

Knowledge, Attitude and Practice About Salt Intake in Croatian Continental Rural Population

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Summary

High salt intake is important risk factor for hypertension, cardiovascular and cerebrovascular diseases. The aim of this study was to investigate knowledge, attitude and practice regarding salt intake in rural population in continental Croatia. Data were obtained by standardized questionnaire in 928 adult subjects (586 women and 342 men). Results have shown low level of awareness (~60%) of salt risk. Women were more aware about the harmful effects of salt and could identify some food with higher concentration of salt. Participants were not aware through which food is the highest salt intake. Our results urge the need for national projects and public health campaigns that would raise the awareness of salt intake, need for health education particularly for rural population. Food industry and nutritionists should become partners in this initiative.

Key words

salt intake, rural population, knowledge, education and health promotion, hypertension

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Introduction

Chronic non-communicable diseases are leading cause of death and disability in Croatia (CNIPH, 2010) and worldwide. Among many environmental factors, salt intake is one of the most important. Although data on the salt intake in Croatia are limited, existing studies showed that in general population salt intake is higher than recommended, same as in the majority of developed world where daily average intake varies between 12 and 16 g (WHO, 2006; Brown et al., 2009). Normal body functioning requires less than 4 g, that comes from natural sources (vegetables, fruits, meat) in regular diet. In developed and developing countries 75% of salt intake comes from industrially processed and semi prepared food, cereals and mostly baked products, as well as food eaten away from home (Brown et al., 2009; He et al., 2009; Jelaković et al., 2007; Jelaković et al., 2009; Jelaković et al., 2010; Ugarčić-Hardi et al., 2010). In Asian countries, in addition to processed food, high amount of salt is ingested through salt added in cooking and at the table (Brown et al. 2009).

Rural population

Definitions of rural and urban strongly depend on cultural context and are not equivalent for all populations and societies. Even more, in most of the countries there is no exact definition of rural that is rather a concept opposite to urban. In Croatia some authors define rural as a collective of persons in rural setting that has its own culture and functions different from other populations and whose members collaborate in order to satisfy its basic needs (Brkić et al., 1992). Organization for economic co-operation and development developed criteria based on population density, which 91.6% of the total Croatian territory classifies as rural with 88.7% of settlements situated in rural regions, and 47.6% of population living in rural regions. Out of 21 counties in Croatia, 14 are predominantly rural, 6 are significantly rural, and City of Zagreb is only urban county (Government of Republic of Croatia, 2008). This is certainly reflected on economic situation in the country as well as organization of health care and public health services. In terms of nutritional habits and lifestyle differences between urban and rural populations are present (Vitale et al., 2012; Sović et al., 2011; Musić-Milanović, 2010) mostly due to the source of income in rural areas that is food production. Average salt intake in general Croatian population is 13.3 ± 4.3 g/day for men and 10.2 ± 4.2 g/day for women (Premužić et al., 2010). Based on analysis of spot urine samples, Dika et al. (2010) showed that salt intake in continental rural population is 8.76 ± 1.5 for females and 9.06 ± 1.47 for males, which is 1.8 times higher than recommended by WHO. Vitale et al. (2012) showed even higher values and failed to find any difference between urban and rural population regarding salt intake, the difference is in the type of food and food preparation. Education, employment and monthly income have significant impact on knowledge on nutrition and health, particularly importance of salt intake. Education level in rural areas in Croatia is lower than in urban areas, as a consequence of general depopulation and reduction of number of elementary and high schools in rural areas. In most of the counties 20-35% of inhabitants have only elementary school (Government of Republic of Croatia, 2008).

The aim of this study was to investigate knowledge, attitude and practice about salt intake in continental rural popu-

lation in Croatia. These results could serve for understanding specificities of these populations and as starting point for targeted education and public health intervention in rural regions. Also such data could serve as help in prevention and treatment of chronic non-communicable diseases in primary health care setting in rural areas.

Subjects and methods

A population based epidemiologic investigation was initiated in four rural villages in Brodsko-Posavska County, (Banovci, Bebrina, Kaniža, Klakar) in 2005. Sample was obtained on door-to-door basis approaching adult resident (older than 18 years of age). All households in the target villages were approached. If no one was at home, interviewers returned over the next several days and attempted to make contact with the resident. Individuals agreeing to participate in the study completed an extensive survey administered by the study personnel along with spot urine and fasting blood sample. Out of 1081 individuals who were enrolled, 928 examinees, (586 females and 342 males) were considered eligible for further analyses. Participation rate was 75.6%. Questionnaire provided information on demographic characteristics, history of hypertension, information on knowledge and attitude of harmful effect of salt including practice on salt use in preparing of food, and treatment of hypertension. The data were analyzed using descriptive statistics and χ^2 test. As statistically significant was considered $p < 0.05$. Study was approved by the Ethical Board of School of Medicine University of Zagreb, Croatian National Institute of Public Health and General Hospital "Dr. Josip Benčević" Slavonski Brod, and all participants gave written informed consent.

