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Prevalence of behavioral risk factors of non-communicable diseases among urban and rural population in the Federation of Bosnia and Herzegovina

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ABSTRACT

Introduction: The objective of the paper is to analyze and to assess prevalence of the major behavioral risk factors among adult population (25-64 years of age) in the rural and urban areas in the Federation of Bosnia and Herzegovina (FBIH).

Methods: Data were taken from cross-sectional population survey on the health status population in the FBIH. To ensure a sample representative for the adult population in the FBIH it was applied the two-stage stratified systematic sample. The survey covered a total of 2735 adult population aged 25-64 years, of which 1087 in the urban areas and 1648 in rural areas.

Results: The prevalence of smoking among men in rural areas is significantly higher than among men in urban areas (69% vs. 55%), while the prevalence of smoking among women is higher in urban than in rural areas (45% vs. 31%). There is no statistically significant difference in prevalence of obesity and physical activity according to the age groups among men and women in the urban and rural areas. The frequency of changes in behavior related to acquiring healthy living habits in the rural areas is statistically significant among men and women, while in the urban areas there is no statistical significance among the sexes.

Conclusions:. The results indicate that there are no significant differences in prevalence of factor risks in urban and rural areas. Prevalence of unhealthy lifestyles is high, and the results should be used to improve standard planning of health promotion-prevention programs.

Keywords: smoking; obesity; urban-rural differences

INTRODUCTION

The health care systems of countries are facing challenges of ensuring comprehensive protection aimed at reducing burden of diseases and early death from the non-communicable diseases (NCDs) through

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integrative approaches from health promotion and disease prevention to the management of NCDs at strategic level (1).

Smoking, unhealthy eating habits and lack of physical activity with consequent obesity are proven major risk factors for NCDs, especially diseases of the cardiovascular system (CVDs), as well as for subsequent events; hypertension, glucose intolerance and hyperlipidemia. These risk factors are also indicators of major preventable health problems and their regular monitoring within the population makes a good basis for setting and implementing evidence-based preventive and promotional programs (1,2).

In the last decades the health care systems of countries with clear and strong recommendations of the World Health Organization (WHO) implement activities to reduce prevalence of these risk factors that are proven to be preventable. These are not activities of health care sector only, but also activities of other government bodies, which represents the base of the new WHO European policy "Health 2020" (3,4).

The increase in emergence of NCDs is recorded in the Federation of Bosnia and Herzegovina (FBIH) through the figures from the regular health-statistical data, including mortality and morbidity data (5,6). Prevalence of the risk factors is assessed from periodic cross-sectional population surveys.

The first cross-sectional study population and risk factors for NCDs in a representative sample of the population in the FBIH was conducted in the autumn of 2002. The survey conducted in FBIH in 2002 was taken as a baseline survey, when significant prevalence of smoking habits, physical inactivity and obesity, as critical risk factors for emergence of NCDs, was assessed among adult population in the FBIH (7).

Ten years later, in 2012, a cross-sectional survey was conducted on the sample of adult population aimed at evaluating state of health of population and assessing prevalence of risk factors in the FBIH. The survey was conducted in line with internationally established standards and protocols (8-10).

The paper shows analyses and assessment of prevalence of main behavioral risk factors among adult population (25-64 years of age) in urban and rural areas in the FBIH in order to examine possibilities of existence of differences, which is necessary for designing evidence-based population programs and interventions.

METHODS

Data were taken from cross-sectional population surveys on the health status population in the FBIH. Population surveys were carried out by the Federal Ministry of Health (FMoH) and the Federal Public Health Institute (FPHI) in the period from November 2012 to January 2013, as a part of primary health care reform process in the FBIH with purpose to measure performance in the health care system and public health.

To ensure a sample representative for the adult population in the FBIH it was applied the two-stage stratified systematic sample. Sample frame is a master sample of visiting sites and households from 2009, which was prepared by the Federal Institute of Statistics (FIS).

