonen O, Roos E, Helakorpi S et al. Health behaviours as explanations for educational level differences in cardiovascular and all-cause mortality: a follow-up of 60 000 men and women over 23 years. Eur J Public Health 2008; 18: 38-43.

25. Arnsberger P, Lynch U, Li F. The effects of caregiving on women's self -assessed health status: an international comparison. Health Care Women Int 2012; 33: 878-95.

26. Heistaro S, Laatikainen T, Vartiainen E, Puska P, Uutela A, Pokusajeva S et al. Self-reported health in the Republic of Karelia, Russia and in north Karelia, Finland in 1992. Eur J Public Health 2001; 11: 74-80.

27. Kersnik J, Švab I, Vegnuti M. Frequent attenders in general practice: quality of life, patient satisfaction, use of medical services and GP characteristics. Scan J Prim Health Care 2001; 19: 174-7.

28. Jylha M. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. Soc Sci Med 2009; 69: 307–16.

29. Selič P, Petek D, Serec M, Makovec MR. Self-rated health and its relationship to health/ life problems and coping strategies in members of the professional Slovenian armed forces. Coll Antropol 2012; 36: 1175-82.

30. Okosun IS, Choi S, Matamoros T, Dever GE: Obesity is associated with reduced self-rated general health status: evidence from a representative sample of white, black, and Hispanic Americans. Prev Med 2001; 32429-36.

31. Prosper MH, Moczulski VL, Qureshi A: Obesity as a predictor of self-rated health. Am J Health Behav 2009; 33: 319-29.

32. Møller L, Kristensen TS, Hollnagel H.Self rated health as a predictor of coronary heart disease in Copenhagen, Denmark. J Epidemiol Community Health 1996; 50: 423-8.

THE SECULAR TREND IN THE PREVALENCE OF OVERWEIGHT AND OBESITY IN THE POPULATION OF PRIMARY SCHOOL CHILDREN FROM LJUBLJANA (SLOVENIA)

SEKULARNI TRENDI PREVALENCE PREKOMERNE PREHRANJENOSTI IN DEBELOSTI MED POPULACIJO LJUBLJANSKIH OSNOVNOŠOLCEV

Marjeta Kovač[1], Gregor Jurak[1], Lijana Zaletel Kragelj[2], Bojan Leskošek[1]

Abstract

Background: *The prevalence of overweight and obesity among children has increased dramatically in recent decades. The survey examined overweight and obesity in the population of boys and girls from Ljubljana, the capital of Slovenia, aged seven through fourteen from 1991 to 2011.*

Methods: *An annually repeated cross-sectional study of data from the national SLOFIT monitoring system was used. The body mass index cut-off points of the International Obesity Task Force were used to identify the prevalence of overweight and obesity. Multinomial logistic regression was used for modelling the probability of overweight and obesity as a function of time (year of measurement), sex and age of subjects.*

Results: *In 1991-2011 period, the odds for overweight and obesity among primary school children (n = 376,719) increased every year by 1.7% (95% CI: 1.6-1.9) and 3.7% (3.4-4%) respectively. Boys have 1.17 (95% CI: 1.15-1.20) times higher odds of becoming overweight and 1.39 (95% CI: 1.35-1.44) times higher odds of becoming obese than girls. In comparison to the reference group (age of 14), the highest odds for overweight were found at the ages of nine and ten (1.39; 95% CI: 1.34-1.44), while for the obesity the highest odds were at the age of eight (2.01; 95% CI: 1.86-2.16).*

Conclusion: *From 1991 to 2011, overweight and obesity clearly became more prevalent in children from Ljubljana. This trend has been more obvious among boys than girls. In comparison to 14-year-old boys and girls, the highest odds for excessive weight were found below the age of 10.*

Key words: public health, childhood obesity, body mass index, primary school, sex, age

Izvleček

Izhodišča: *V razvitem svetu se zaznava izrazit porast prekomerne prehranjenosti in debelosti med otroki in mladostniki. V raziskavi smo analizirali prekomerno prehranjenost in debelost med ljubljanskimi osnovnošolci, starimi od sedem do štirinajst let, v obdobju po osamosvojitvi Slovenije.*

Metode: *Uporabili smo podatke vsakoletnih meritev telesne višine in telesne mase iz nacionalne zbirke Športnovzgojni karton med letoma 1991 in 2011. V študijo je bila vključena populacija učencev (N=376.719), ki so v opazovanem obdobju obiskovali ljubljanske osnovne šole, njihovi starši pa so pisno soglašali z meritvami. Iz dobljenih podatkov smo izračunali indekse telesne mase, za določitev prekomerne prehranjenosti pa smo uporabili merila Mednarodne delovne skupine za boj proti debelosti. Prevalenco prekomerne prehranjenosti in debelosti glede na spol in starost merjencev ter čas kot kovariato (leta merjenja) smo izračunali z multinominalno logistično regresijo.*

Rezultati: *Vsako leto se ne glede na spol merjencev obet za prekomerno prehranjenost poveča za 1,7% (95% CI: 1,6–1,9%) in za debelost za 3,7% (95% CI: 3,4–4%). Med fanti je obet za prekomerno prehranjenost 1,17-krat (95% CI: 1,15–1,20) in za debelost 1,39-krat (95% CI: 1,35–1,44) večji kot med dekleti. Glede na štirinajstletnike je največji obet za prekomerno prehranjenost opazen med devet- in desetletniki (1,39; 95% CI: 1,34–1,44), za debelost pa med osemletniki (2,01; 95% CI: 1,86–2,16).*

Zaključki: *V obdobju med letoma 1991 in 2011 se je med ljubljanskimi osnovnošolci povečal delež prekomerno prehranjenih in debelih. Prevalenca prekomerne prehranjenosti in debelosti je večja pri fantih kot dekletih, v primerjavi z učenci ob koncu šolanja pa je največja med osmim in desetim letom starosti.*

Ključne besede: javno zdravje, otroška debelost, indeks telesne mase, osnovna šola, spol, starost

[1] University of Ljubljana, Faculty of Sport, Gortanova 22, 1000 Ljubljana, Slovenia
[2] University of Ljubljana, Medical Faculty, Department of Public Health, Zaloška 4, 1000 Ljubljana, Slovenia
Correspondence to: e-mail: marjeta.kovac@fsp.uni-lj.si

1 INTRODUCTION

The extensive changes in people's lifestyles also influence the physical development of children and youth (1). Lack of movement and unsuitable eating habits result in overweight and obesity (OW&OB) (2, 3) that are reaching epidemic proportions in the developed world (4–6).

The mechanism of obesity development is not fully understood. It has been confirmed that obesity occurs when energy intake exceeds energy expenditure, suggesting that a proper diet and physical activity are the key strategies for controlling the current epidemic of obesity (7). Genetic factors influence the susceptibility of a given child to an obesity-conducive environment. However, socio-economic status, level of education, lifestyle preferences and the cultural environment also seem to play major roles in the rising prevalence of obesity worldwide (1, 3, 8).

The World Health Organisation has recognised obesity as a multifactorial disease with a complex aetiology, which holds many health consequences (9). Several reviews summarise the consequences, both short- and long-term, of childhood and adolescent obesity, including cardiovascular risk factors and coronary heart disease mortality, type 2 diabetes, non-alcoholic fatty liver disease, asthma, sleep-disordered breathing, systemic inflammation and orthopaedic problems (9–11). Furthermore, obesity also has social and psychological consequences: obesity is linked with low self-image, low self-confidence and depression (11, 12).

There is a wide variety of definitions of child obesity. No commonly accepted standard has yet emerged (13); although less sensitive than skin-fold thickness, body mass index (BMI; weight/height²) is widely used. A number of studies on the prevalence of OW&OB in European children and adolescents in different years after 1990 showed that the prevalence was especially high in southern Europe and substantially lower in central and northern Europe (11, 14–16). There are differences in obesity prevalence between boys and girls, e.g. some studies conducted on British (8, 17), Irish (18), Spanish (19), Swedish (20) and Turkish (21) sub-populations showed higher prevalence among girls, while the data from the Health Behaviour in School-aged Children (HBSC) survey (14, 16) and studies conducted on Austrian (22), Italian (23) and Finish sub-populations (24) indicated the opposite trends. The reasons for this may include gender differences in food choices and dietary concerns (16). Gender patterns may indicate that environmental influences are more detrimental for boys: boys eat more fast food (25), while girls are more likely to pay attention to food as a way to influence health and to

meet nutritional recommendations (16). Furthermore, parents are less likely to encourage boys to control their weight (16) and preventive interventions are less effective for boys (14).

In Slovenia, the prevalence of OW&OB among children and adolescents has also increased dramatically in recent decades, especially in younger age groups (26–30). It is important to follow secular trends of OW&OB between age groups in childhood, as overweight and obese children have a greater risk of becoming overweight or obese adults (27, 31, 32). Independent of genetic differences, environmental variables (geographic position, socio-economic level of family, educational level of parents, maternal employment, etc.) are extremely important predictors of obesity that operate in complex ways, both within and between countries (8, 28). Ljubljana, the capital of Slovenia, located in central geographic position of the country, has the highest rate of GDP per capita and the highest purchasing power standards; furthermore, the earnings of persons employed in Ljubljana are the highest in the country (33).

Therefore, the main purpose of the study was to examine the prevalence of OW&OB among primary school children from Ljubljana, aged 7 to 14. The aim of the study was to analyse twenty-year trends in the prevalence according to sex and age.

2 METHODS

2.1 Participants

The repeated studies consist of boys (n = 194,415) and girls (n = 182,304) from Ljubljana primary schools who enrolled in the Slovenian physical fitness monitoring system (SLOFIT) (34) from 1991, the year of independence from the former Yugoslavia, until 2011. Only schools that were part of the Ljubljana municipality in 2011 were taken into consideration. Information on birth dates was obtained from school records. For data analysis, the age limits were set as follows: 7 years: 7.0–7.99 years, 8 years: 8.0–8.99 years, to 14 years: 14.0–14.99 years.

Only healthy boys and girls who were not exempt from physical education (PE) for health reasons and whose parents had given their written consent to participate in the measurements were included. The number of subjects whose data of body height and body weight were included in the analysis is presented in Figure 1 and 2. Between 1991 and 2011, slightly less than 95% of primary school boys and girls below the age of 15 were measured every year (30).
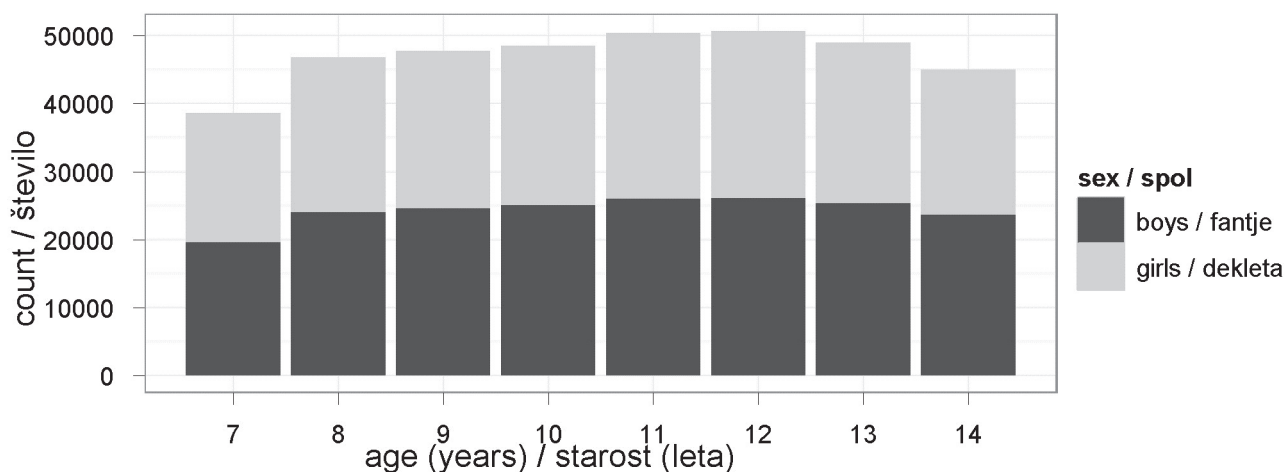
Figure 1. *Structure of participants by age.*
Slika 1   *Struktura vzorca glede na starost.*

The Slovenian school system has undergone a number of changes in recent years. The new nine-year primary education system was gradually implemented between school years 1999/2000 to 2007/2008. Some of the students that started with schooling earlier (before the age of 6) were not included in the sample; they were either not yet 7-years-old or they were older than 15-years-old before the April when measurements were held. Therefore, at the ages 7 and 14, a smaller proportion of students was included in the measurements.
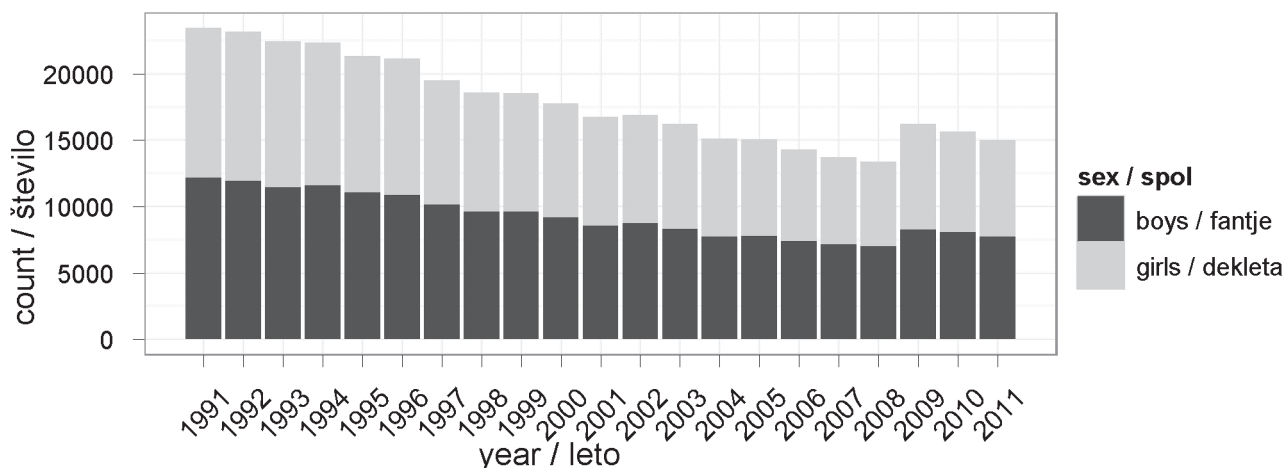

Figure 2. *Structure of participants by year of observation.*
Slika 2.   *Struktura vzorca glede na leta opazovanja.*

As a result of the birth rate having strongly decreased from after the independence of Slovenia to 2003 (27) and not all children having been included in the nine-year basic education system at the same time, a smaller number of students was measured until 2008.

2.2 Measurements

The study was approved by the Human Research Ethics Committee of the Faculty of Sport, Ljubljana, Slovenia, and supported by the Ministry of Education, Science and Sport.

Measurements were held annually in April during PE classes in all Slovenian schools. All measurements of body height and body weight were conducted by trained PE teachers who completed a 30-hour course in anthropometric measurement during their studies, according to the standard protocol. Subjects were barefoot in their shorts and T-shirts. Height was measured with stadiometers of various brands to the nearest 0.1 cm and weight with pre-calibrated portable scales of various brands to the nearest 0.1 kg. The collected data were checked to detect coding errors.

2.3 Data analysis

Data were analysed with the use of the SPSS 18.0 statistical package. OW&OB were defined by International Obesity Task Force (IOTF) criteria (age- and sex-specific BMI cut-off points correspond to adults' cut-off points of 25 kg/m² for overweight and 30 kg/m² for obesity) (5, 35) and the prevalence was determined separately for age (7- to 14-years old), sex and the year of measurement (1991 to 2011).

Confidence intervals (CI) for the proportions were computed using the Collett formula (36). Multinomial logistic regression was performed to obtain adjusted odds ratios (AORs) and 95% confidence intervals (95% CIs), for modelling the probability of OW&OB as a function of time (year of measurement as covariate) and sex and age of subjects as factors. In 1991, girls at age 14 were used as reference categories, separately for OW&OB subsamples. The p-values <0.05 were considered statistically significant.