Results

Results revealed that average values of diastolic and systolic blood pressure for both women and man were within normal range, but maximum values along with standard deviation indicate that certain number of participants is well above recommended values of 90/140 mmHg. It is the same with waist circumference where cut off point is 88 cm for women and 102 cm for men.

Results on knowledge, attitude and practice related to salt consumption are presented in Table 2. and Table 3. To the question "Do you think that salt is harmful for health?", more than 60% participants responded positively, with significant difference between genders (man 61.7%, women 66.9%; $p=0.007$).

There is statistically significant difference between genders in opinion on salt intake ($p=0.0001$). Women thought more frequently that their salt intake is inappropriately high. Results of analyses of the answer given to the question "Have you ever heard about harmful effects of the salt, and from whom?" are presented in Table 3.

As good news one could consider information that more than 50% of examinees heard about harmful effects of the salt from the family medicine doctor. However, on the other hand it is disappointing that other 50% have not got this important information from medical personnel. Both media and family and friends play important role in getting information about harm-

Table 1. Basic characteristics of studied group

| | Average \pm SD | Min- Max |
|---------------------|--------------------|----------|
| Woman | | |
| Age | 55.60 \pm 17.38 | 19-93 |
| Diastolic pressure | 82.40 \pm 12.58 | 47-123 |
| Systolic pressure | 138.99 \pm 24.99 | 83-222 |
| Weight | 72.20 \pm 15.45 | 40-170 |
| Waist circumference | 93.46 \pm 16.11 | 40-147 |
| Men | | |
| Age | 53.64 \pm 16.94 | 19-85 |
| Diastolic pressure | 82.48 \pm 6.02 | 28-122 |
| Systolic pressure | 141.83 \pm 29.05 | 38-220 |
| Weight | 83.45 \pm 14.92 | 50-146 |
| Waist circumference | 99.26 \pm 13.49 | 60-143 |

Table 2. Examinee's opinion on her/his salt intake

| Gender | My salt intake is normal | My salt intake is too high | My salt intake is too low |
|---------------|--------------------------|----------------------------|---------------------------|
| Men (N=336) | 131 (39.0%) | 200 (59.5%) | 5 (1.5%) |
| Women (N=580) | 147 (25.3%) | 421 (72.6%) | 12 (2.1%) |

Table 3. Examinee's source of information about the harmful effects of the salt

| Gender | Never heard until now | Heard from family medicine doctor | Heard from family and friends | Herd from public media |
|---------------|-----------------------|-----------------------------------|-------------------------------|------------------------|
| Men (N=342) | 61 (17.8%) | 199 (58.2%) | 98 (28.6%) | 127 (37.1%) |
| Women (N=586) | 83 (14.2%) | 370 (63.1%) | 200 (34.1%) | 229 (39.1%) |

Table 4. Examinees opinion on necessity for hers/his salt reduction

| Gender | Yes | No | Do not know |
|---------------|-------------|-------------|-------------|
| Men (N=334) | 176 (52.7%) | 108 (32.3%) | 50 (15%) |
| Women (N=580) | 357 (61.6%) | 169 (29.1%) | 54 (9.3%) |

Table 5. Examinees opinion on readiness to change habits of hers/his salt use

| Gender | Yes, I could | No, I could not | Do not know |
|-----------|--------------|-----------------|-------------|
| M (N=335) | 269 (80.3%) | 35 (10.5%) | 31 (9.2%) |
| F (N=575) | 507 (88.2%) | 44 (7.6%) | 24 (4.2%) |

Table 6. Knowledge on sources of salt intake in every day meals

| Gender | Meat | Cured / smoked meat | Bread | Salad | Potatoes and vegetables | Seasoning mix | Soup | Cheese | Don't know |
|---------------|-------------|---------------------|----------|----------|-------------------------|---------------|-----------|----------|------------|
| Men (N=320) | 110 (34.4%) | 179 (55.9%) | 1 (0.3%) | 5 (1.6%) | 6 (1.9%) | 4 (1.2%) | 6 (1.9%) | 0 | 9 (2.8%) |
| Women (N=572) | 195 (34.1%) | 309 (54%) | 2 (0.3%) | 6 (1.1%) | 9 (1.6%) | 22 (3.8%) | 16 (2.8%) | 1 (0.2%) | 12 (2.1%) |

ful effects of the salt. There were no statistically significant difference in getting advice between genders ($p=0.27$). Answers to the question "Do you think it is necessary to reduce salt intake?" are shown in Table 4.