The first sampling stratums were visiting sites stratified by type of settlement - urban and rural, and by the cantons in the FBIH (ten cantons). The second sampling stratums were households. The visiting sites were selected by Lahiri method of sampling, which means the selection probabilities are not equal, but the probability of selection is proportional to the size of the primary unit, wherein the size of the primary unit is represented by the number of secondary sampling units, or households within the primary unit. Households were selected by systematic method, which means that the choise probabilities were the same. Stratification of units was made according to the type of settlement (urban/rural). The allocation of households was made proportionally to size of settlement types, taking care to include all cantons in the FBIH. In this population were not included collective households such as student hostels, residential colleges, nursing homes, prisons etc.

Out of 1752 households that made the pattern in the FBIH, the survey was conducted in 1402 households (RR 80%). From this number, 40% of households were in urban areas and 60% in rural areas. Respondents were all adult members of the household aged 18 years and older. For the purpose of comparison with the results of a cross-sectional survey that was conducted in the FBIH in 2002, the document analyzed the results of the adult population aged 25-64 years. The survey covered a total of 2735 adult population aged 25-64 years, of which 1087 in the urban areas and 1648 in rural areas.

The study was conducted in accordance with the Helsinki Declaration, which defines the ethical principles of biomedical research on humans. All participants were informed of the purpose of research, and were explained that use of data is needed solely for research purposes. The study included a standardized questionnaire and anthropometric measurements.

The questionnaire included questions about behavioral risk factors (smoking, physical activity, nutrition habits), while anthropometric measurements included measurements of height, weight, blood pressure and biochemical analysis of capillary blood samples (blood sugar, cholesterol and triglycerides).

Information on smoking was obtained from a set of questions that were set to respondents. Daily smokers were respondents who currently smoke or who have smoked in the previous month prior to the survey.

Physical activity was estimated from a set of questions about the frequency of physical activity in leisure time. Respondents who identified themselves to exercise two or more times a week (issue related to the intensity of exercise that accelerates breathing or sweating), were all categorized as having moderate physical activity.

Increased awareness of risk factors and the change in eating habits, were both estimated by set of questions about habit changes in the past year.

Physical measurements, among others things, included the measurements of height and weight. Height was measured by an stadiometer that was attached to the wall or to a special holder. Weight was measured in light clothing using digital scales. Obesity has been described in terms of BMI (body mass index) and was expressed in kg/m^3.

Fieldwork was carried out by ten trained teams.

Statistical analysis

The data were analyzed using SPSS for Windows, version 17.0. Descriptive statistics was used to represent the data – index of structure and relative relations. Statistical significance was tested by χ^2 test. Frequency of each observed variable relative to the place of residence (urban/rural), sex and age subgroup was examined by descriptive statistical analysis.

RESULTS

Smoking

In the total sample in FBIH 37% of women and 63% of men are every day smokers. Prevalence of smokers among men in rural areas is significantly higher than among men in urban areas (69% vs. 55%), while the prevalence of smoking among women is significantly higher in urban than in rural areas (45% vs. 31%).

Prevalence of daily cigarette smokers in urban areas is increased by the respondents' age among both sexes, especially among women. In the group of respondents between 55-64 years of age the prevalence is equal both among men and women (18%). There is no statistically significant difference in prevalence of smoking according to the age groups among respondents of both sexes in the urban areas (λ^2=3.2 df=2 p=0.358) (Table 1).

In the rural areas prevalence of smoking habits is higher among men and lower among women and it also increases with age of respondents of both sexes, especially among women. In the group of respondents between 45-54 years of age prevalence

TABLE 1. Prevalence of smoking according to age and sex, urban/rural differences

	Urban areas Daily smokers		Rural areas Daily smokers		p value
	N	%	N	%	
Men	197	55	329	69	p<0.01
Women	163	45	148	31	p<0.01
Age (years)					
Men 25-34 y	53	27	66	20	p>0.1
Women 25-34 y	36	22	33	22	p>0.1
Men 35-44 y	53	27	104	32	p>0.1
Women 35-44 y	38	23	41	28	p>0.1
Men 45-54 y	55	28	87	26	p>0.1
Women 45-54 y	59	36	53	36	p>0.1
Men 55-64 y	36	18	72	22	p>0.1
Women 55-64 y	30	19	21	14	p>0.1

is higher among women than among men (36% vs.26%). There is no statistically significant difference in prevalence of smoking according to the age groups among respondents of both sexes in the rural areas (λ^2=6.91 df=2 p=0.075) (Table 1).