3 RESULTS

Table 1. *Prevalence of overweight children in Ljubljana from 1991 to 2011 by sex (in %).*
Tabela 1. *Prevalenca prekomerne prehranjenosti ljubljanskih otrok med 1991 in 2011 ločeno po spolu (v %).*

Year/ Leto	Sex/ Spol	Age (Years) Starost (Leta)								Total/ Skupaj
		7	8	9	10	11	12	13	14	
1991	Boys/ Fantje	**13.7**	**13.4**	**17.1**	**16.0**	**14.5**	**15.9**	**15.8**	**13.4**	**15.1**
	Girls/ Dekleta	**13.5**	**15.6**	**16.2**	**14.3**	**14.7**	**12.3**	**11.9**	**9.2**	**13.5**
1992	Boys/ Fantje	10.8	12.3	13.1	15.0	14.4	13.2	12.6	13.1	13.2
	Girls/ Dekleta	12.2	11.9	13.0	13.1	12.1	11.0	10.5	7.6	11.4
1993	Boys/ Fantje	13.6	14.3	15.7	15.9	16.9	16.3	14.0	13.6	15.1
	Girls/ Dekleta	14.8	14.6	14.1	14.6	13.4	12.3	10.3	8.8	12.7
1994	Boys/ Fantje	11.9	14.2	15.2	17.1	16.4	16.2	15.5	13.8	15.2
	Girls/ Dekleta	15.3	16.2	14.8	14.0	14.3	13.1	10.8	8.2	13.2
1995	Boys/ Fantje	15.1	15.9	14.4	16.6	15.6	17.3	15.0	14.1	15.5
	Girls/ Dekleta	15.8	15.4	16.2	15.4	14.0	12.1	12.4	8.6	13.7
1996	Boys/ Fantje	**10.4**	**15.1**	**15.9**	**15.2**	**15.9**	**17.1**	**15.5**	**15.6**	**15.3**
	Girls/ Dekleta	**14.2**	**15.0**	**16.5**	**15.9**	**14.7**	**13.6**	**12.3**	**10.5**	**14.1**
1997	Boys/ Fantje	13.5	13.9	15.8	15.0	16.2	15.5	15.2	13.9	15.0
	Girls/ Dekleta	14.6	17.1	15.7	16.2	14.2	13.2	10.5	9.2	13.9
1998	Boys/ Fantje	13.7	14.9	14.3	16.8	17.9	16.5	15.3	15.5	15.7
	Girls/ Dekleta	15.3	16.1	16.4	15.0	15.7	13.6	12.9	9.5	14.4
1999	Boys/ Fantje	11.6	16.4	17.0	16.6	17.5	17.0	15.2	13.4	15.8
	Girls/ Dekleta	17.5	16.9	16.8	17.2	14.2	14.6	12.2	9.6	14.8
2000	Boys/ Fantje	13.8	16.2	19.6	19.3	16.8	18.4	17.2	15.6	17.3
	Girls/ Dekleta	14.5	17.1	18.6	17.9	16.4	16.0	12.4	9.5	15.4
2001	Boys/ Fantje	**14.7**	**16.6**	**17.1**	**20.5**	**18.7**	**17.9**	**18.0**	**16.8**	**17.7**
	Girls/ Dekleta	**18.1**	**15.9**	**17.4**	**19.0**	**17.1**	**16.8**	**11.4**	**9.1**	**15.5**
2002	Boys/ Fantje	12.8	15.6	16.9	15.4	20.8	18.4	16.7	16.7	16.8

	Girls/ Dekleta	15.9	18.3	17.6	15.1	16.7	15.4	12.5	9.1	15.1
2003	Boys/ Fantje	14.0	14.1	17.0	17.9	18.1	19.5	16.6	13.0	16.4
	Girls/ Dekleta	13.7	16.8	17.3	18.4	14.5	15.6	12.6	12.6	15.2
2004	Boys/ Fantje	13.8	17.2	18.1	18.6	19.0	18.9	18.7	17.2	17.7
	Girls/ Dekleta	13.0	15.7	19.4	17.0	17.4	13.8	12.3	9.7	14.8
2005	Boys/ Fantje	13.0	15.6	20.0	17.5	19.7	21.0	18.9	19.0	18.1
	Girls/ Dekleta	13.6	15.1	17.6	16.9	16.5	16.5	10.4	12.8	15.0
2006	Boys/ Fantje	**12.1**	**16.5**	**19.3**	**21.5**	**18.8**	**18.8**	**19.3**	**19.1**	**18.0**
	Girls/ Dekleta	**14.6**	**16.5**	**17.1**	**17.9**	**18.2**	**15.4**	**13.9**	**10.5**	**16.1**
2007	Boys/ Fantje	11.8	15.6	18.2	18.6	23.2	20.3	19.9	16.5	18.0
	Girls/ Dekleta	16.5	19.0	18.0	17.3	16.1	15.8	14.3	11.6	16.1
2008	Boys/ Fantje	14.4	15.4	18.6	18.8	19.9	20.7	19.3	15.1	17.7
	Girls/ Dekleta	12.5	18.1	18.1	16.2	14.5	16.2	13.3	10.7	15.0
2009	Boys/ Fantje	13.3	17.7	16.6	18.8	21.0	20.6	20.1	18.1	18.3
	Girls/ Dekleta	14.7	15.7	19.0	18.4	16.1	14.3	14.2	13.5	15.7
2010	Boys/ Fantje	12.9	16.9	18.9	19.0	19.7	20.8	19.5	21.2	18.7
	Girls/ Dekleta	14.7	17.2	17.4	18.1	17.7	16.0	13.6	13.5	16.0
2011	Boys/ Fantje	**12.1**	**16.0**	**19.0**	**18.4**	**19.6**	**19.8**	**18.5**	**18.3**	**17.8**
	Girls/ Dekleta	**12.1**	**16.9**	**19.2**	**16.6**	**18.2**	**17.7**	**14.9**	**11.6**	**15.9**

Table 2. *Prevalence of obese children in Ljubljana from 1991 to 2011 by sex (in %).*
Tabela 2. *Prevalenca debelosti ljubljanskih otrok med 1991 in 2011 ločeno po spolu (v %).*

Year/ Leto	Sex/ Spol	Age (Years) Starost (Leta)								Total/ Skupaj
		7	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
1991	Boys/ Fantje	**3.2**	**3.9**	**2.8**	**3.5**	**3.0**	**3.0**	**2.2**	**1.5**	**2.9**
	Girls/ Dekleta	**3.9**	**4.0**	**2.6**	**2.7**	**1.3**	**1.7**	**1.1**	**0.6**	**2.2**
1992	Boys/ Fantje	2.9	3.1	2.6	1.9	2.8	2.2	1.9	1.7	2.3
	Girls/ Dekleta	3.8	3.3	2.2	2.1	1.9	1.0	0.9	0.5	1.9
1993	Boys/ Fantje	4.2	3.8	2.8	3.6	2.2	2.3	2.7	1.8	2.8
	Girls/ Dekleta	4.9	3.9	3.3	2.4	2.2	2.2	1.6	1.0	2.6
1994	Boys/ Fantje	4.8	3.7	3.4	3.3	3.3	2.9	2.6	2.1	3.2
	Girls/ Dekleta	3.6	2.7	3.2	2.9	2.2	1.5	2.0	1.7	2.4
1995	Boys/ Fantje	4.4	4.1	4.3	2.8	3.5	2.4	2.4	3.2	3.3
	Girls/ Dekleta	4.9	3.5	3.7	2.7	2.6	1.7	1.2	1.7	2.7

1996	Boys/ Fantje	**3.2**	**4.7**	**4.7**	**4.2**	**3.8**	**2.8**	**2.8**	**3.2**	**3.7**
	Girls/ Dekleta	**5.2**	**4.7**	**3.7**	**3.4**	**3.1**	**2.9**	**2.3**	**1.7**	**3.3**
1997	Boys/ Fantje	4.9	3.6	4.8	4.3	3.4	2.9	2.2	1.9	3.5
	Girls/ Dekleta	4.1	4.2	3.9	3.1	2.7	2.6	2.0	0.7	2.9
1998	Boys/ Fantje	5.7	6.1	3.7	4.6	4.1	4.0	3.1	2.1	4.1
	Girls/ Dekleta	5.3	4.7	4.8	3.5	2.7	2.9	1.7	2.5	3.5
1999	Boys/ Fantje	4.0	5.3	4.7	3.7	4.6	4.7	3.6	2.4	4.2
	Girls/ Dekleta	5.1	5.2	4.2	3.8	2.8	1.9	2.0	1.7	3.2
2000	Boys/ Fantje	5.8	3.4	3.9	4.8	4.0	4.2	3.3	3.5	4.0
	Girls/ Dekleta	5.9	4.4	5.3	3.4	2.3	1.8	1.6	1.3	3.2
2001	Boys/ Fantje	**5.2**	**5.7**	**4.4**	**3.2**	**5.2**	**3.0**	**3.2**	**3.3**	**4.1**
	Girls/ Dekleta	**5.2**	**4.7**	**3.8**	**4.0**	**2.7**	**2.2**	**2.0**	**1.2**	**3.1**
2002	Boys/ Fantje	4.7	4.8	4.8	4.0	3.6	4.3	2.7	3.0	3.9
	Girls/ Dekleta	4.2	4.6	3.4	2.8	3.8	1.9	2.0	2.1	3.1
2003	Boys/ Fantje	4.3	5.1	4.6	3.3	3.3	3.8	3.5	2.6	3.8
	Girls/ Dekleta	4.6	4.3	4.2	2.7	1.9	2.4	1.7	1.0	2.8
2004	Boys/ Fantje	4.5	5.0	3.5	5.3	4.8	3.6	4.4	4.5	4.5
	Girls/ Dekleta	3.2	4.7	3.7	3.8	2.8	2.4	1.8	1.4	3.0
2005	Boys/ Fantje	4.9	4.4	5.3	5.2	4.9	5.1	4.2	3.6	4.7
	Girls/ Dekleta	3.6	4.0	3.6	4.0	3.3	2.6	2.0	1.4	3.1
2006	Boys/ Fantje	**4.8**	**5.8**	**5.0**	**5.6**	**5.4**	**6.2**	**5.0**	**4.2**	**5.4**
	Girls/ Dekleta	**7.0**	**4.4**	**4.8**	**3.9**	**3.5**	**3.3**	**2.7**	**2.2**	**4.1**
2007	Boys/ Fantje	5.8	5.3	5.5	4.9	5.0	3.9	5.3	5.4	5.1
	Girls/ Dekleta	3.4	5.4	3.0	4.6	3.7	2.9	2.6	2.3	3.5
2008	Boys/ Fantje	5.8	6.0	6.0	5.5	4.9	6.9	4.4	5.9	5.7
	Girls/ Dekleta	4.8	4.6	6.2	2.7	3.6	2.3	2.6	2.2	3.7
2009	Boys/ Fantje	5.1	6.1	5.7	5.6	5.4	6.1	5.7	5.0	5.6
	Girls/ Dekleta	4.3	5.0	4.2	4.0	3.0	3.5	2.9	2.1	3.6
2010	Boys/ Fantje	5.1	7.2	6.2	6.6	6.4	5.6	6.4	5.3	6.1
	Girls/ Dekleta	4.4	5.0	4.3	4.0	5.2	2.7	3.3	2.7	3.9
2011	Boys/ Fantje	**4.8**	**5.4**	**6.3**	**6.4**	**5.8**	**5.7**	**6.9**	**5.2**	**5.8**
	Girls/ Dekleta	**4.1**	**4.8**	**4.1**	**3.9**	**3.8**	**3.6**	**2.5**	**2.6**	**3.7**

The prevalence of OW&OB (%) between 1991 and 2011 when the entire sample (n = 376,719) is considered, irrespective of the boys' and girls' ages, is presented in Tables 1 and 2. The prevalence of OW&OB showed some small fluctuations but with significant trends of increasing. The proportion of overweight boys grew from 15.1% (n = 1,839; 95% CI: 14.5–15.8) in 1991 to 17.8% (n = 1,372; 95% CI: 16.9–18.6) in 2011 and obese boys from 2.9% (n = 352; 95% CI: 2.6–3.2) to 5.8% (n = 450; 95% CI: 5.3–6.4). The proportion of overweight girls grew from 13.5% (n = 1,528; 95% CI: 12.9–14.2) to 15.9% (n = 1,156; 95% CI: 15.1–16.7) and obese girls from 2.2% (n = 246; 95% CI: 1.9–2.5) to 3.7% (n =266; 95% CI: 3.2–4.1) respectively. In all observed years, the prevalence of OW&OB was significantly higher among boys than among girls.

In recent years, it has been observed that the 9- to 13-year age group represents the largest proportion of OW&OB boys (between 23% and 26%), whereas among girls the highest proportions of OW&OB are observed among the 8- to 12-year age group (between 20% and 23%). The lowest percentage of OW&OB is observed among 7-year-old boys and 14-year-old girls.

Table 3. *Adjusted odds ratios (AOR; with 95% CI) in multinomial regression model for the prediction of overweight and obesity.*

Tabela 3. *Prilagojena razmerja obetov (AOR; s 95% intervalom zaupanja) in multinominalni regresijski model za napovedovanje prekomerne prehranjenosti in debelosti.*

Observed category/ opazovani dejavniki	Reference category/ referenčne kategorije	AOR (95% CI) – overweight/ prekomerna prehranjenost	p	AOR (95% CI) – obese/ debelost	p
Year of survey/ Leto meritev:					
2011	1991	1.017 (1.016–1.019)	<0.001	1.037 (1.034–1.04)	<0.001
Sex/Spol:					
Boys/Fantje	Girls/Dekleta	1.17 (1.15–1.20)	<0.001	1.39 (1.35–1.44)	<0.001
Age/Starost:					
7 years/let	14 years/let	1.09 (1.05–1.14)	<0.001	1.92 (1.78–2.07)	<0.001
8 years/let	14 years/let	1.29 (1.24–1.34)	<0.001	2.01 (1.86–2.16)	<0.001
9 years/let	14 years/let	1.39 (1.34–1.44)	<0.001	1.84 (1.70–1.98)	<0.001
10 years/let	14 years/let	1.39 (1.34–1.44)	<0.001	1.68 (1.56–1.81)	<0.001
11 years/let	14 years/let	1.36 (1.31–1.41)	<0.001	1.53 (1.42–1.66)	<0.001
12 years/let	14 years/let	1.31 (1.26–1.35)	<0.001	1.36 (1.26–1.47)	<0.001
13 years/let	14 years/let	1.15 (1.11–1.19)	<0.001	1.18 (1.09–1.28)	<0.001

The multinomial logistic regression model (Table 3) for the prediction of OW&OB with the sex and age of subjects as factors and year of measurement as covariate was found to be highly significant (χ^2=289, p<.001). In every year from 1991 to 2011, the odds for OW&OB increased by 1.7% (95% CI: 1.6–1.9) and 3.7% (95% CI: 3.4–4) respectively. Boys have 1.17 (95% CI: 1.15–1.20) times higher odds of becoming overweight and 1.39 (95% CI: 1.35–1.44) times higher odds of becoming obese than girls. In comparison to reference group (age of 14), the highest odds for being overweight was found at the ages of nine and ten (AOR=1.39; 95% CI: 1.34–1.44), while for obesity the highest odds were at the age of eight years (AOR=2.01; 95% CI: 1.86–2.16).

4 DISCUSSION

The main finding of our study is that during 1991−2011, OW&OB became clearly more prevalent in children from Ljubljana with the only real exception at the beginning of the studied period, which is probably due to a significant migration of the population after the

establishment of the new state of Slovenia in 1991 (37).

The increase in the proportion of OW&OB children in developed countries is a result of the different ways young people spend their free time, characterised mainly by physical inactivity (2) and inappropriate diets marked by energy-rich food and unsuitable eating habits (14, 16, 38). Furthermore, in Slovenia the volume of free-time physical activities gradually decreases with age (39–41) and the food intake pattern (skipping breakfast and drinking soft-drinks daily) deviates markedly from healthy eating patterns (16).