Although more than 50% confirmed that it is necessary to reduce salt intake, it is concerning that approximately 30% do not think the same. There is statistically significant difference between genders regarding opinion on salt reduction ($p=0.008$) and as in previous questions women were much better than men. Answers to the question "Do you think you could change the habit of current salt use?" are presented in Table 5.

Majority of subjects believed that they could change their habits regarding salt intake. Again women are statistically more willing to change this habit ($p=0.002$). The last question was "What do you think which food products in your daily meals have the highest salt content?" are presented in Table 6.

Results show that most of the participants recognized meat, particularly cured/smoked meat as important source of the salt. It is concerning that bread and cheese were not recognized as source of salt intake by almost of all subjects. Women recognized seasonings as possible important source of the salt intake, prob-

ably because in most of the families women are cooks. There is no statistically difference in opinion on sources of salt intake in every day meals between genders ($p=0.08$).

Discussion

Poor eating habits along with low physical activity and smoking are important determinants of bad life style not only in developed but also in developing and transitional countries significantly contributing to the premature morbidity and mortality. Differences between urban and rural population were observed in several studies, indicating that knowledge, practice and beliefs in various populations depend on cultural and economic factors. In Croatia, data on health behavior and health indicators in rural populations are limited. Previously we have shown that 71% of rural population was aware that salt intake is related to

hypertension, 70% did not know main sources of salt intake in every day meal, and only 39.2% were advised by health professionals (Sović et al., 2011). Results from this survey show similar findings; approximately 65% of participants knew that high salt intake is harmful for the health. Both studies revealed unsatisfactory advising from the primary health care professionals and obvious lack of, or difficulties in communication between users and health care givers in rural settings. Only few participants thought that their salt intake is normal, and only some of them think that they could change their habits regarding salt intake. These results could be explained by the rural region where studies were conducted. In more developed region participants were more advised by primary care doctors, they were more willing to change their habits as oppose to the older participants in the remote and poor rural areas. Women were more aware of harmful effects, they were more prone to change habits and they could identify more sources of salt intake, particularly popular local brand of seasoning mix. On the other hand men get far more advice from primary health care doctors what could be explained by the fact that this is still pronounced patriarchal social structure where men who economically take care of the family are conditionally more important and/or maybe believe that advice given to the man will somehow reach the whole family. On the contrary, many studies have shown that women are those who prepare the meals and in that way even unconsciously develop certain nutritional habits, tastes and lifestyle that for most of the people remain for the rest of the life and are even transferred to next generations. Studies also have shown that in Croatia rural and urban populations have similar salt intake but the source is different, while in urban population main source is industrially processed food, in rural population that source is homemade cured meat (Premužić et al., 2010; Jelaković et al., 2009; Vitale et al., 2012). These observations strongly suggest that health education is needed for both populations but probably using different approaches. For education to be successful social, cultural and regional specificities must be taken into account as well as economic potential of population in order to offer acceptable solutions. Traditional way of food preparation is hard and needless to change, but it is important to stress good and bad sides of such a practice, and make intervention in some other segment.

In Croatia cardiovascular diseases are leading cause of premature deaths and one of the most important reasons for hospitalization. According to the results of EH-UH study, 37% of the adult population in Croatia is hypertensive. As in most of the countries women are more aware, more often treated, and blood pressure goal is more frequently achieved than in men (Jelaković et al., 2007). Lack of communication between patients and physicians is one of the most important reasons for global failure in blood pressure control. Unfortunately there are also no primary prevention programs on the national level and the whole community is seeking for long lasting general health plan that should be led by government. Salt reduction program must be one of priorities in our country as it is in several other European countries (England, Finland, Portugal) where success is already visible. Lack of having such a program is certainly loss for patients but also for the country budget because salt reduction is good and cheap non-pharmaceutical treatment that could be easily implemented with cooperation of food industry,