Obesity

In total 22% of respondents in the FBIH is obese (BMI >30 kg/m^2). Prevalence of obesity in urban areas is 20%, while the prevalence of obesity in rural areas is 24%. In the urban areas prevalence of obesity is higher among men than among women (18% vs. 17%), while in the rural areas prevalence of obesity is higher among women than among men (37% vs. 28%). There is no statistically significant difference in prevalence of obesity among men and women in the urban areas and rural areas (Table 2).

Prevalence of obesity in the urban areas increases by the respondent's age among both sexes. There is no statistically significant difference in prevalence of obesity according to the age groups among men and women in the urban areas (λ^2=5.50 df=3 p=0.138) (Table 2).

Prevalence of obesity in the rural areas increases by the respondent's age among both sexes, and among both sexes aged between 35-54 years it grows much faster than in the urban areas. Prevalence of obesity is lower among both sexes between 55-64 years in the rural areas than among respondents in the urban areas. There is no statistically significant difference in prevalence of obesity according to the age groups among men and women in the rural areas (λ^2=4.41 df=3 p=0.250) (Table 2).

Physical activity

Physical activity was measured as a physical activity lasting 30 minutes where the respondent would be out of breath or sweat, but in different intervals during seven days. 2-3 times a week as the recommended frequency of the physical activity. Total of 36% of respondents in the FBIH is physical inactive, while 14% of respondents is physically active 2-3 times a week, whereof 45% are women and 55% are men.

The percent of physically active women and men aged between 25-34 years is the same in urban areas. Generally, there is no significant difference in the recommended physical activity among men and women in the urban areas (λ^2=3.43 df=3 p=0.330) (Table 3). The percent of physically active women and men, especially in younger age groups, is the same in urban areas. Generally, there is no significant difference in the recommended physical activity among men and women in the rural areas (λ^2=2.66 df=3 p=0.446) (Table 3).

Healthy behaviors

The respondents were asked whether, in the last

TABLE 2. Prevalence of obesity according to age and sex, urban/rural differences

	Urban areas BMI>=30		Rural areas BMI>=30		p value
	N	%	N	%	
Men	111	18	166	28	p>0.01
Women	105	17	220	37	p>0.01
Age (years)					
Men 25-34 y	14	13	13	8	p>0.01
Women 25-34 y	8	8	20	9	p>0.01
Men 35-44 y	20	18	46	28	p>0.01
Women 35-44 y	10	9	42	19	p>0.01
Men 45-54 y	31	28	54	32	p>0.01
Women 45-54 y	37	35	83	38	p>0.01
Men 55-64 y	46	41	53	32	p>0.01
Women 55-64 y	50	48	75	34	p>0.01

TABLE 3. Physical activity according to age and sex, urban/rural differences

	Urban areas Physical activity 2–3 times a week		Rural areas Physical activity 2–3 times a week		p value
	N	%	N	%	
Men	97	24	119	30	p=0.120
Women	92	24	85	21	p=0.120
Age (years)					
Men 25-34 y	32	33	29	24	p>0.01
Women 25-34 y	34	37	23	27	p>0.01
Men 35-44 y	22	23	36	30	p>0.01
Women 35-44 y	13	14	21	25	p>0.01
Men 45-54 y	19	19	28	24	p>0.01
Women 45-54 y	25	27	27	32	p>0.01
Men 55-64 y	24	25	26	22	p>0.01
Women 55-64 y	20	22	14	16	p>0.01

12 month, they have changed their behavior related to the diet, increase in physical activity, giving up smoking and alcohol consumption.

The changes in behavior are more frequent in the older age groups, between 45-64 years of age. Generally, the most frequently changed habits relate to increase in fruit and vegetable consumption, as well as reduction of fat intake, while the reduction of smoking habits was recorded only in small percent.

The frequency of changes in behavior related to acquiring healthy living habits in the rural areas is statistically significant among men and women, because women in rural areas change living habits rather more frequently than men, while in the urban areas there is no statistical significance among the sexes (Figure 1).