After 1990, the prevalence of OW&OB children aged around 7 to 11 years (using the IOTF cut-off points) was especially high in southern Europe (Italy 36%, Spain 34%, Greece 31%) and substantially lower in northern Europe (Netherlands 12%, Denmark 15%, Germany 16%) (11). In the 2006 HBSC study (based on self-reporting), the prevalence of overweight among 11-, 13- and 15-year-olds was similar among Central, Eastern and Northern-European (10.3% to 11.7%) regions and much higher in the Southern-European region (14). The same patterns were seen also in the 2009/2010 HBSC study (16): the highest rates of OW&OB among 11- and 13-year-olds were seen in North America (around 30%) but prevalence was also high in Southern (Greek boys 26.3% and girls 15.3%; Portuguese boys 24.7% and girls 16%; Italian boys 21.3% and girls 13%) and some Eastern European countries (Polish boys 20.7% and girls 13.3%). In the PRO Children Survey, parents reported height and weight of children and BMI values were analysed using the US Centres of Disease Control and Prevention and the IOTF reference populations (15). They found that in 2003 the prevalence of OW&OB among 11-years olds between the nine European countries varied from 8.6% to 30.6% and 5.9% to 26.5% respectively, depending on the reference population, with the lowest prevalence in Dutch girls and the highest in Portuguese boys. Obesity prevalence varied from 1.1% (Dutch and Danish girls) to 10.7% (Portuguese boys) and from 0.3% (Dutch girls) to 6.2% (Portuguese boys) respectively. In 2009, more 11- and 13-years old girls and boys from Ljubljana were overweight or obese in comparison with the Slovenian sub-sample in the 2009/2010 HBSC study (11-year-old girls 19.1% vs. 16%; 13-year-old girls 17.1% vs. 13%; 11-year-old boys 26.4% vs. 22%; 13-year old boys 25.8% vs. 20% respectively) (16). The results of this study are not directly comparable with the results of the HBSC Studies (14, 16) and the PRO Children Survey (15), while self-reported weight and height could have resulted in some underreporting of (over)weight (42). Among Ljubljana's girls, the highest increase of OW&OB rates was observed between 1991–1996 and

2001–2005, while among boys between 1996–2001 and 2006–2011. The reasons for these differences are unclear. Nevertheless, we can conclude that the prevalence of OW&OB among Ljubljana's juvenile population, its secular trends and pattern of changes from childhood to early adolescence are lower to those in the USA (4, 16), Ireland (18) and countries from the southern European region (Portugal, Spain, Italy, Greece, Malta) (11, 15, 16, 43) and higher than in the northern (Denmark, Finland, Sweden) (15, 16, 24, 44) and central European region (Austria, Germany, Netherlands) (15, 16).

Moreover, in the twenty-year period, the increase of prevalence of OW&OB among children from Ljubljana is lower in comparison with the Slovenian population (30). In 1991, more boys from Ljubljana were OW&OB compared with the Slovenian population of the same ages (Ljubljana 18% vs. the rest of Slovenia 15.9%), while in 2011 contrary data were observed (Ljubljana 23.6% vs. the rest of Slovenia 27.9%). There were small differences among girls from Ljubljana and girls from the rest of Slovenia in 1991 (15.7% vs. 15.5%), while in 2011 the prevalence of OW&OB is much higher among girls from the rest of Slovenia than among their counterparts from Ljubljana (24.6% vs. 19.6% respectively). A possible explanation for the less prominent changes in BMI among Ljubljana's school population obviously lies in the changes in living habits, including more opportunities for physical activity and healthier nutrition. As the capital city, Ljubljana has the highest rate of GDP per capita (33) and the highest number of sport clubs (45); in the previous four years, between 60 and 70 PE teachers have been employed in sport clubs and paid by the municipality to ensure free access to sport programmes for children and youth (45). Although we cannot infer causality from this study, our results may also indicate that changes in the environment have not similarly affected all age groups and the juvenile population living in different environments (urban, sub-urban and rural).

Between 2010 and 2011, the prevalence of OW&OB in Ljubljana's population, especially among girls, may have reached a plateau, as in some other countries (4, 44, 46).

In 7-year-old children, the secular trend was less prominent. In boys, the prevalence of OW&OB showed no trend during the past 20 years (16.9%) and among girls the prevalence was still decreased (17.4% vs. 16.2% respectively). Similar findings have been reported among pre-school children in the Czech Republic, France, the Netherlands and Sweden (47, 48). It may be that 7-year-old children have retained their need for spontaneous physical activity and they do not spend so much time watching television and using other electronic devices (24).

In recent years, the lowest percentage of OW&OB is observed among 14-year-old girls. Girls have been become slimmer in adolescence, most probably as a result of attention to foods as a way to meet nutritional recommendations (16).

Obesity is rising at higher rates than overweight (odds 1.7% vs. 3.7% per year respectively), especially among boys. Interestingly, the physical activity level among primary school boys is still higher than among girls, but the level of their physical fitness has declined in previous decades, in comparison with girls (40). Moreover, the highest proportion of children with excessive weight is observed particularly in the period between the ages of 10 and 13, when young people have the best conditions available for sports activities in schools (three hours of PE per week; PE is taught by specialised PE teachers in good working conditions with a smaller number of children in a group, etc.) and still show an interest in free-time sports participation in sports clubs (40). Although there is a close correlation between the amount of body fat and BMI (49), it is not possible to make an exact prediction of excessive weight on the basis of BMI, because a higher BMI can be the result of a higher proportion of fat mass or muscle mass (50). It has been suggested that the reference values of the IOTF for a specific age group are not particularly suitable. This anomaly of the BMI distribution found on the studied population is also characteristic of other populations (51). For this reason, Starc and Strel (13) suggested that the nationally-specific BMI cut-off points, based on more recent data than international references, would be appropriate for defining underweight, overweight and obesity in Slovenian school-aged population.

The findings about differences between boys and girls in prevalence of OW&OB as defined by BMI are generally inconsistent (4, 8, 17–21, 23, 24) and may result from differences in biology (sex differences) or those assumed to be due to society or culture (gender differences), or a combination of the two (25, 52). However, more Ljubljana boys are overweight (from 13.2% to 18.7% vs. 11.4% to 16.1%) and obese (from 2.2% to 6.1% vs. 1.9% to 4.1%) than girls in all age groups in all observed years. Furthermore, a comparison with Škerlj's data (53) showed that between 1939 and 2011 the BMI among 11- to 19-year olds from Ljubljana increased on average by 32.6% among boys and 21.4%, among girls respectively (12). Our results are similar to the data from the HBSC studies (14, 16) and previous studies from SLOFIT system data (26, 27, 30), while Planinšec and Fošnarič (28) found no differences in the prevalence of OW&OB among 6- to 12-year-old children of Slovenia (boys 18.3% and 6.5%, girls 18.5% and 6.7% respectively).

There are some limitations of the study. After 1996 (when new education legislation was accepted) only healthy students wishing to participate and having the written consent of their parents are included in SLOFIT system. According to annual reports, slightly less than 95% of primary school boys and girls below the age of 15 were measured every year. Nevertheless, the sampling procedure was the same throughout the study. Therefore, there is no reason for the described trends not to apply to the entire population of Ljubljana.

Note also that as almost entire population of students were included, the confidence intervals as evaluated by Collett formula are actually narrower (more precise) than reported in the results of this study.

5 CONCLUSION

Enormous socio-political and economic changes in Slovenia in the last 20 years have strongly influenced the lifestyles, nutritional habits of children and youth and their physical development (37–41). Clearly, the prevalence of OW&OB is also taking on epidemic proportions in Ljubljana's school population. Obesity is growing at higher rates than overweight, especially among boys. Obesity in childhood often follows into adulthood (27, 54), which further supports the importance of preventing childhood obesity. More efficient management of the ever-increasing problem of OW&OB requires a comprehensive, multi- and inter-disciplinary approach as well as the establishment of a supportive environment that will encourage and ensure healthy conduct of children and youth. An efficient approach necessitates systemic measures from all competent authorities, a transformation of the health system into one supporting the prevention of illness and the cooperation of nutritional and other experts and media. Adequate education and the promotion of a healthy lifestyle needs to be included into formal and informal education, as the establishment of healthy decision-making patterns and a healthy lifestyle for all age groups is a prerequisite for alleviating the problem of OW&OB (55). Therefore, certain measures are suggested such as public interventions focused on changing dietary intake and physical activity, safeguarding the school neighbourhood so that children can walk or cycle to and from school, maintenance of playgrounds near the school thus allowing for spontaneous physical activity, an improvement in the quality of PE, e.g. a smaller number of children per teacher in the first few years of education, involving the combined teaching of general teachers and PE teachers (56, 57), and free access to out-of school sport programmes for all children. However, it is also vital that parents ensure healthy eating habits and limit children's time spent in front of television and computer screens.

References

1. Ferreira I, van der Horst K, Wendel-Vos W, Kremers S, van Lenthe FJ, Brug J. Environmental correlates of physical activity in youth: a review and update. Obes Rev 2007; 8: 129-54.
2. Hills AP, Andersen LB, Byrne NM. Physical activity and obesity in children. Br J Sports Med 2011; 45: 866-70.
3. Steinbeck KS. The importance of physical activity in the prevention of overweight and obesity in childhood: a review and an opinion. Obes Rev 2001; 2: 117-30.
4. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. JAMA 2012; 307: 483-90.
5. Wang Y, Lobstein T. Worldwide trends in childhood overweight and obesity. Int J Pediatr Obes 2006; 1: 11-25.
6. Wijnhoven TM, van Raaij JM, Spinelli A, Rito AI, Hovengen R, Kunesova M et al. WHO European Childhood Obesity Surveillance Initiative 2008: weight, height and body mass index in 6-9-year-old children. Pediatr Obes 2013; 8: 79-97.
7. Dehghan M, Akhtar-Danesh N, Merchant AT. Childhood obesity, prevalence and prevention. Nutr J 2005; 4: 24.
8. Stamatakis E, Primatesta P, Chinn S, Rona R, Falascheti E. Overweight and obesity trends from 1974 to 2003 in English children: what is the role of socioeconomic factors? Arch Dis Child 2005; 90: 999-1004.
9. Mokdad AH, Ford ES, Bowman BA, Dietz WH, Vinicor F, Bales VS et al. Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. JAMA 2003; 289: 76-9.
10. Reilly JJ. Descriptive epidemiology and health consequences of childhood obesity. Best Pract Res Clin Endocrinol Metab 2005; 19: 327-41.
11. Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. Obes Rev 2004; 5(Suppl 1): 4-104.
12. Storch EA, Milsom VA, Debraganza N, Lewin AB, Geffken GR, Silverstein JH. Peer victimization, psychosocial adjustment, and physical activity in overweight and at-risk-for-overweight youth. J Pediatr Psychol 2007; 32: 80-9.
13. Starc G, Strel J. Is there a rationale for establishing Slovenian body mass index references of school-aged children and adolescents? Anthrop Notebooks 2011; 17: 89-100.
14. Haug E, Rasmussen M, Samdal O, Iannotti R, Kelly C, Borraccino A et al. Overweight in school-aged children and its relationship with demographic and lifestyle factors: results from the WHO-Collaborative Health Behaviour in School-aged Children (HBSC) study. Int J Public Health 2009; 54(Suppl 2): 167-79.
15. Yngve A, De Bourdeaudhuij I, Wolf A, Grjibovski A, Brug J, Due P et al. Differences in prevalence of overweight and stunting in 11-year olds across Europe: The Pro Children Study. Eur J Public Health 2008; 18: 126-30.
16. Currie C, Zanotti C, Morgan A, Currie D, de Looze M, Roberts C et al. Social determinants of health and well-being among young people. Health behaviour in school-aged children (HBSC) study: international report from the 2009/2010 survey. Copenhagen: WHO Regional Office for Europe, 2012.
17. Peckham CS, Stark O, Simonite V, Wolff OH. Prevalence of obesity in British children born in 1946 and 1958. Br Med J 1983; 286: 1237-42.
18. Whelton H, Harrington J, Crowley E, Kelleher V, Cronin M, Perry IJ. Prevalence of overweight and obesity on the island of Ireland: results from the North South Survey of Children's Height, Weight and Body Mass Index, 2002. BMC Public Health 2007; 7: 187.
19. Moreno L, Sarria A, Fleta J, Rodriguez G, Bueno M. Trends in obesity among children in Aragon (Spain) 1985 to 1995. Int J Obes Relat Metab Disord 1998; 19: S7.
20. Holmback U, Fridman J, Gustafsson J, Proos L, Sundelin C, Forslund A. Overweight more prevalent among children than among adolescents. Acta Paediatr 2007; 96: 577-81.
21. Yuca SA, Yilmaz C, Cesur Y, Dogan M, Kaya A, Basaranoglu M. Prevalence of overweight and obesity in children and adolescents in eastern Turkey. J Clin Res Pediatr Endocrinol 2010; 2: 159-63.
22. Elmadfa I, Godina-Zarfl B, König J, Dichtl M, Faist V. Prevalence of overweight and plasma lipids in 7-18 year old Austrian children and adolescents. Int J Obes Relat Metab Disord 1993; 17: S35.
23. Maffeis C, Schutz Y, Piccoli R, Gonfiantini E, Pinelli L. Prevalence of obesity in children in north-east Italy. Int J Obes Relat Metab Disord 1993; 17: 287-94.
24. Vuorela N, Saha MT, Salo MK. Change in prevalence of overweight and obesity in Finnish children: comparison between 1974 and 2001. Acta Paediatr 2011; 100: 109-15.
25. Sweeting HN. Gendered dimensions of obesity in childhood and adolescence. Nutr J 2008; 7: 1.
26. Leskošek B, Strel J, Kovač M. Overweight and obesity in Slovenian schoolgirls, 1991-2006. Coll Antropol 2010; 34: 1303-8.
27. Starc G, Strel J. Tracking excess weight and obesity from childhood to young adulthood: a 12-year prospective cohort study in Slovenia. Public Health Nutr 2011; 14: 49-55.
28. Planinšec J, Fošnarič S. Body mass index and triceps skinfold thickness in prepubertal children in Slovenia. Coll Antropol 2009; 33: 341-5.
29. Avbelj M, Saje-Hribar N, Seher-Zupančič M, Brcar P, Kotnik P, Iršič A et al. Overweight and obesity prevalence among 5-year-old children and 15- to 16-year-old adolescents in Slovenia. Zdrav Vestn 2005; 74: 753-9.
30. Kovač M, Jurak G, Leskošek B. The prevalence of excess weight and obesity in Slovenian children and adolescents from 1991 to 2011. Anthrop Notebooks 2012; 18: 91-103.
31. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. Pediatrics 1998; 101: 518-25.
32. Singh AS, Mulder C, Twisk JW, van Mechelen W, Chinapaw MJ. Tracking of childhood overweight into adulthood: a systematic review of the literature. Obes Rev 2008; 9: 474-88.
33. Slovene Municipalities in Numbers. Statistical Office of Republic of Slovenia. Available May 5, 2013 at: http://www.stat.si/ObcineVStevilkah/Vsebina.aspx?leto=2011&id=82&lang=eng.
34. Strel J, Ambrožič F, Kondrič M, Kovač M, Leskošek B, Štihec J et al. Sports Educational Chart. Ljubljana: Ministry of Education and Sport, 1997.
35. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. BMJ 2000; 320: 1240-3.
36. Collett D. Modelling binary data. London: Chapman and Hall, 1991.
37. Pušnik M, Starc G. An entertaining (r)evolution: the rise of television in socialist Slovenia. Media Cult Soc 2008; 30: 777-93.
38. Kobe H, Štimec M, Ribič CH, Fidler Mis N. Food intake in Slovenian adolescents and adherence to the Optimized Mixed Diet: a nationally representative study. Public Health Nutr 2012; 15: 600-8.
39. Jurak G. Sporting lifestyle vs. 'cigarettes & coffee' lifestyle of Slovenian high school students. Anthrop Notebooks 2006; 12: 79-95.
40. Strel J, Kovač M, Jurak G. Physical and motor development, sport activities and lifestyles of Slovenian children and youth: changes in the last few decades In: Brettschneider WD, Naul R, editors. Obesity in Europe: young people's physical activity and sedentary lifestyles. Frankfurt am Main: Peter Lang, 2007: 243-64.
41. Starc G, Strel J, Kovač M. Telesni in gibalni razvoj slovenskih otrok in mladine v številkah. Šolsko leto 2007/08. Ljubljana: Faculty of Sport, 2010.
42. Brener ND, McManus T, Galuska DA, Lowry R, Wechsler H. Reliability and validity of self-reported height and weight among high school students. J Adolesc Health 2003; 32: 281-7.