and it is easy to follow by patients. The financial aspect should be emphasized as well; medicine expenditure in Croatia is more than 120 million of Euro per year per medicine for cardiovascular disease only (HALMED, 2009). Standardized death rate in age group 0-64, of cardiovascular diseases and diseases of circulatory system per 100.000 populations is decreasing in past twenty years but it is still 20-30% higher than in EU-27. Out of neighboring countries only Hungary have higher death rate in this categories (CNIPH, 2010). These data indicate strong need for intervention even more because populations living in rural areas are at greater risk as of limited access to health care. In addition, rural population is mainly older population, when lifestyle and economic situation make health promotion and change of nutritional habits difficult. Many studies in developed countries have shown that at the same time salt is valued for its traditional role in food preserving, and it has negative connotation in biomedical sense (Smith et al., 2006) that could be applicable for our participants as well. Vitolins et al., 2007 have shown that many national strategies and health education in USA does not reach rural population particularly older, and same findings were present in Hungary (Paulik et al., 2010) and Belgium (Staessen et al., 1997). Fegelmalm et al. (2006) showed that community health programs for elderly population are far more successful in urban and semi urban areas than in rural. Also some authors (Arcuy et al., 2001) argue that approach to population is very important what includes understanding what is the concept of health in various rural populations. Health professionals often impose their definitions, while in many cases particularly in rural populations health could have different meaning. Arcuy et al. (2001) showed that in rural communities in US definition of health overlaps with biomedical model to some extent, but for them staying healthy means maintaining ability to function in community. These findings are later confirmed by Fujiwara et al. (2010) who argues that rural communities are often more connected than urban, and family and community support could be good motivation for behavior change. These findings indicate that health educators and health promotion programs cannot assume that older patients will share their interpretation of health, and therefore health intervention might fail. Also following this assumption many interventions forget that nutritional standards could be difficult to meet due to the change in taste in older population, deterioration of chewing ability, and in many cases loss of spouse and decline of intellectual activity (Kwon et al. 2006; McDonald et al., 2000; Quandt et al., 2005; Vitolins et al., 2002). Crouch et al. (2011) have shown that in rural Australian population dietary modification introduced as intervention program through primary health care did not sustained for longer period of time. Economic standards strongly influence nutritional standards. In Croatia many rural communities are poorly connected with urban centers and population rely on their own food production and preservation due to the lack of money for transport and purchasing food. Pork meat, which is mostly used for curing, is cheap meat easy to grow in any climatic conditions, and mostly consumed in Croatian rural areas. As stated before, traditional food preserving and preparation is hard to change, especially when population has lower educational level, low income and new technologies require additional investment. Therefore, nu-

tritionists and dietary experts should come up with modified recipes that would retain as much as possible original technologies and tastes. Sometimes standard advises given by health professionals are easier to follow in urban setting, particularly when it comes to use of exotic or other than they usually grow, seasonings as alternative to salt. This is as important as global reduction in processed food what should be organized under umbrella of government and cooperation with food industry. WHO (2006) advises that daily salt intake should be lower than 5 g (equals 2400 mg Na). In many cases sodium intake through food is forgotten. For example baking soda for homemade bread and sweets contains 1.6 Na per 10 g. In Croatia, as in majority of countries bread and bakery are the most important sources of salt/sodium intake. Also seasonings like mustard, ketchup, flans that are part of menu in rural populations as well contain around 1 g of Na per 100 grams of food.

In 2005 WASH (World Action on Salt and Health) program started. European Union in 2007 started initiative that as main goal had reaching WHO recommendations on daily salt intake of 5g (Jelaković et al., 2009). Plan have five points, which relate to general data collection on salt intake, graduate salt decrease in food products (4% per year), negotiations with food industry and health education and awareness rising. In 2007 Croatian action on salt and health (CRASH) started as a part of WASH and national program for reducing salt intake (Jelaković et al., 2009). In 2008 CRASH was included in the action of the WHO on mapping sodium intake in European countries. According to the EU plan, salt content should be labeled on all food articles, but in Croatia still it is not obligatory to declare concentration of salt in the product. CRASH has organized several educational activities for general population including rural areas, but also for physicians and nurses (Jelaković et al., 2009). Actions on national level that include decrease of salt concentration in industrial products or for example not putting salt on the tables in restaurants could be of little help for rural population. All these data indicate that uniformity of health education and health promotion does not achieve positive results. Specificities of rural populations in Croatia should be investigated and interventions accordingly constructed. It seems that one of the main obstacles could be low educational level of population that is connected with economical status as well. In general, lower education is an obstacle to introduction of new, more effective and more environmental friendly technologies in agricultural production that could start cascade of low production, low quality of products, low economic income and in the end low quality of health and life in general. More interventions on national level are needed, but at the same time strong involvement of primary health care that include physicians, nurses, nutritionist and dietary experts at individual level.

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