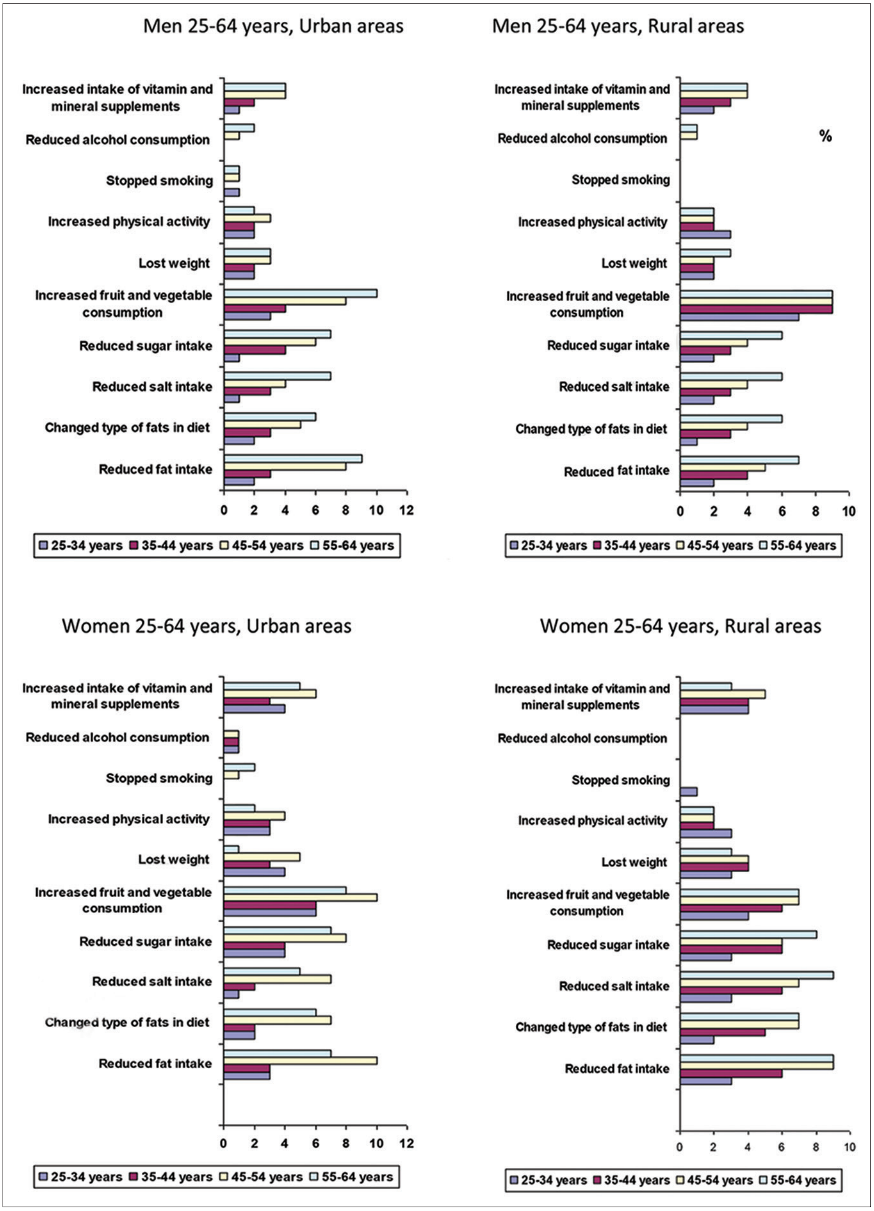

FIGURE 1. Prevalence of changes in behavior according to the area, age and sex, urban/rural difference.

DISCUSSION

The prevalence of risk factors for NCDs in the FBIH in the last decade was evaluated through a few isolated studies on risk factors and health behavior in different samples of the population.

The first cross-sectional study population and risk factors for NCDs in a representative sample of the population in the FBIH was conducted in 2002. The prevalence of risk factors related to the health behavior of the population in the study from 2002 year was relatively high and there were significant differences in the level of the main risk factors - smoking, physical activity and obesity in urban and rural areas (11).

Ten years later it was conducted a follow-up study in order to monitor trends in preventable risk factors and in getting real information about the profile of risk factors for NVDs among the adult population in the FBIH. Great significance of this research lies in representation of FBIH in both urban and rural areas, and the high response rate.