43. Ferreira RJ, Marques-Vidal PM. Prevalence and determinants of obesity in children in public schools of Sintra, Portugal. Obesity (Silver Spring) 2008; 16: 497-500.

44. Sjoberg A, Lissner L, Albertsson-Wikland K, Marild S. Recent anthropometric trends among Swedish school children: evidence for decreasing prevalence of overweight in girls. Acta Paediatr 2008; 97: 118-23.

45. Yearly sport program of the Municipality of Ljubljana. Available Mar 15, 2013 at: www.ljubljana.si/si/mol/mestna-uprava/oddelki/sport/.

46. Stamatakis E, Wardle J, Cole TJ. Childhood obesity and overweight prevalence trends in England: evidence for growing socioeconomic disparities. Int J Obes 2010; 34: 41-7.

47. Cattaneo A, Monasta L, Stamatakis E, Lioret S, Castetbon K, Frenken F et al. Overweight and obesity in infants and pre-school children in the European Union: a review of existing data. Obes Rev 2010; 11: 389–98.

48. Eriksson M, Rasmussen F, Nordqvist T. Changes in shape and location of BMI distributions of Swedish children. Acta Paediatr 2005; 94: 1558–65.

49. Daniels SR, Khoury PR, Morrison JA. The utility of body mass index as a measure of body fatness in children and adolescents: differences by race and gender. Pediatrics 1997; 99: 804-7.

50. Shephard RJ. The obesity epidemic: a challenge to pediatric work physiologists. Pediatric Exercise Sci 2005; 17: 3-17.

51. Rolland-Cachera MF, Cole TJ, Sempe M, Tichet J, Rossignol C, Charraud A. Body Mass Index variations: centiles from birth to 87 years. Eur J Clin Nutr 1991; 45: 13-21.

52. Krieger N. Genders, sexes, and health: what are the connections- and why does it matter? Int J Epidemiol 2003; 32: 652-7.

53. Škerlj B. Splošna antropologija v osnovnih potezah. Ljubljana: Državna založba Slovenije, 1948.

54. Whitaker RC, Wright JA, Pepe MS, Seidel KD, Dietz WH. Predicting obesity in young adulthood from childhood and parental obesity. N Engl J Med 1997; 337: 869-73.

55. Artnik B, Bajt M, Bilban M, Borovničar A, Brguljan J, Djomba JK et al. Zdravje in vedenjski slog prebivalcev Slovenije: trendi v raziskavah CINDI 2001-2004-2008. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije, 2012.

56. Jurak G, Kovač M, Strel J. Influence of the enhanced physical education curriculum on the physical fitness of children. Croat J Edu 2012; 13: 41-70.

57. Starc G, Strel J. Influence of the quality implementation of a physical education curriculum on the physical development and physical fitness of children. BMC Public Health 2012; 12: 61.

THE LOCAL HELP NETWORK TO THE HOMELESS: CASE STUDY OF THE CITY OF KOPER, SLOVENIA
LOKALNA MREŽA POMOČI BREZDOMNIM: PRIKAZ PRIMERA MESTA KOPER, SLOVENIJA

Blaž Matija Geršak[1], Klara Praprotnik[1], Milan Krek[2]

Abstract

Aim: To present the work of professionals and volunteers of the local help network that revolves around trying to help the homeless and to stimulate readers to critically assess the possible methods aimed towards the successful integration of those people into society.

Methods: In the city of Koper, we visited five governmental (GOs) and non-governmental organisations (NGOs): Red Cross Koper, Daybreak Association, Center for Social Work Koper, Diocesan Caritas Koper and Koper Prison; and interviewed 3-10 staff members at each organisation.

Results: For each organisation, we described its duties and activities, including its interconnection with other organisations, methods of integrating the homeless into the society and the personal thoughts of its staff members.

Conclusions: Both GOs and NGOs are necessary for providing effective assistance to people in need. NGOs excel at quickly responding to immediate needs. Their programs are usually implemented only as short-term resolutions. GOs on the other hand require a longer time to implement their concepts. Nonetheless, in contrast to NGO projects, they provide long-term stability. Even though people from remote parts of the society usually cooperate, the efforts of those who work with them are nothing short of exerting. They strive to achieve a general social acceptance of their ward population, which is the one thing those people need the most. Since only the society is truly capable of offering them a firm stepping stone towards escaping from the vicious circle in which they stray.

Key words: homelessness, social integration, support services, qualitative study

Izvleček

Cilj: Predstaviti delo strokovnega osebja in prostovoljcev lokalne mreže pomoči brezdomnim ter spodbuditi bralce h kritičnemu razmišljanju o mogočih načinih reševanja problema vključitve teh ljudi v družbo.

Metode: V Kopru smo obiskali pet vladnih in nevladnih organizacij: Rdeči križ Koper, Društvo Svit, Center za socialno delo Koper, Škofijsko Karitas Koper in Zavod za prestajanje kazni zapora Koper; pri vsaki organizaciji smo izvedli intervju z od 3 do 10 strokovnimi sodelavci ali prostovoljci.

Rezultati: Za vsako organizacijo smo opisali, katere naloge in dejavnosti opravlja, vključno s tem, kako se povezuje z drugimi organizacijami, kakšni so njeni načini vključitve brezdomnih v družbo ter kakšna so osebna opažanja njenega osebja o dejavnostih organizacije in uspešnosti dela, ki ga opravlja.

Zaključki: Vladne in nevladne organizacije so potrebne za učinkovito pomoč ljudem v stiski. Nevladne se odzovejo takoj; njihovi programi so ponavadi uporabljeni le kot kratkotrajne rešitve težav. Vladne organizacije pa se v primerjavi z nevladnimi odzovejo z zamikom; njihovi projekti z dlje časa trajajočim delovanjem ustvarjajo dolgotrajno stabilnost. Kljub sodelovanju ljudi iz obrobja družbe je delo posameznikov, ki z njimi delajo, zelo naporno in izčrpno. Stremijo k temu, da bi ogroženo populacijo družba bolje sprejela, kar je nekaj, kar ti ljudje najbolj potrebujejo. Samo družba je namreč tista, ki jim lahko nudi učinkovit izhod iz začaranega kroga, v katerem blodijo.

Ključne besede: brezdomstvo, socialna integracija, podporne storitve, kvalitativna študija

---

[1] University of Ljubljana, Medical Faculty, Department of Public Health, Zaloška 4, 1000 Ljubljana, Slovenia; authors are undergraduate students of medicine and have equally participated in the study

[2] Regional Institute of Public Health Koper, Vojkovo nabrežje 4a, 6000 Koper, Slovenia

Correspondence to: e-mail: blaz.gersak@maat.si

1 INTRODUCTION

Every social system limits some people the access to important socioeconomic resources. It also denotes their feeble efforts to counter the abysmal luck as their own wrong decisions. Stressing the importance of one's own choices that direct the life of a poor man therefore equals uttermost blindness of the ignorant observer and a twisted understanding of the issue of homelessness [1].

The homeless are people without any economic possessions or a place of residence legally considered their own [2]. According to European Classification of homelessness (ETHOS, 2004), four fundamental categories of homelessness exist. Those are: a) shelterlessness / rooflessness (sleeping under the open sky), b) houselessness (sleeping rough or using public or private shelters), c) insecure housing (risk of houselessness) and d) living in concealed houselessness / inadequate housing (at a relative's or friend's place; applicable also to otherwise homeless inmates temporarily residing in a correctional facility) or substandard housing situations [3].

The first two categories represent visible or street homelessness. The second two categories fall into concealed or less visible homelessness. Distinguishing between the two forms and understanding them is of towering importance as concealed frequently leads to visible homelessness [1].

In Slovenia, the problem of homelessness does exist, and the government began facing the issue primarily after Slovenia's independence in 1991. Nonetheless, a negligible amount of reliable data concerning this topic exists [4, 5]. It is estimated that the occurrence of homelessness in the population is about 4-5 per 10000 [6]. With the economic crisis that has arisen in the last few years, the occurrence of new-found homelessness began to increase rapidly. Unfortunately, according to FEANTSA – European Federation of National Organisations Working with the Homeless – Slovenia is one of the EU members that has not yet begun to develop strategic policies regarding homelessness, and as such the services aimed at counteracting it are as of yet not well developed [5].

It is estimated that the concentration of homeless individuals [7] and families living in substandard conditions [8] on the coast of Slovenia is considerably higher than the national average. Concurrently, a relatively high number of different organisations, the work of which either focuses on or includes homeless individuals and families, is acting in this same geographical and organisational area (Koper - the main seaport of Slovenia, located near the border with Italy; population 50,700 in year 2008).

The goal of our study was to analyse all measures implemented by the help network to the homeless in the city of Koper, with the purpose of preparing solid methodological foundations for later evaluation of the effectiveness (results) of those measures.

2 METHODS

The study was designed as an ethnographic, qualitative study [9]. We analysed the work of the professional staff as well as volunteers of the local help network to the homeless in the city of Koper. We visited the network of organisations the work of which revolves around trying to help the homeless (and other people in need). The focus of our analysis was the duties and activities of each of these organisations.

We analysed 5 organisations that among other aims aspire to reintegrate homeless individuals back into the broader society (Table 1).

Table 1.   The five studied organisations.
Tabela 1. Pet v študiji preučenih organizacij.

Organisation/ Organizacija	Brief description/ Kratek opis	Govern-mental/ Državna	Parent organisation/ Starševska organizacija	Funding/ Financiranje	Staff/ Osebje
Red Cross Koper (RCK)/ Rdeči križ Koper	central local institution to which the homeless can turn to for social help or financial assistance/ centralna lokalna inštitucija, na katero se lahko brezdomni obrnejo za socialno pomoč ali finančno podporo	no/ ne	Red Cross Association of Slovenia/ Rdeči Križ Slovenije	voluntary donations, various activities and campaigns of RCK are fundamentally supported also by the Koper municipality/ prostovoljne donacije, različne aktivnosti in kampanije Rdečega Križa Koper so temeljno podprte tudi s strani Mestne občine Koper	one salaried regularly employed activities and finances organizer, varying number of unpaid volunteers/ en plačan, redno zaposlen organizator aktivnosti in financiranja, spremenljivo število neplačanih prostovoljcev

Daybreak Association (Društvo Svit in slovenian; abbrev. Daybreak)/ Društvo Svit	independent humanitarian organization acting in the field of drug addiction since 1992/ neodvisna humanitarna organizacija, delujoča na področju odvisnosti od drog od leta 1992	no/ ne	none/ nobena	Republic of Slovenia, Ministry of health (80%), Koper municipality (20%)/ Republika Slovenija, Ministrstvo za zdravje (80%), Mestna občina Koper (20%)	6 regularly employed salaried main team members, 3 additional team members paid by the Employment Service of Slovenia (public works), varying number of unpaid volunteers/ 6 redno zaposlenih, plačanih članov glavne ekipe, 3 dodatni člani ekipe, plačani s strani Zavoda Republike Slovenije za zaposlovanje (javna dela), spremenljivo število neplačanih prostovoljcev
Center for Social Work Koper (CSWK)/ Center za socialno delo Koper	organization that focuses on the abolishment of regional socioeconomic distress and execution of preventive measures aimed at diminution of the causation leading to it/ organizacija, ki se osredotoča na izkoreninjanje regionalnih socioekonomskih stisk ljudi ter izvršbo preventivnih ukrepov, usmerjenih v zmanjševanje vzrokov zanje	yes/ da	Republic of Slovenia, Ministry of Labour, Family, Social Affairs and Equal Opportunities/ Republika Slovenija, Ministrstvo za delo, družino, socialne zadeve in enake možnosti	parent organization/ starševska organizacija	varying number of administrative staff members and social workers/ spremenljivo število članov administrativnega osebja in socialnih delavcev
Diocesan Caritas Koper (DCK)/ Škofijska Karitas Koper	regional Caritas unit with the mission of working to build a better world in any way necessary, especially for the poor and oppressed/ regionalna enota Karitasa, naloga katere je izgradnja boljšega sveta na kakršenkoli način, posebno za revne in zatirane	no/ ne	Caritas Internationalis/ Mednarodna Karitas	direct financing from the Vatican, larger charity grants from governments of countries in which it acts, lotteries and charity projects organized by various parties, smaller humanitarian donations from local sources (individuals, smaller companies)/ neposredno financiranje iz Vatikana, večji dobrodelni skladi iz proračuna držav, kjer organizacija deluje, loterije in dobrodelni projekti, izvedeni s strani različnih organizatorjev, manjše humanitarne donacije iz lokalnih virov (posamezniki, manjša podjetja)	varying number of Catholic church officials, varying number of volunteers/ spremenljivo število uradnikov Katoliške cerkve, spremenljivo število prostovoljcev

Koper Prison (KP)/ Zapor Koper	national competent agency which executes the punishment of imprisonment, mainly specializing in economic sentences/ nacionalna kompetentna agencija, ki izvršuje kazni zapora, predvsem osredotočena na ekonomnske obsodbe	yes/ da	Republic of Slovenia, Ministry of Justice/ Republika Slovenija, Ministrstvo za pravosodje	parent organization/ starševska organizacija	varying number of staff members, comprising the: administrative staff, security personnel, kitchen staff, psychologists, social workers, medical cadre/ spremenljivo število članov osebja, vključujoč: administrativno osebje, varnostno osebje, zaposlene v kuhinji, psihologe, socialne delavce, medicinski kader

Table 1: References – RCK [10], Daybreak [11], CSWK [12], DCK [13, 14, 15], KP [16, 17].

At each of the institutions, we orally interviewed from 3 to 10 hand-picked professional workers or volunteers whose work is directly related to the homeless under their jurisdiction and acquired information about: a) the duties and activities of each individual organisation, including its interconnection with other organisations, b) the organisation's methods of integrating the homeless into society, c) the personal thoughts and opinions of its staff regarding the duties they are attending to and d) the staff's personal opinions about how successful the organisation's methods of social reintegration are.

All interviews were semi-structured and conducted orally. The three article authors were the interviewers. At RCK, Daybreak and CSWK, all interviewees belonging to the same organisation were interviewed together, as a group. At DCK, Catholic church officials were interviewed together as one group and the volunteers as a second group due to the interviewees' timetable-related reasons. At KP, the warden, the security guards, the psychologists and the social workers were interviewed together as one group and the nurses together as a second group, because the nurses were attending to their duties during the course of the interview with the rest of the staff. Each group interview lasted from 1 to 1.5 hours, save for the interview with the nurses at KP, which lasted half an hour. All interviews took place during the period between May 2010 and March 2013.

Some technical information (number of employees, financing, etc.) was initially obtained from the organisations' web pages and/or advertising documentation. Later, during the course of the interviews, all data collected in this manner has been orally confirmed.

3 RESULTS

Overall, we interviewed 27 professional workers and volunteers. 3 at RCK (1 activities and finances organiser, 2 volunteers), 7 at Daybreak (3 regularly employed team members, 1 medical doctor volunteer, 3 other volunteers), 3 at CSWK (3 social workers), 4 at DCK (2 Catholic church officials, 2 volunteers) and 10 at KP (1 warden, 3 security guards, 2 nurses, 2 psychologists, 2 social workers).

3.1 Duties and activities

3.1.1 Red Cross Koper

RCK, as the local division of the Red Cross Association of Slovenia, strives to: a) contemplate the everyday life of the local population and actively react to existential needs and powerlessness to actively stand up to both the causes and the consequences leading to them, b) ensure collegiality and respect between numerous members of the utterly heterogeneous community and try to persuade them to see the mutual benefits arising from sharing a part of their own well-being with the people deprived of it, c) stimulate humane solidarity inside the organisation itself and build genuine understanding of the needs of others, d) propagate and reaffirm the social values, concentrating on health and a healthy lifestyle, e) continually introduce the carefully drafted-up education and training programs into the community to elicit an ever-growing response from the local population capable of offering their assistance and f) spread information regarding past accomplishments and future plans of the Red Cross in general and make people acquainted with international humanitarian law.

Every day, numerous volunteers visit the head office of RCK, showing their will to contribute to the ideas and activities of the organisation.

Each day during the winter months, a nearby inn provides freshly-prepared lunch, which could pride itself for being the only warm meal of the day, to large numbers of homeless men and women. Both the food and services are financed by RCK.

Some volunteers also work in the field, thoroughly inspecting the surrounding countryside of Koper, trying to stay ahead in keeping as accurate and as recent an evaluation as possible of the probability of near-future manifestation of the various stages of homelessness and the appearance of socially endangered individuals.

3.1.2 Daybreak Association

The goals of Daybreak are mostly focused on greater social integration of drug abusers. Nonetheless, it is the only organisation that actively offers assistance to homeless addicts, a part of the homeless population normally being eschewed by other humanitarian organisations.

3.1.3 Center for social work Koper

Professionals working at CSWK are in the business of catering for a wide selection of distinct types of individuals: children, youth, the elderly, homeless people, families and others who are subjected to various social, emotional, economic, health-related and similar hardships and in need of proper support.

Activities of the center are based on impartiality towards all members of the society and are aimed at ensuring the basic necessities of decent life for those in need and at lessening of detrimental consequences experienced as a result of social class change. Namely, most measures are primarily directed towards a select group of people the socioeconomic state of whom is doubtlessly soon about to plunge them into an even more dire situation.

The aid-providing programs are carried out by CSWK on three levels: 1) first-hand support to individuals and families in distress, 2) identification of the needs of the socioeconomically handicapped population and 3) voicing the needs of the outcast population in mass media and at the political level.

3.1.4 Diocesan Caritas Koper

DCK's program aimed at helping the homeless is a low-threshold program, primarily focused on people who have already been driven to the edge of existence into visible homelessness. Secondarily, it is meant to assist individuals and families living in concealed homelessness. Tertiarily, volunteers working on the project offer help to those in any kind of material, psychosocial or spiritual distress.

One of the main goals of the project is to constantly adapt to the current predicaments people find themselves in and as such always have the necessary resources at hand to immediately lessen at least some of the burden that comes with them. Hence, the main duties set forth by the project are: a) providing the homeless with lodging, food and basic hygiene facilities, b) giving basic psychosocial and spiritual support to people that have as a result of various circumstances found themselves isolated from the broader community, c) organising activities the focus of which is to provide unemployed or socially isolated individuals a meaningful way to spend their time, d) providing professional aid to those applying for national social benefits and e) spreading general knowledge regarding the issue and occurrence of homelessness as well as enlightening people about the material and social needs of homeless individuals.

The project's activities are carried out at the organisation's day center (Center Caritas Bertoki) and can be separated into three components: a) everyday component, b) hygienic component and c) informative-consultation component.

3.1.5 Koper Prison

KP provides non-voluntary residence to persons in temporary detention and to convicts with a prison sentence up to one year and a half, rarely more. The two groups of individuals are completely segregated. In addition, convicts are separated into three wards based on the nature of their offence and their psychological evaluation. The open ward houses individuals who can be trusted to function in the best interest of the collective and require very little supervision. The semi-open and closed wards on the other hand require a more strict security detail lead by deputy security chiefs.

They are encouraged to participate in voluntary maintenance work, cleaning and even holiday-time decoration, which all present them with certain bonuses.

KP houses a small industrial plant (JGZ Emboplast) that processes plastic masses and manufactures products by injection moulding. Prisoners from the open and semi-open wards are allowed to work at the plant and so earn some much needed credits.

Spiritual life is also not left out. The local catholic priest regularly visits KP and provides religious guidance and unofficial psychotherapeutic aid to all prisoners who require it, not depending on their religious beliefs.

KP also houses a general outpatient sickroom and a dental dispensary. Both are manned by doctors normally employed at the Community Health Center Koper and two nurses permanently working in KP. Thus, inmates are offered the exact same medical services as they would be as regular citizens; moreover, the nurses are also in charge of distributing medication throughout the prison, as per doctors' orders.

3.2 Methods of integrating the homeless into the society

3.2.1 Red Cross Koper

RCK gives out basic food packages such as flour, milk, sugar and macaroni to people on relief. The staple food is usually donated by larger grocery enterprises and by the national food reserves. RCK volunteers also sort out any donated clothes that may appear too worn or otherwise damaged.

Another method aiming to integrate the homeless into society is to slow the on-going progression from concealed to visible homelessness. This is accomplished by RCK volunteers who anonymously pay the bills of families living in substandard socioeconomic conditions, either regularly or on demand. The anonymity of the families that are afforded this form of assistance itself on the other hand also contributes to alleviation from otherwise certain stigmatisation, further potentiating the method's beneficial influence on social integration.

RCK officials are trying hard to successfully convince the Koper municipality to start organising a local safe house for "shelterless" families. It would serve as an effective sanctuary for families thrown out of their homes and onto the streets.

3.2.2 Daybreak Association

Two main programs aimed at successful social integration of current and former drug abusers are being carried out by the Association: the low-threshold and the high-threshold rehabilitation program.

Any addict in need of assistance (mostly homeless individuals) can enter the low-threshold program, for which a specialised center provide its users with a sort of shelter, elementary lodging where they are able to eat up, wash, clean their clothes, change their babies' diapers or simply sit down for a while without submitting to the pain-inciting distractions of the biased outside world.

In order to be admitted into the high-threshold program, the candidate is required to be physiologically free of addiction to any substance, including methadone. Those who meet this criterion are conceded entry into one of the therapeutic communes based on the professional evaluation of the individual in question. In spite of the fact that therapeutic communes focus on drug addicts in general, proper lodging represents a more than welcome luxury for those among them who live on the streets.

3.2.3 Center for social work Koper

By coordinating efforts with several other philanthropic organisations (RCK, Caritas, healthcare institutions, safe houses, communes) and organising their cooperative ventures, CSWK aims to inform local people in need of their basic right to social support. They acquaint them with the existing charitable organisations and urge them to make good use of the upkeep possibilities that those institutions present.

CSWK's programs dealing with homeless people involve collaboration with RCK to provide those people with food and shelter. With mutual efforts, both organisations are striving to persuade the Koper municipality to invest in the construction of a crisis center that would be dedicated to providing immediate help to the homeless at times of food shortage and/or climatic extremes. If needed, it would also be used as a medical care facility for individuals lacking any kind of health insurance.

3.2.4 Diocesan Caritas Koper

Social reintegration of the homeless is mostly accomplished by DCK's higher-threshold programs. Every individual included in one of these programs is encouraged to socialise, helped to find a job and constantly motivated into becoming self-sustaining and responsible for the course of their life, effectively transforming their homeless lifestyle into a more society-acceptable one.

Within availability of non-paid rooms or apartments (provided by various volunteers) or the scope of financial resources at DCK's disposal that can be used to pay rent, as many homeless individuals enrolled into one of these programs as possible are provided a temporary place of residence.

During the time enrolled, the homeless work with the help of DCK volunteers on seeking a permanent place of residence, obtaining one being one of the principal steps toward a successful social reintegration. Should they have become indebted during or before homelessness befell them, volunteers help them organise a way to pay off that debt by non-financial means, mostly through public works.

3.2.5 Koper Prison

KP staff does not directly work on integrating homeless convicts back into the society when they have served their term. Instead, the entire cadre concentrates on trying to bestow upon them a stable groundwork on which they may begin anew.

A convenient way of ensuring at least a partially stable future for these homeless people is the aforementioned industrial plant that allows inmates to procure wages. In comparison to their fellow inmates, homeless convicts are even more decidedly suggested to continually keep saving until the day of their release.

Another option presented to them, aimed at overcoming the uncertainties of returning to the street without any stashed possessions, is to request sanctuary in a commune for the homeless; an option the desired end result of which is hardly ever reached in spite of KP staff's efforts to reserve each of the candidates a free space, since such communes are not particularly

in abundance and, moreover, are usually severely overcrowded.

Another technique used to facilitate active reintegration, not limited to homeless inmates only, is the provision of education. In their free time, numerous prisoners regularly study and a great many of them earn a degree in at least one profession of their choosing.

3.3 Personal thoughts and opinions of staff

3.3.1 Red Cross Koper

According to the volunteers at RCK, the issue of homelessness exhibits constant expansion throughout the local community and a growing entanglement with other, generally considered more important nationwide problems such as the economic crisis. Today, a small number of the homeless can take refuge in the barracks right beside the General Hospital Isola. Construction of the barracks was financed by RCK, which also provides funds for its maintenance. This rather sorrowful option is short-lived nonetheless, because hospital officials aim towards making good use of the land on which the barracks is located in the near future.

RCK staff emphasises that they do not procure enough monetary resources to successfully bestow them upon the entire endangered population. When supplies do arrive, they quickly run out. On the other hand, the storage space at their disposal is inappropriate for adequate food preservation when it arrives from donators.

3.3.2 Daybreak Association

The Daybreakers stated that one of the principal impediments resulting in poorer success rates is the problem of stigmatisation - the general normal population perceives drug addicts, including homeless ones, as lower beings unable to cope with the roughness of everyday life, with a strong belief that such a fate could never have befallen themselves. As such, this is the cardinal reason why Daybreak's efforts are frequently condemned to futileness and its employees are in essence forced to helplessly keep company the terminally disfigured and devastated addicts as their lives slowly decay.

For the very same reasons, concealment of parental identity of children born to addicted (and homeless) individuals from the general public is of outmost importance.

Thus, both regular employees and volunteers working for Daybreak are convinced that only strong-minded individuals should offer help to drug addicts and their families. A person working with stigmatised people is supposed to be able to endure the harsh reality of helplessness frequently bestowed upon him/her and at the same time have a firm belief that drug addicts are simply people who have had their share of bad

luck handed to them on an enormous platter. As far as homeless addicts are concerned, even more so.

An obstacle is also the lack of workspace. Services of both low- and high-threshold programs therefore take place in the same quarters, sometimes even simultaneously.

Homeless addicts represent an even greater challenge, since Daybreak does not possess the required facilities needed to provide any kind of permanent housing solution. In addition, governing parties are reluctant to provide Daybreak with such infrastructure due to the fact that the majority of homeless addicts are not homeless on a permanent basis; rather, they have either been thrown onto the street by their families or they cannot afford to pay rent regularly.

Lastly, Daybreak's employees put emphasis on teamwork and interconnection with other organisations as them being a kind of a stepping stone crucial for Daybreak's activities.

3.3.3 Center for social work Koper

Families or individuals who earn less than the administratively defined threshold value per month per person living in the household by definition live in a state of complete poverty and are as such entitled to receiving monetary socioeconomic support.

However, social workers working at CSWK emphasised that people who exceed the aforementioned threshold value even slightly are on the other hand not subject to receiving such supplements and are consequently forced to dwell in even poorer conditions than their fellow indigent brethren who the circumstances have shown mercy to, thus hindering social reintegration. Evidently, those just above the line are continually seeking diverse ways and sprouting ingenious methods of lowering their income to a value below the cutoff point and so becoming entitled to obtaining the monthly bonus.

3.3.4 Diocesan Caritas Koper

DCK statistics shows that in years 2011 and 2012, the number of people that sought any kind of assistance increased by approximately 15% in comparison with the previous year. DCK volunteers stressed that people in socioeconomic distress more often than nutrition require a safe place to come to where they can let go of the struggle against the pressures of everyday world and relax, talk about their problems with other people and find out that they are not the only ones who are isolated and suffering as victims of socioeconomic distress.

DCK's Catholic Church officials told us that they are satisfied with the organisation's impact on the homeless population in the area as well as its methods. They told us that in the year 2012, a total of 36 individuals decided to enrol in a high-threshold program.

3.3.5 Koper Prison

It is the guards' opinion that a certain measure of strictness is required in order to keep the inmates at bay and at a safe psychological distance. At the same time, guards genuinely enjoy group sport activities and chess tourneys in which both inmates and the security detail can participate.

On the other hand, the two nurses were considerably less willing to comment on their feelings towards the overall atmosphere in the correctional facility. The sole thought was that their work is abundant in the variety of tasks they are required to complete each day.

The social workers employed at KP stressed that homeless convicts represent a unique constituent of the prison's population, because after they have served out their punishment, they simply have no place to go to and are so subtly coerced into returning to their abysmal former everyday life under open sky.

Therefore, most are unusually glad to be living in the correctional facility where they are afforded comfortable lodgings and warm meals. Consequently, a fair number of those who are released intentionally commit another criminal act that warrants imprisonment in order to ensure themselves a stable home for an additional few months. Therefore, the success of their social reintegration largely depends on their degree of homelessness.

4 DISCUSSION

In our study, we presented the work of five organisations acting in the city of Koper and its surroundings, each of which at least partly concentrates on offering support to the homeless.

Due to the fact that these five organisations represent the entire local workforce engaged in trying to solve or at least abate the matter of homelessness, all the relevant information that therefore could be collected regarding professional work in this field originated from these five institutions.

Having composed the three basic questions while keeping in mind that they should be of an open type, not overly structured, we allowed the employees of our target institutions to experience greater freedom while conveying fundamental information. The open form of our conversations, however, has not allowed us to perform a statistical analysis of the amassed data.

At the same time, an interview was chosen as the research method of choice because an oral examination technique allowed us to promptly raise additional, more detailed inquiries about our interviewees' thoughts regarding the nature of their work and supplementary questions to entice more hidden opinions concerning the difficulties they are required to handle.

In our study, we questioned a great number of professionals and volunteers, which provided us with a holistic insight into the lives of those having in common the desire to assist people in need.

On the other hand, we received no recurrent information from any of the individuals being offered supportive services. Therefore, additional research would be needed to fully accredit the efficiency of the chosen organisations' humanitarian programs from the viewpoint of their target population.

We presented the results of our study in a descriptive form, individually for each of the two base interview questions (duties and activities, methods of integration).

Duties and activities of both governmental (GOs) and non-governmental organisations (NGOs) are necessary for providing effective assistance to people in need. Each one of those endeavours and courses of action is clearly defined by each organisation independently [10–12, 16–21]. NGOs excel at quickly responding to immediate needs. Their programs are usually implemented only as short-term resolutions. GOs on the other hand require a longer time to implement their concepts, nonetheless they provide long-term stability.

The reasons for the observed differences lies in the fact that the material resources at the disposal of NGOs as well as their possibilities of organising active preventative and supportive measures are limited mostly to voluntary donations. Such donations are normally hardly abundant enough to guarantee the lasting well-being of the endangered population.

On the other hand, the difficulty hindering GOs in their attempts at giving instantaneous assistance is the fact that their methods are required to conform to specific national and international laws and regulations regarding humanitarian aid. Consequently, GOs mostly cannot respond to immediate needs as quickly as would optimally be needed due to bureaucratic deterrence, in spite of their continuing efforts to overcome that obstacle.

The only exception to the origin of financing is the NGO Daybreak, the bankroll of which is held up entirely from non-voluntary sources (Ministry of health, Koper municipality). That budget is in turn used by the Association itself to obtain the needed resources, effectively circumventing the need to rely on voluntary contributions or even leftover material from healthcare institutions.

In our study, we noticed several similarities between, on one hand the integrational methods being utilised for aiding the homeless and on the other hand those aimed at supporting homeless prisoners' longings to reinstate themselves into their former place in society.

The offered support vitally assists and is beyond any doubt an imperative necessity that aids the homeless in ultimately escaping the never-ending circle into which

they have been driven by reasons infinitely diversified. In contrast, at a first glance, prisoners significantly differ from the homeless in that within the confines of the correctional facility, inmates do not endlessly wander a vicious circle. Instead, they are simply coerced into an existence deprived of physical freedom. After a predefined time period, they are able to leave their encaged life without any likelihood of reintertwining themselves with criminal dealings.

While the above does hold water in regards to convicts not budgetarily endangered, it unquestionably does not bear any relevance as far as homeless inmates and those originating from an abysmal socioeconomic milieu are concerned. With the latter, the likelihood of reinstating themselves into the life of an outlaw is extremely high, the principal reason for this being the society itself. In its reluctance to offer them an honest occupation, the reasons being their low education, inadequate number of available workspaces and stigmatisation due to their criminal history (in spite of confidentiality precautions), the broader community facilitates the continuation of these individuals' established pattern of lawless behaviour.

Therefore, convicts from existentially imperilled social classes need to utilise enormous mental discipline to prevent the recurrence of their former habits upon release. Thus, these individuals' own initiative to work in the previously noted industrial plant and to study, providing them with a minimal monetary and educational stepping stone, represents an enormous leap towards successful legitimate social reintegration.

Even though people from remote parts of the society usually cooperate, the efforts of those who work with them are nothing short of exerting. They strive to achieve a general social acceptance of their ward population, which is the one thing those people need the most. Only the society truly is capable of offering them a firm stepping stone towards escaping from the vicious circle in which they stray.