Data from routine health statistics in the FBIH show a slight increase in circulatory system diseases, particularly CVDs, followed by malignant diseases. Therefore, monitoring and control of risk factors are necessary measures to protect the health of the population. Conducting periodic surveys enables monitoring of trends and creation of evidences for development of public health activities and algorithms for clinical work within primary health care.

Results of cross-sectional studies identify smoking as the most important risk factor in the occurrence of NCDs among the adult population in the FBIH. Despite the existence of clear legislation in the FBIH regarding the limited use of tobacco products, the prevalence of smoking in the FBIH is still very high, what, among other things, speak in favor of an inconsistent implementation of the Law. Consistent implementation of the Law on the limited use of tobacco products in the FBIH, promotion of non-smoking places and work environment free of tobacco smoke should be basic measures. In accordance with the practice in EU countries and in the region, part of the revenue from excise taxes on tobacco products would be redirected to funding for preventive and promotional programs related to reducing smoking prevalence, what would treat causes and not consequences of the problem. As important actors in both prevention and promotional activities, apart from the health system, seems to be definitely local communities where people live. At the same time it is necessary to increase the knowledge and skills of healthcare workers in primary health care (PHC), especially for nurses, in treatments of smoking cessation, considering that the strengthening of PHC through continuous improvement of family medicine teams is a fundamental commitment to the reform of the health sector in the FBIH. These treatments should become standard practice in teams of family medicine in PHC, given the very high prevalence of smoking in the FBIH, which is significantly higher than in neighboring countries (12-13).

Obesity is one of major public health challenges in the 21st century. The prevalence of obesity from the 1980s nearly tripled in many countries of the European region, and consequently led to an increase in various physical disabilities and development of non-communicable diseases, especially diabetes mellitus. In the FBIH, the prevalence of obesity increases with age in both sexes. If we add this to an increasing prevalence of other risk factors in middle and old age, this creates an additional burden in the accumulation of unhealthy habits within the population. Enhancing public awareness about healthy eating and increasing knowledge about influences of obesity on health must be a method of everyday work in primary health care, in collaboration with the local community. Increasing prevalence of obesity in rural areas is significant and this should be given special attention in the future.

Prevalence of physical activity is insufficient and there is certainly a space for public health improvements. In recent population surveys conducted in Serbia, the prevalence of physical activity of the adult population was similar to those in the FBIH, indicating that the lack of physical activity in leisure time is almost culturally adopted a pattern of behavior in both the FBIH and the neighboring countries (14).

It is especially necessary to improve awareness of population about the importance of physical activity in all age groups. At the same time, it is necessary to create conditions for the massification of physical activity. The role of local communities in these activities is also necessary to be strengthened, as the creation of conditions for the implementation of physical activity in leisure time lies precisely within the places of residence of the population.

Changing behavior related to the acquisition healthy habits in the last year prior to the survey was low in both men and women, and there are no significant differences between urban and rural areas. Enhancing awareness of healthy habits is a long process and requires very lengthy preventive work. This is work that needs to be strengthened intensively in the coming period through individual and group counselings, work within the local community, particularly through the work of nurses in primary health care. The advantage of the FBIH can be continuous strengthening of family medicine teams in PHC, and obtained matrix with several important indicators which should serve as proof for posting prevention programs and increasing awareness of the risk factors. Experiences in many countries show that a well-planned health intervention programs at the community level in order to promote health and health behavior changes have good results (15-16).

The results of surveys showed no significant differences in the prevalence of risk factors for NCDs in both urban and rural areas. The prevalence of unhealthy lifestyles in the FBIH is quite high and it is necessary to conduct vigorous public health action to reduce risk factors, as well as individual access to high-risk individuals.

CONCLUSIONS

Social responsibility for health in the local community includes the creation of preventive health programs and proposed measures for improving and enhancing the health of the population. This is particularly important for rural areas, where the impacts of local communities can be significant. Active involvement of all actors in the social system and the coordination of all government sectors, from the health sector to the education sector, the inspectorate, finance and other sectors, as well as active cooperation with non-governmental sectors in the implementation of the current legislation, can all create a favorable environment for reducing these risk factors. Intersectoral cooperation is the main principle of the WHO European policy “Health 2020” and is reflected in the approach “Health in all policies” and is necessary to follow in strategic and operational approaches in the FBIH.

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