Although not in scope of this study, in order to prepare sound methodological foundations for later evaluation of the effectiveness of the measures that the herein presented organisations utilise, it would be of great importance to continue similar research from the homeless people's point of view - gather their views and opinion on the effectiveness of the humanitarian efforts in question.

5 CONCLUSIONS

Both GOs and NGOs are necessary for providing effective assistance to people in need. NGOs excel at quickly responding to immediate needs. Their programs are usually implemented only as short-term resolutions. GOs on the other hand require a longer time to implement their concepts. Nonetheless in contrast to NGO projects, they provide long-term stability. Even though people from remote parts of the society usually cooperate, the efforts of those who work with them are nothing short of exerting. They strive to achieve a general social acceptance of their ward population, which is the one thing those people need the most. Only the society truly is capable of offering them a firm stepping stone towards escaping from the vicious circle in which they stray.

Acknowledgments

References

1. Dekleva B, Razpotnik Š. Problematika brezdomstva v Ljubljani: končno poročilo raziskovalne naloge. Združenje za socialno pedagogiko, 2006.
2. Štern P, editor. Slovar Slovenskega knjižnega jezika. Državna založba Slovenije, 2000.
3. Springer S. Homelessness: a proposal for a global definition and classification. Habitat Int 2000; 24: 475–84.
4. Dekleva B, Filipovič Hrast M, Nagode M, Razpotnik Š, Smolej S. Ocena obsega odkritega in skritega brezdomstva v Sloveniji: zaključno poročilo študije. Inštitut RS za socialno varstvo, Fakulteta za družbene vede UL, Pedagoška fakulteta UL, 2010.
5. Edgar B. European Review of statistics on homelessness. European Housing Research, European Federation of National Organisations Working with the Homeless, 2009.
6. Krek M, Belin J. Ko si na dnu. Zavod za zdravstveno varstvo Koper, 2010.
7. Dekleva B, Razpotnik Š, editors. Konferenca o socialni izključenosti, revščini in brezdomstvu: razvoj predloga nacionalne strategije na področju brezdomstva. Ljubljana: Pedagoška fakulteta, Društvo za pomoč in samopomoč brezdomcev Kralji ulice, 2010.

8. Marsič B. Revščina se najbolj občuti v Izoli. Available Mar 7, 2013 at: http://www.regionalobala.si/novica/revscina-se-najbolj-obcuti-v-izoli-

9. Hancock B, Windridge K, Ockleford E. An introduction to qualitative research. The NIHR RDS EM / YH, 2007.

10. Rdeči Križ Koper. O nas. Available Oct 29, 2011 at: http://www.rdecikrizkoper.si

11. Društvo Svit Koper. Društvo SVIT. Available Mar 30, 2010 at: http://www.svit-kp.org

12. Center za socialno delo Koper. Available Nov 3, 2011 at: http://csd-kp.si/

13. Caritas Internationalis. Available May 19, 2013 at: http://www.caritas.org/index.html

14. Caritas Deutschland. Finances. Available Jun 5, 2013 at: http://www.caritas-germany.org/54634.html

15. Škofijska Karitas Koper. Available May 19, 2013 at: http://karitas-kp.rkc.si/

16. Zavod za prestajanje kazni zapora Koper. Uradna internetna stran Zavoda za prestajanje kazni zapora Koper. Available Mar 30, 2010 at: http://www.mp.gov.si/si/organi_v_sestavi/zavodi_za_prestajanje_kazni_zapora_in_prevzgojni_dom/zpkz_koper

17. Valentinčič D, editor. Zavod za prestajanje kazni zapora Koper. Uprava Republike Slovenije za izvrševanje kazenskih sankcij, 2004.

18. T T. Iščejo novo zavetišče za brezdomce na Obali. Dnevnik.si. Available Mar 6, 2013 at: http://www.dnevnik.si/clanek/293109

19. Comunità Lautari. Lautari Comunità Terapeutica. Available Nov 6, 2011 at: http://www.lautari.it/

20. Rdeči Križ Slovenije. Poslanstvo. Available Mar 30, 2010 at: http://www.rks.si/sl/Poslanstvo/

21. International Federation of Red Cross and Red Crescent Societies. Principles and values. Available Mar 30, 2010 at: http://www.ifrc.org/en/what-we-do/principles-and-values/

ESTIMATION OF SODIUM AVAILABILITY IN FOOD IN SLOVENIA: RESULTS FROM HOUSEHOLD FOOD PURCHASE DATA FROM 2000 TO 2009

OCENA RAZPOLOŽLJIVOSTI NATRIJA V ŽIVILIH V SLOVENIJI: REZULTATI IZ RAZISKAVE O PORABI ŽIVIL V GOSPODINJSTVIH OD LETA 2000 DO LETA 2009

Cirila Hlastan Ribič[1,4], Jožica Maučec Zakotnik[1], Barbara Koroušić Seljak[2], Rok Poličnik[1], Urška Blaznik[1], Nataša Fidler Mis[3], Ivan Eržen[1], Chen Ji[5], Francesco P. Cappucio[5]

Abstract

Introduction: The main aim of the study was to estimate average daily sodium availability of Slovenian consumers based on the food purchase data for the period 2000-2009. The secondary aim was to look for food group contributors to sodium availability.

Methods: Food purchase records (Household Budget Survey) as well as country-specific reference values and food composition information were used to estimate mean sodium availability of purchased foods (grams of sodium/person/day - g Na/p/day) as well as food groups and foods with the largest contribution to the total sodium availability.

Discussion and results: The mean sodium availability of purchased foods decreased in the period 2000-2009 and was on average 2,104±132 mg Na/p/day, not accounting for ready-made meals, most semi-prepared foods and adding salt during cooking and at the table. The key food group contributors of sodium in Slovenia were breads and bakery products (35.0%), meat products (27.9%), processed vegetables (6.6%) and cheeses (5.3%).

Conclusions: Notwithstanding the smaller purchased quantities of higher-sodium foods (e.g. sausages, prosciutto, dry meat, pickled cucumbers) in comparison to larger purchased quantities of the medium-sodium foods (e.g. white bread, mixed bread, brown bread, milk, rolls), both food groups contribute significant amounts of sodium in the diets of Slovenians.

Key words: household budget survey, sodium availability, sodium content, food groups

Izvleček

Uvod: Glavni namen raziskave je bil ugotoviti razpoložljivost natrija v kupljenih živilih v Sloveniji. Osnovo so predstavljali podatki nacionalne raziskave o porabi v gospodinjstvih za obdobje 2000–2009. Sekundarni cilj raziskave je bil ugotoviti, katere skupine živil prispevajo k največji razpoložljivosti natrija v prehrani slovenskih porabnikov.

Metode: Za oceno povprečnega vnosa natrija (izraženega v gramih natrijevega klorida/oseba/dan – g osebo/Na/dan) v kupljenih živilih in glavnih skupinah živil so bili uporabljeni podatki o povprečni porabi živil v gospodinjstvih in podatki o hranilni sestavi živil.

Razprava in rezultati: Povprečna vrednost razpoložljivega natrija v kupljenih živilih se je v obdobju od leta 2000 do leta 2009 znižala in znaša v povprečju 2,104±132 mg natrija/osebo/dan. Pri tem niso bile upoštevane vrednosti vnosa pripravljenih in polpripravljenih obrokov ter dosoljevanje hrane pri mizi. Ugotovljeno je bilo, da so ključne skupine živil, ki prispevajo največje količine natrija v prehrani prebivalcev Slovenije, kruh in pekovski izdelki (35,0%), mesni izdelki (27,9%), konzervirana zelenjava (6,6%) in siri (5,3%).

Zaključki: Raziskava je pokazala, da k vnosu natrija v prehrani prebivalcev Slovenije znatno prispevajo živila, ki vsebujejo višje vrednosti natrija (npr. salame, pršut, sušeno meso, vložena zelenjava) in ki se jih v prehrani ljudi zaužije v nižjih količinah, in živila s srednjimi vrednostmi natrija (npr. bele in mešane vrste kruha, črni kruh), ki se jih porabi v večjih količinah.

Ključne besede: anketa o porabi v gospodinjstvih, razpoložljivost natrija, vsebnost natrija, skupine živil

[1] National Institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia
[2] Jozef Stefan Institute, Computer Systems Department, Jamova 39, 1000 Ljubljana, Slovenia
[3] University Medical Centre Ljubljana, Division of Peadiatrics, Department of Gastroenterology, Nephrology and Nutrition, Bohoričeva 20, 1000 Ljubljana, Slovenia
[4] University of Ljubljana, Medical Faculty, Department of Public Health, Zaloška 4, 1000 Ljubljana, Slovenia
[5] WHO Collaborating Centre for Nutrition, University of Warwick, Coventry, United Kingdom
Correspondence to: e-mail: cirila.hlastan-ribic@nijz.si

1 INTRODUCTION

Sodium is a mineral nutrient essential for life in small quantities. For many years, concerns have been expressed that consumption levels of sodium are well above those needed for nutritional purposes, and that these are having an adverse effect on health, in particular increased high blood pressure leading to higher risk of cardiovascular diseases (1–2). Studies also indicate significant associations between high sodium intake and a variety of chronic conditions including type II diabetes (3), cataract (4), gastric cancer (5), kidney disease (6, 7) and osteoporosis (6, 8). A high salt intake may also be an important contributing factor in the development of obesity (9). The prevalence of hypertension (blood pressure above 140/90 mmHg) in the Slovenian adult population (age 25 to 64 years) is high (39.6%) (10), making a reduction in salt intake a national priority for the prevention of cardiovascular disease.

WHO recommends a reduction in sodium intake to reduce blood pressure and risk of cardiovascular disease, stroke and coronary heart disease in adults. WHO recommends a reduction to <2 g/day sodium (5 g/day salt) in adults (11). In 2005, Slovenia adopted the recommendation for nutrients intake from Germany, Switzerland and Austria named The Reference Values for Nutrients Intake (D-A-CH). The Reference Values for Nutrient Intake create the basis on which diets are planned to match nutritional requirements with food intake. The minimum recommended value for daily sodium intake for adults in-line with D-A-CH recommendations amounts to 550 mg/day of sodium (1.4 g/day salt) (12). In developed countries, ingestion of sodium tends to exceed the recommended intake (13), with the largest proportion originating from processed foods: for example, in the United Kingdom and the USA, it has been estimated that 75% of sodium intake comes from processed or restaurant foods, 10–12% is naturally occurring in foods and the remaining 10–15% is from the discretionary use of salt in home-cooking or at the table (14). In the British Diet and Nutrition Survey, a number of key food groups were found to be the major contributors to total daily sodium intake from food among British adults. These included cereals and cereal products providing 35%, meat and meat products contributing 26% and milk and milk products 8% of sodium from food (15). In Slovenia, the average salt intake of the population, assessed by 24h urinary sodium excretion, is 11.3±4.9 g salt/d, significantly higher in men than in women (13.0±5.1 vs. 9.9±4.3 g salt/day respectively) (16).

The total salt intake of 2,581 Slovenian adolescents (aged 14 to 17 years) was 10.4±0.2 g salt/d, much higher than the upper WHO limit for adults. Moreover, boys ate more salt than girls (11.5±0.3 vs. 9.4±0.2 g salt/d P < 0.001). The main food sources of salt for adolescents were table salt (33%), bread (24%), salty snack products (10%) and meat products (8%) (17, 18). However, there is little information on exposure to sodium-rich foods in the general population of Slovenia (19-21).

There are various methods to estimate sodium intake in a population. While measurement of urinary sodium excretion is the most accurate method (22), other methods, i.e. different food consumption surveys (questionnaires or interviews), tend to underestimate sodium intake by approximately 16–22% (17, 18). Information about nutrient availability within a country can be collected using three different means: food balance sheets, household budget surveys (HBSs) and specifically designed individual food consumption surveys. Both food balance sheets and HBSs provide insight into food availability but do not assess food consumption at an individual level. Food consumption data collected in nutrition surveys could be used for estimating sodium intake where accurate data on the sodium content of local foods were available (23).

The objective of the present study was to estimate average daily sodium availability in purchased foods per Slovenian consumer based on the food purchase data from the HBSs for the period 2000-2009. The secondary aim was to establish a comprehensive food composition database to monitor the sodium content of foods in Slovenia.

2 METHODS

2.1 The Household Budget Survey sampling design

The sample frame is the Central Population register (CRP). The sample stratification was made with regard to 12 statistical regions and six types of settlements. The survey was harmonised with Eurostat's recommendations. By combining data of three consecutive years, more accurate estimates are obtained. Data from three years are calculated to the middle year, which is used as the reference year for the interpretation of published results. The survey is implemented on the basis of the Slovenian National Statistics Act (24) and the Annual Programme of Statistical Surveys.

The consumption of goods is collected by diaries that are kept by all household members for two consecutive weeks. HBS data used for calculations in the present survey contains 223 foods purchased in stores, food markets or produced at own garden/farm by an average 3,727 households a year. Average sample in the HBS consisted of 11–12% children (<11 years), 8–9% adolescents (11–18 years) and 78–80% adults (>18 years) from 12 Slovenian geographical regions.

The Slovenian representative sample of households was equally distributed throughout the year. A more detailed description of the HBS sampling design is available elsewhere (25). In the study, we used data from nine HBSs from the period 2000-2009.

2.2 Estimation of dietary sodium and salt availability

HBS foods were classified according to the international COICOP classification into seven food groups, 19 food categories and 242 food subcategories. Purchasing data and sodium values were provided for all food products within the following categories: grains and grain-based products, fresh and processed vegetables and fruits, starchy roots and tubers, legumes, nuts and seeds, dairy products, eggs and egg products, fresh and processed meats, poultry and fish, food for infants and small children, sugar and confectionary, snack food, edible oils, sauces and spreads, beverages and drinks. Based on the data on annual purchases in kilograms per person, provided by HBSs (25) and the sodium content of foods, we carried out the calculations to estimate the average sodium availability of purchased foods (SAPF) in Slovenian households for the period 2000–2009.

There were three sources from which we obtained information about food composition:

1. sodium content of purchased foods were derived from food product labels;
2. for fresh foods and unlabelled products, we applied generic data from national and European food composition tables, and
3. sodium content of purchased meat products and bread and bakery products were analysed at the National Institute of Public Health, in a laboratory accredited according to ISO 17025. Sodium content was calculated from the present and quantified salt in the products (26).

Data obtained from the second and last source were screened by the authors (CRH) for plausibility. The results were expressed in milligrams of sodium per person daily. Comparisons on distribution of the largest contributors to the total SAPF were carried out. For the conversion from sodium (Na) to salt (sodium chloride (NaCl)), a factor of 2.54 was used, NaCl (mg) = Na (mg) x 2.54.

2.3 Statistical analysis

Statistical analyses were performed using SPSS for Windows (16.0). Descriptive statistics were calculated for continuous variables and expressed as mean, standard error of mean and standard deviation.

3 RESULTS

3.1 Sodium availability from purchased foods in Slovene households for the period 2000–2009

Based on the HBS data, sodium contained in salt added at cooking/preparing meals and at the table, salt from ready-made meals and most semi-prepared foods were excluded from this survey.

Table 1 represents estimated household SAPF and salt availability (SA) based on household food purchases in Slovenia for the period 2000-2009. Sodium availability of purchased foods (SAPF) in Slovenian households decreased from 2,289 mg/p/day (year 2000) to 1,860 mg/p/day (year 2009). Thus, the average SAPF for the period 2000-2009 was 2,104±132 mg/p/day.

Table 1. Household SAPF and SA based on food purchases in Slovenian households for the period 2000–2009.
Tabela 1. Razpoložljivost natrija in soli v kupljenih živilih v Sloveniji, v obdobju od 2000 do 2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2009	Mean/ Povprečje
Sodium/Natrij (mg/person/day)/ (mg/osebo/dan)	2,289	2,254	2,168	2,127	2,103	2,103	2,042	1,988	1,860	**2,104**
Salt*/Sol* (mg/person/day)/ (mg/osebo/dan)	5,814	5,725	5,508	5,405	5,343	5,340	5,186	5,049	4,723	**5,343**

* 1 mmol of sodium (Na) corresponds to 23.0 mg; NaCl (mg) = Na (mg) x 2.54/ 1 mmol Natrija (Na) ustreza 23.0 mg; NaCl (mg) = Na (mg) x 2.54

3.2 Sodium and salt availability by food groups

In Table 2, a distribution (mg sodium/person/day and % to total daily SAPF) of household SA between food groups with the largest contribution to SAPF is presented. The key food groups contributing to dietary sodium intake were breads and bakery products (761 mg Na/p/day; 35.0% of SAPF) and meat products (597 mg Na/p/day; 27.9% of SAPF), while processed vegetables (136 mg Na/p/day; 6.6%) and cheeses (110 mg Na/p/day; 5.3%) also contributed to the household SAPF.

Table 2. *Food groups with largest[a] contribution to total daily SAPF in Slovenian households for the period 2000–2009.*

Tabela 2. *Skupine živil, ki prispevajo največje[a] količine natrija v gospodinjstvih v Sloveniji, v obdobju od 2000 do 2009.*

Year/Leto	SAPF (mg Na/p[b]/day) (mg Na/p[b]/dan)	Contribution to SAPF/Količina natrija v kupljeni hrani	Bread and bakery products/ Kruh in pekovsko pecivo	Meat products[c]/ Mesni izdelki[c]	Processed vegetables[d]/ Konzervirana zelenjava[d]	Cheeses/ Siri
2000	2,289	**mg Na/p/day/ mg Na/o/dan**	947	599	115	97
		%	41.14	26.19	4.89	4.14
2001	2,254	**mg Na/p/day/ mg Na/o/dan**	883	622	115	103
		%	39.16	27.59	5.01	4.47
2002	2,168	**mg Na/p/day/ mg Na/o/dan**	826	594	119	103
		%	38.10	27.40	5.41	4.67
2003	2,127	**mg Na/p/day/ mg Na/o/dan**	763	608	126	110
		%	35.87	28.57	5.86	5.12
2004	2,103	**mg Na/p/day/ mg Na/o/dan**	728	593	135	114
		%	34.59	28.20	6.33	5.36
2005	2,103	**mg Na/p/day/ mg Na/o/dan**	673	618	153	120
		%	32.02	29.41	7.21	5.64
2006	2,042	**mg Na/p/day/ mg Na/o/dan**	624	611	162	116
		%	30.59	29.94	7.85	5.63
2007	1,988	**mg Na/p/day/ mg Na/o/dan**	648	532	162	114
		%	32.59	26.75	8.13	5.72
2009	1,860	**mg Na/p/day/ mg Na/o/dan**	570	496	155	123
		%	30.65	26.69	8.33	6.63
Mean/ Povprečje	**2,104**	**mg Na/p/day/ mg Na/o/dan**	**761**	**597**	**136**	**110**
		%	**34.97**	**27.86**	**6.63**	**5.32**

Estimated average salt availability/ Povprečna ocenjena razpoložljivost soli	5,343*	mg NaCl/p/dan/ mg Na/o/dan	1,933	1,517	345	278

[a] Only food subcategories with the largest contribution to sodium availability are mentioned in the table; the remaining food categories are: pastry, other grain foods, milk and milk products (not cheeses), fresh vegetables, fresh and processed fruit, nuts, sweets, eggs, fresh meat, fresh fish and fish products, etc./ V tabeli so navedene podskupine živil, ki prispevajo k največji razpoložljivosti natrija; ostale kategorije živil so: peciva, ostali žitni izdelki, mleko in mlečni izdelki (razen siri), sveža zelenjava, sveže in konzervirano sadje, oreški, sladka živila, jajca, sveže meso, sveže ribe in ribji izdelki itd.

[b] p = person/o = oseba

[c] Included meat products: bacon, ham, cooked sausages and other sausage meat products, frankfurters (hot-dog)./ Vključeni mesni izdelki: svinjina, šunka, salame in ostali mesni izdelki, hrenovke (hot-dog).

[d] Included processed vegetables: sauerkraut, pickled turnip, canned vegetables (red pepper, mushrooms, olives, "ajvar" (salt based relish made from red pepper, eggplant and garlic), horseradish, corn), prepared potato products (frozen french-fries)/ Vključena konzervirana zelenjava: kislo zelje, kisla repa, konzervirana zelenjava (rdeča paprika, gobe, olive, »ajvar« (zelenjavni izdelek iz rdeče paprike, jajčevcev in česna), hren, koruza), predpripravljeni krompirjevi izdelki (zamrznjen pommes frittes)

[*] 1 mmol of sodium (Na) corresponds to 23.0 mg; NaCl (mg) = Na (mg) x 2.54/ 1 mmol of sodium (Na) ustreza 23.0 mg; NaCl (mg) = Na (mg) x 2.54

In addition, in the examined period the SA in bread and bakery products decreased and the SA in processed vegetables and cheeses increased slightly (Figure 1).
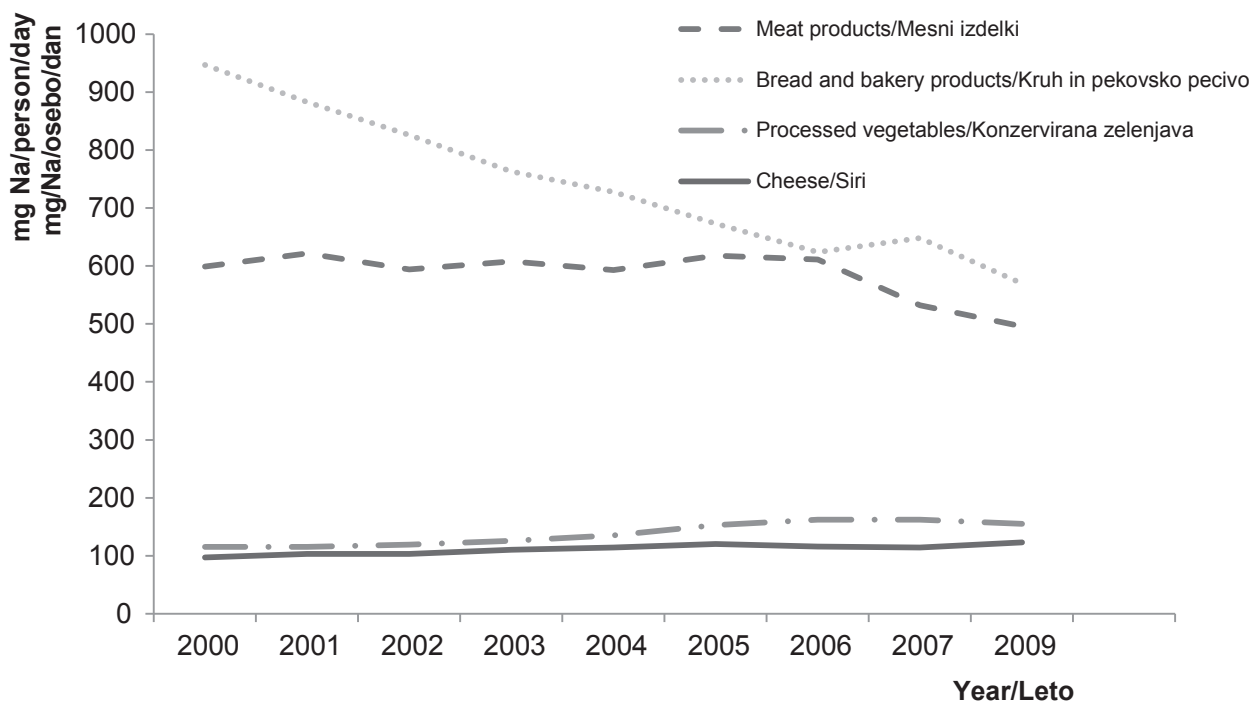

Figure 1. Average annual values in the period 2000-2009 for the SA of food groups with the largest contribution to total SAPF daily in Slovenian households.

Slika 1.   Povprečne letne vrednosti natrija v živilih z največjo razpoložljivostjo natrija v gospodinjstvih v Sloveniji, v obdobju od 2000 do 2009.

3.3 Sodium and salt availability of foods according to their sodium content and purchased quantity

In Table 3 and 4, only foods with the highest contribution to total daily SAPF with confidence intervals are presented. To interpret their high contribution to total SAPF, these foods can be divided into three groups according to the other foods included: 1) foods with high sodium content and high purchased quantity, 2) foods with high sodium content and relatively low purchased quantity and 3) foods with relatively low sodium content and high purchased quantity. Based on this classification, various salamis and cheeses were included in the first group. In the second group with high sodium content, bacon, dry meat, prosciutto and various sausages were included. In the third group with high purchased quantity, foods like cow's milk, brown bread, mixed bread and white bread were included.

Table 3. Average SA of foods with the largest contribution to total SAPF in Slovenian households for the period 2000–2009.
Tabela 3. Povprečne vrednosti razpoložljivosti soli v skupinah živil, ki prispevajo največ k skupni razpoložljivosti natrija v gospodinjstvih v Sloveniji v obdobju od 2000 do 2009.

Food group/Skupine živil	Foods/Živila	Average sodium concentration (mg/100 g)*/Povprečna koncentracije natrija (mg/100 g)/	FSA 2012 target (mg/100 g)**/ FSA 2012 cilji (mg/100 g)**	Purchased quantities of foods (mg/pa/day)/ Količina kupljenih živil (mg/o/dan)	Average sodium availability in purchased quantities (mg Na/p/day)/Povprečna razpoložljivost natrija v kupljenih živilih (mg Na/o/dan)	Contribution to SAPF (%)/Prispevek k razpoložljivosti natrija v kupljeni hrani (v %)	Estimated salt availability (mg NaCl/p/day)/ Ocenjena razpoložljivost soli (mg NaCl/o/dan)
3	White bread/Bel krih	565	370	42,310	239	11.1	607
1	Various salamis/različne salame	839	700	14,368	200	9.3	508
1	Cheeses/Siri	694	215-750	15,790	110	5.1	279
3	Brown Bread/Črn kruh	455	370	19,490	89	4.1	225
2	Dry meat/Sušene mesnine	1800	1150	4,550	80	3.7	203
3	Mixed bread (white and brown)/Mešane vrste kruha (beli in črni)	506	370	15,100	76	3.5	194
2	Prosciutto/Pršut	2445	1150	2,430	60	2.8	152
3	Cows milk (sterilized)/ Kravje mleko (sterilizirano)	48	-	97,600	47	2.2	119
2	Various sausages/ Različne klobase	837	450	5,030	40	1.9	102
3	Rolls/Pekovski izdelki	531	370	8,120	40	1.9	102
	Frankfurters (hot-dog)/ Hrenovke	699	450	6,130	40	1.9	102

2	Bacon/Slanina	1770	1150	2,260	40	1.9	102
3	Breakfast cereals/Žita za zajtrk	460	300	6,130	30	1.4	76
	Pickled cucumbers/Kisle kumarice	960	200	2,840	30	1.4	76

* Sodium content is obtained from various food composition databases (Souci et al., 2005; Golob et al., 2006; Kaić-Rak & Antonić, 1990; Kulier, 1996; United States Department of Agriculture; Results at National Institute of Public Health)./ Podatki o vsebnosti natrija so pridobljeni iz različnih tabel hranilnih vrednosti živil (Souci et al., 2005; Golob et al., 2006; Kaić-Rak & Antonić, 1990; Kulier, 1996; United States Department of Agriculture; Rezultati Nacionalnega inštituta za javno zdravje).

[a] p = person/o = oseba

** http://www.food.gov.uk/news/pressreleases/2009/may/salttargets (Assessed in November 2011)./ http://www.food.gov.uk/news/pressreleases/2009/may/salttargets (Dosegljivo: November 2011).

Table 4.   The confidence intervals for Bread and bakery product, Meat products, Processed vegetables and Cheeses over the time period of 2000-2009.

Tabela 4. Interval zaupanja za kruh in pekovske izdelke, mesne izdelke, konzervirano zelenjavo in sire v obdobju od 2000 do 2009.

| Year/ Leto | Bread and bakery products/Kruh in pekovski izdelki | 95% Confidence Interval of the Difference/ 95 % interval zaupanja | | Meat products/ Mesni izdelki | 95% Confidence Interval of the Difference/ 95 % interval zaupanja | | Processed vegetables/ Konzervirana zelenjava | 95% Confidence Interval of the Difference/ 95 % interval zaupanja | | Cheeses*/ Siri* |
	Mean/ povprečje	Lower/najnižja vrednost	Upper/najvišja vrednost	Mean/ povprečje	Lower/najnižja vrednost	Upper/najvišja vrednost	Mean/ povprečje	Lower/najnižja vrednost	Upper/najvišja vrednost	Mean/ povprečje
2000	40.94	2.78	79.11	35.26	11.02	59.51	9.19	3.09	15.29	97.00
2001	38.37	4.46	72.29	36.58	11.94	61.21	9.23	3.14	15.31	102.70
2002	35.92	6.11	65.72	34.96	10.52	59.40	9.59	3.06	16.12	102.70
2003	33.17	6.43	59.91	35.76	10.84	60.69	10.18	3.41	16.95	110.30
2004	31.63	7.00	56.25	34.89	10.55	59.23	10.87	3.96	17.77	114.10
2005	29.27	7.54	50.99	36.37	11.95	60.79	12.38	4.17	20.59	119.80
2006	27.15	7.85	46.45	35.96	11.33	60.58	13.08	3.87	22.28	116.00
2007	28.16	10.39	45.94	31.28	13.48	49.09	13.12	3.80	22.43	114.10
2009	24.77	8.27	41.28	29.21	11.38	47.03	12.58	3.81	21.36	123.30

* The confidence interval for Cheeses could not be calculated because the HBS data provided only the total sum of consumed cheeses per year./ Intervala zaupanja pri skupini sirov ni bilo možno določiti, saj podatki raziskave o porabi v gospodinjstvih opredeljujejo le skupno letno porabo sirov.

In comparison to other foods with much higher sodium content (e.g. salami, sausages, dry meat etc.), the highest contribution to SAPF was represented by white bread (239 mg Na/p/day; 11.1% of SAPF), since its purchased quantity was rather high (42 mg/p/day). It was similar with SA in brown bread (89 mg Na/p/day; 4.1% of SAPF), mixed bread (76 mg Na/p/day; 3.5% of SAPF), cow's milk (47 mg Na/p/day; 2.2% of SAPF) and rolls (40 mg Na/p/day; 1.9% of SAPF). Otherwise, foods with higher sodium content obviously contributed a large part of the daily SA as well; various salamis contributed 9.3% of SAPF (200 mg Na/p/day), cheeses 5.1% (110 mg Na/p/day), dry meat 3.7% (80 mg Na/p/day) and prosciutto 2.7% (60 mg Na/p/day), while various sausages, frankfurters (hot-dog) and bacon separately contributed 1.9% to SAPF (40 mg Na/p/day). Mixed bread contributed up to 3.5% to SAPF and was purchased in 15.10 g/p/day, while dry meat contributed almost the same 3.7% to SAPF but was purchased in only 4.55 g/p/day.

All food subcategories listed in Table 3 still have the sodium content above the FSA 2012 sodium reduction targets (27). In the 2009 HBS survey, in the food subcategory for bread and bakery products, only toast had a sodium content below the target, while other breads, rolls and breakfast cereals, meat products and processed vegetables and cheeses had sodium contents above the targets.

4 DISCUSSION

The present study indicates that the estimated average amount of sodium available for consumption based on the household food purchases in Slovenia was 2,104±132 mg/p/day (equivalent to ~5.3 g of salt per day). Regarding the contribution of particular food groups to total SAPF, we found that bread bakery products and meat products were the major sources of sodium from purchased foods. The consumption of bread and bakery products, representing one of the food groups that mainly contribute to total household SA, decreased in the period 2000-2009. A similar trend was noticed in meat products, whose purchase started decreasing after 2006, when Slovenia has started a nationwide program of population reduction of salt intake. According to the recommended maximum sodium limit of 2,000 mg per healthy adult daily (28), we estimated that bread and bakery products represent 35.0% (761 mg Na/day) of the recommended quantity and meat products 27.9% (597 mg Na/day). Despite the smaller purchased quantities of higher-sodium foods (e.g. sausages, prosciutto, dry meat, pickled cucumbers) in comparison to larger purchased quantities of the medium-sodium foods (e.g. white

bread, mixed bread, brown bread, milk, rolls), both food groups contribute significant amounts of sodium in the diets of Slovenians. Therefore, these two food groups are estimated to represent almost 65% of the recommended daily intake of sodium. These estimates suggest the need for inclusion of these items in the reformulation targets for a population salt reduction strategy. Results from the present analysis indicate that food subcategories with the largest contribution to SAPF did not meet FSA 2012 Na reduction targets, and its adherence would lower the average salt intake if applied incrementally over the next ten years. Gradual, incremental reduction by 4% annually in the salt content of processed food can be achieved without consumers detecting the reduction (29).

A number of studies have been carried out to assess the sodium availability from purchased food. Sources of dietary sodium vary largely worldwide. The review of some compared European, Canadian and USA studies can be seen in Table 5.

The differences in dietary sodium availability between countries may be due to the variable selection of foods within food groups as well as sodium content of selected foods. Differences also depend on gender, age, cultural and socio-economic factors. As seen in a Canadian survey (33), there are different impacts of sodium content of foods and their quantity purchased by consumers on estimation of SAPF.

The average salt intake of the Slovenian population, assessed by 24h urinary sodium excretion, is 11.3±4.9 g salt/d, well above the WHO recommendations (5g). This may indicate that ready-made meals, most semi-prepared foods and added salt during cooking and at the table, which the present study does not account for, are important sources of salt in the diet as well as dietary habits. Since the comprehensive national salt reduction program started in 2010, we expect that daily salt consumption in all population groups will reduce in time, and the strategy should be combined with education and behavioural interventions. The CINDI study in Slovenia reported that the number of adults who never salted their ready meals at the table has increased in the period 2001 – 2008 from 41.4 to 50.8% (34), which is a positive change of dietary habits.

In 2012, we conducted a survey on the average salt content of randomly selected meals from several types of restaurants (fast food restaurants; Slovenian, Chinese, Mexican, Spanish and Italian restaurants). We found that analysed prepared meals (N - 35) contain on average from 0.7 to 1.9 g of salt per 100 g (35).

The strength of the present study is that we established a comprehensive food composition database to monitor the dietary sodium availability in Slovenia

Table 5.   The outline of research on the sodium availability in food from various European countries.
Tabela 5. Pregled raziskav o razpoložljivosti natrija v hrani v Evropi.

Country/ Država	Method/ Metoda	Main sodium sources/Glavni viri natrija	References/ Reference	Year of survey/ Leto raziskave
Ireland/Irska	7-day estimated food record/7-dnevni prehranski vnos	970 mg/p/d (meat and fish)/ mg/o/d (meso in ribe) 840 mg/p/d (bread and rolls)/ mg/o/d (kruh in pekovsko pecivo) 270 mp/p/d (milk and milk products)/ mg/o/d (mleko in mlečni izdelki) 230 mg/p/d (soups, sauces, miscellaneous foods)/ mg/o/d (juhe, omake, ostala živila) 150 mg/p/d (pastries)/mg/o/d (slaščičarska peciva) 140 mg/p/d (breakfast cereals)/ mg/o/d (žita za zajtrk) 130 mg/p/d (vegetables and processed vegetables)/ mg/o/d (zelenjava in konzervirana zelenjava) 95 mg/p/d (savouries e.g. pizza, mixed pasta dishes)/ mg/o/d (pice, jedi iz testenin) 194 mg/p/d (other foods)/ mg/o/d (ostala živila)	Irish Universities Nutrition Alliance (Summary Report) (30)	2001
United States of Amerika (USA), United Kingdom/ Združene države Amerike (ZDA), Združeno kraljestvo	24-hour dietary recall/ Metoda jedilnika prejšnjega dne	1,180 mg/p/d (bread, cereals and grains) (UK)/mg/o/d (kruh, žita in žitni izdelki) (Združeno kraljestvo) 700 mg/p/d (processed red meat, poultry, eggs) (UK)/mg/o/d (konzervirano rdeče meso, perutnina, jajca) (Združeno kraljestvo) 170 mg/p/d (soups) (UK)/mg/o/d (juhe) (združeno Kraljestvo) 280 mg/p/d (processed vegetables) (UK)/mg/o/d (konzervirana zelenjava) (Združeno Kraljestvo 710 mg/p/d (bread, cereals and grains) (USA)/ mg/o/d (kruh, žita in žitni izdelki) (ZDA) 440 mg/p/d (processed red meat, poultry, eggs) (USA)/mg/o/d (konzervirano rdeče meso, perutnina, jajca) (ZDA) 300 mg/p/d (dairy products) (USA)/mg/o/d (mlečni izdelki) (ZDA) 260 mg/p/d (sauces, salad dressings) (USA)/mg/o/d (omake, polivke za solate) (ZDA)	Anderson et al. (31)	2010
Finland/ Finska	/	630 mg/p/d (from bread)/ mg/o/d (iz kruha) 1930 mg/p/d (meat and meat products)/mg/o/d (meso in mesni izdelki) 140 mg/p/d (cheeses)/mg/o/d (siri)	Mannisto et al. (32)	2003

with representative national HBS data. However, the study also has a number of limitations that should be considered when interpreting the findings. First, for determining the average sodium content in food subcategories we grouped a variety of food products that may vary in salt content, which is characteristically true for meat products. We applied food product labels and generic data from food composition tables; only a limited number of laboratory analyses were used for determining sodium content of foods. The original purpose of HBS data collection is to provide data on household total consumption as an input to national accounts. Therefore, the estimates on food consumption are quite limited and cannot fulfil the same needs as some other dietary recall surveys. The most important reason that we used the HBS data is that in Slovenia more detailed data have not yet been collected. The important weakness of our study using the HBS data is that households keep diaries for two weeks. According to the analyses performed during the last decade, the consumption during the second week is much lower than the consumption during the first week, which is an important response error. Furthermore, we acknowledge that our results of average sodium availability in purchased foods is only an estimation that we could use to monitor through the years to develop and evaluate the sodium reduction programs and not an estimation of salt intake on a personal level.

5 CONCLUSIONS

In summary, we have identified foods with the largest contribution to total SAPF in Slovenian households for the period 2000–2009 and estimated average sodium availability from purchased foods.

Our study indicates that a large proportion of the daily sodium intake of Slovenians (in total exceeding the daily recommended intake levels) comes from a limited group of food items. Furthermore, our estimates, taken together with our population assessment of salt intake (16), suggest that ready-made meals and most semi-prepared foods would be important contributors to total salt intake and that added salt during cooking and at the table might also contribute to a higher proportion of the daily salt intake than previously thought. The salt content of meals eaten away from home is generally assumed to even be higher than those prepared at home. These data provide clear evidence for an inclusion of these items in the priority list for reformulation. At the same time, our data suggest that an increase in consumer awareness may still be required to modify behavioural habits of discretionary use of salt.

To monitor the dietary sodium availability in Slovenia, representative national HBS data were used. Therefore, our study had some limitations and weaknesses, so proper nutritional surveys and similar studies in Slovenia are needed to upgrade them.

In Slovenia, we adopted the joint WHO/FAO recommendations that state that the population nutrient intake goal for salt should be less than 5 g/day. A national programme for reducing salt intake needs to be implemented through combined efforts of national campaigns and initiatives, involvement of industry to achieve reformulation of food production, intensive interventions and primary care or population prevention programmes as well as consumer education. The most important steps in reducing salt intake are developing labelling of the salt contents in foods to help consumers to choose foods with less salt (36). All effective strategies are encouraged to reach the upper recommended salt intake level, which is less than 5 g/day according to the World Health Organisation (11) and according to the Nutrition Action Plan for Slovenia (37). However, further analysis and monitoring are needed.

Total salt intake in Slovenian adults significantly exceeds the WHO upper limit. Therefore, it is clear that implementation of a national programme for reducing salt intake should also focus on collaboration with the food industry and on production of low-salt or reduced-salt foods.

References

1. Campbell N, Correa-Rotter R, Neal B, Cappuccio FP. New evidence relating to the health impact of reducing salt intake. Nutr Metab Cardiovasc Dis 2011; 21: 617-9.
2. Strazzullo P, D'Elia L, Kandala N-B, Cappuccio FP. Salt intake, stroke and cardiovascular disease: a meta-analysis of prospective studies. Br Med J 2009; 339: b4567
3. Vedovato M, Lepore G, Coracina AR, Dodesini AR, Jori E, Tiengo A et al. Effect of sodium intake on blood pressure and albuminuria in type 2 diabetic patients: the role of insulin resistance. Diabetologia 2004; 47: 300–3.
4. Cumming RG, Mitchell P, Smith W. Dietary sodium intake and cataract: the blue mountains eye study. Am J Epidemiol 2000; 151: 624-6.
5. D'Elia L, Rossi G, Ippolito R, Cappuccio FP, Strazzullo P. Habitual salt intake and risk of gastric cancer: a meta-analysis of prospective studies. Clin Nutr 2012. doi: 10.1016/j.clnu.2012.01.003.
6. Cappuccio FP, Kalaitzidis RG, Duneclift S, Eastwood JB. Unravelling the links between calcium excretion, salt intake, hypertension, kidney stones and bone metabolism. J Nephrol 2000; 13: 169-77

7. Jones-Burton C, Mishra SI, Fink JC, Brown J, Gossa W, Bakris GL et al. An in-depth review of the evidence linking dietary salt intake and progression of chronic kidney disease. Am J Nephrol 2006; 26: 268-75.

8. Teucher B, Dainty JR, Spinks CA et al. Sodium and bone health: the impact of moderately high and low salt intakes on calcium metabolism in postmenopausal women. J Bone Miner Res 2008; 23: 1477-85.

9. Dyer AR, Elliott P, Shipley M, Stamler R, Stamler J. Body mass index and associations of sodium and potassium with blood pressure in INTERSALT. Hypertension 1994; 23: 729-36.

10. Maučec Zakotnik J, Zaletel Kragelj L, Vegnuti M, Fras Z, Djomba JK. CINDI risk factor and process evaluation survey. Ljubljana: CINDI Slovenia, 2009.

11. World Health Organization. Guideline: sodium intake for adults and children. Geneva: World Health Organization, 2012: 2-3.

12. Deutsche Gesellschaft für Ernährung. About DGË. Available Jan 2, 2014 at: http://www.dge.de/modules.php?name=Cont ent&pa=showpage&pid=12. D-A-CH 2008, Referenzwerte der DGE, ÖGE, SGE/SVE. Referenzwerte für die Nährstoffzufuhr: (2008). 1. Auflage, 3. korrigierter Nachdruck 2008. Die Deutsche Gesellschaft für Ernährung e.V. (DGE), die Österreichische Gesellschaft für Ernährung (ÖGE), die Schweizerische Gesellschaft für Ernährungsforschung (SGE) sowie die Schweizerische Vereinigung für Ernährung (SVE). Frankfurt am Main: Umschau/Braus.

13. Cappuccio FP, Capewell S, Lincoln P, McPherson K. Policy options to reduce population salt intake. Br Med J 2011; 343: 402-5.

14. Elliott P. Salt intake around the world: how to measure and what are the key contributors? In: Reducing salt intake in populations: report of a WHO Forum and Technical Meeting. Geneva: WHO, 2006.

15. Hoare J, Henderson L, Bates CJ, Prentice A, Birch M, Swan G et al: The National Diet & Nutrition Survey: adults aged 19 to 64 years: summary report. TSO: London, 2004. Available Sept 10, 2012 at: http://www.food.gov.uk/multimedia/pdfs/ndns5full.pdf

16. Hlastan Ribič C, Zakotnik Maučec J, Vertnik L, Vegnuti M, Cappuccio FP. Salt intake of the Slovene population assessed by 24 h urinary sodium excretion. Public Health Nutr 2010; 13: 1803-9.

17. Espeland MA, Kumanyika S, Wilson AC, Reboussin DM, Easter L, Self M et al. TONE Cooperative Research Group: statistical issues in analyzing 24-hour dietary recall and 24-hour urine collection data for sodium and potassium intakes. Am J Epidemiol 2001; 153: 996-1006.

18. Khaw KT, Bingham S, Welch A, Luben R, O'Brien E, Wareham N et al: Blood pressure and urinary sodium in men and women: the Norfolk Cohort of the European Prospective Investigation into Cancer (EPIC-Norfolk). Am J Clin Nutr 2004; 80: 1397-403.

19. Štimec M, Kobe H, Smole K, Kotnik P, Širca-Čampa A, Zupančič M et al. Adequate iodine intake of Slovenian adolescents is primarily attributed to excessive salt intake. Nutr Res 2009; 29; 888–96.

20. Kobe H, Štimec M, Hlastan-Ribič C, Fidler Mis N. Food intake in Slovenian adolescents and adherence to the Optimized Mixed Diet: a nationally representative study. Public Health Nutr 2011; 24: 1-9.

21. Vertnik L. Ocena zaužite količine kuhinjske soli iz kupljenih živil: diplomsko delo. Ljubljana: Biotehniška fakulteta, Oddelek za živilstvo, 2008.

22. Bingham SA. The dietary assessment of individuals; methods, accuracy, new techniques and recommendations. Nutr Abstr Rev A 1987; 57: 706-42.

23. De Vriese S, De Backer G, De Henauw S, Huybrechts I, Kornitzer K, Leveque A et al. The Belgian food consumption survey: aims, design and methods. Arch Public Health 2005; 63: 1-16.

24. Slovenian National Statistics Act (OG of the RS No. 45/95 and No. 9/01)

25. Statistical Office of the Republic of Slovenia. Level of living: household budget survey. Ljubljana: Statistical Office of the Republic of Slovenia, 2010. Available Apr 15, 2010 at: http://www.stat.si/eng/novica_prikazi.aspx?id=4055.

26. Hlastan Ribič C, Kuhar A, Vertnik L, Fajdiga Turk V, Gregorič M, Pollčnik R et al. Analysis of the sodium composition of a representative sample of bread and bakery products and meat products: expertise. Ljubljana: Ministry of Health of the Republic Slovenia, National Institute of Public Health, 2010.

27. Food Standards Agency. Salt reduction targets for 2012. Available Mar 20, 2012 at: http://www.food.gov.uk/scotland/scotnut/salt/saltreduction.

28. World Health Organization. Diet, nutrition and the prevention of chronic diseases. In: Joint WHO/FAO Expert Consultation. Geneva: WHO, 2003.

29. He FJ, MacGregor GA. Salt intake, plasma sodium, and worldwide salt reduction. Ann Med. 2012; 44: S127-37.

30. Irish Universities Nutrition Alliance. North/South Ireland Food Consumption Survey: summary report. Available Dec 19, 2013 at: http://www.iuna.net/docs/NSIFCSummary.pdf

31. Anderson CAM, Appel LJ, Okuda N, Brown IJ, Chan Q, Zhao L et al. Dietary sources of sodium in China, Japan, the United Kingdom, and the United States, women and men aged 40 to 59 years: the INTERMAP study. J Am Diet Assoc 2010; 110: 736-45.

32. Mannisto S, Ovaskainen M-L, Valsta L, editors. The National FINDIET 2002 Study. Helsinki: National Public Health Institute, 2003.

33. Fischer PWF, Vigneault M, Huang R, Arvaniti K, Roach P. Sodium food sources in the Canadian diet. Appl Physiol Nutr Metab 2009; 34: 884-92.

34. Hlastan Ribič C, Maučec Zakotnik J, Kranjc M, Šerona A: Prehranjevanje. In: Artnik B, Bajt M, Bilban M, Borovničar A, Brguljan Hitij J, Djomba JK et al. Zdravje in vedenjski slog prebivalcev Slovenije: trendi v raziskavah CINDI 2001-2004-2008. Ljubljana: Inštitut za varovanje zdravja Republike Slovenije, 2012; 31-49.

35. Hlastan Ribič C, Blaznik U, Turk V, Kranjc M, Zupan U. Poročilo za Ministrstvo za zdravje o izvajanju raziskave "Določanje koncentracije natrija in kalija v urinu pri odraslih prebivalcih Slovenije" in analizi vsebnosti soli v živilih in obrokih. Ljubljana: Inštitut za varovanje zdravja RS, 2012.

36. Pietinen P, Valsta LM, Hirvonen T, Sinkko H. Labelling the salt content in foods: a useful tool in reducing sodium intake in Finland. Public Health Nutr 2008; 11: 335-40.

37. Republic of Slovenia National Assembly. Resolucija o nacionalnem programu prehranske politike 2005–2010. Ur.l. RS 39/2005. Ljubljana: Ministry of Health, 2005.