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ORIGINAL ARTICLE

Inequalities in the utilization of health care services in a transition European country: results from the national population health survey

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Abstract
Objectives To examine demographic, socio-economic, and health status inequalities in the utilization of health care services (UHCS) in the Republic of Srpska (RS), Bosnia and Herzegovina.
Methods Data were retrieved from the 2010 National Health Survey for the RS adult population ($n = 4128$). A complex sample design was taken into account for statistical analysis.
Results As compared to men, a higher percentage of women visited a family physician (FP), urgent care department, dentist and private doctor. Higher educated women and those worse-off (OR 1.17) more frequently visited FP. Hospitalization (OR 4.56 for males; OR 9.17 for females), visit to urgent care department (OR 3.19 for males; OR 2.42 for females) and visits to FP in females (OR 1.46) were associated with poor self-perceived health. No inequalities by wealth index were found for the utilization of FP, hospitalization, urgent care and dentist among persons with poor self-perceived health status.
Conclusions The present study confirmed demographic, socio-economic and health status inequalities in the UHCS in RS. These findings have significant implications for health policy makers that seek to provide equal care for all people living in RS.

Keywords Health service utilization · Family physician · Health survey · Inequalities in health · Republic of Srpska, Bosnia and Herzegovina

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Introduction

Health inequalities can be defined as differences in health status of individuals or population groups (Kawachi et al. 2002). While health inequality is a descriptive term that need not imply moral judgment, health inequity denotes an unjust or unfair difference in health (Kawachi et al. 2002; Arcaya et al. 2015) that could potentially be shaped by policies (Braveman 2006; Marmot et al. 2012).

The main generators of health inequalities are the various socio-economic determinants including education, income and employment (CSDH 2008). Access to health care services is also one of the determinants that contributes to inequalities in health (Starfield 2007; Whitehead and Dahlgren 2006) and is unevenly distributed around the

world. It varies across countries, groups, and individuals, largely influenced by socio-economic conditions (Hansen et al. 2012) as well as the health care systems in place (Walters and Suhrcke 2005; Balabanova et al. 2004).

The pattern of inequalities in the utilization of health services is pronounced in developing countries, but also present in developed countries (CSDH 2008). The evidence from most high-income countries shows a consistent pattern in the utilization of general practitioner (GP) services that is equally (Van Doorslaer et al. 2006) or pro-poor distributed (Hansen et al. 2012). In low- and middle-income countries, people who belong to disadvantaged groups were less likely to have visited a GP (Makinen et al. 2000; Janković et al. 2010).

In the Republic of Srpska (RS), one of the two constitutional and legal entities of Bosnia and Herzegovina, the health care system is complex and centralized. The health care services are provided by both the public and private sector at three levels—primary (health care centers and family medicine clinics), secondary (general hospitals) and tertiary level (special hospitals or clinical centers). The Health Insurance Fund of the RS provides obligatory health insurance and finances health care for the insured persons. Dental care is in private realm as well as private health care specialist services which are covered by out of pocket payments (Cain et al. 2002).

The last two decades have seen wide-ranging reforms in the health care system of RS. In recent years, the family medicine model has been the single largest reform implemented by the entity Government (MoH Ministry of Health and Social Welfare of the Republic of Srpska 2006). Family physicians (FP) in RS have similar educational and residency requirements like GP in other countries and offer almost the same medical services.

Since evidence on patterns of health care utilization in RS is sparse, the aim of this study was to analyze demographic, socio-economic and health status inequalities in the utilization of health care services in this country.

Methods

Study design and subjects

This cross-sectional study is a part of 2010 National Population Health Survey, which was carried out by the Ministry of Health and Social Welfare of the RS, with financial and professional support of the World Bank. The methodology of the survey data has been detailed elsewhere (Janković et al. 2014). In brief, a stratified two stage representative sample of the population of the RS was used. The first stage units were enumeration districts stratified by type of settlement (urban and rural) and five geographical regions. The second stage units were households. Of 1866 households randomly selected for the sample, 1779 were interviewed, with a response rate of 95.3%. In the interviewed households 4673 adults aged ≥18 were identified, of which for the purpose of this study 4128 were completely interviewed (1906 males, and 2222 females) with a response rate of 88.3%. The study was approved by the Ethics Committee of the Public Health Institute of RS. All respondents were informed about the purpose of the study and agreed to participate.

Information on demographic and socio-economic characteristics, self-perceived health, presence of chronic non-communicable diseases (NCD), health-related behaviors and utilization of health services was obtained by means of a questionnaire for adults, while information about household was obtained from the household questionnaire. A face-to-face interview took place in interviewees' homes from September to December 2010. The questionnaires were administered by well trained public health workers.

Study variables

Based on literature review, the following independent demographic variables were selected: age (categorized into following age groups: 18–24, 25–34, 35–44, 45–54, 55–64, 65+ years), gender, type of settlement (rural or urban), and marital status (married/living with a partner or living without a partner).

Educational level, employment status, and wealth index were used as measures of socio-economic status (SES). Education was categorized as low (no schooling, incomplete primary school and primary school), medium (three or four years of secondary education), and high (college and university education). Employment status was defined as employed, unemployed, and inactive (retired, housewives, students, people who are ill, unable to work).

The wealth index (also referred to as an asset index or standard of living index) is recommended to measure welfare in household surveys in low- and middle-income countries (Howe et al. 2012). Variables included in the wealth index were related to participants' assets (main material used for floor, roof, and walls of house, source of drinking and water supply, energy used for heating, number of bedrooms per household, possession of mobile phone, computer, and access to internet, refrigerator, color TV, dishwasher, washing machine, air conditioner, car, etc.). The calculation of wealth index for each respondent was described in detail elsewhere (Janković et al. 2010). According to the wealth index, respondents were classified into three wealth index groups (low, middle, and high).

Cigarette smoking and physical activity were used as health behavior variables. According to smoking status participants were classified as non-smokers, smokers, and

former smokers. Physical activity was categorized as poor (for those who exercised several times a year or did not exercise at all), average (for those who exercised less than four times a week, but at least 2–3 times a month), and good (for those who participated in physical activity four times or more a week for at least 30 min).

Height and weight were measured to the nearest 1 cm and 0.1 kg, respectively, with participants wearing light clothing and without shoes. The digital scales (SECA 877) and a portable stadiometer (SECA 206) were used. Scales were to be checked for the zero level every day before starting measurement and immediately afterwards. Also, it was recommended that the stadiometer be calibrated with calibration rods at the beginning of each stand, once every week, and at the end of each stand after all examinations. Validity and reliability studies to assess inter- and intra-interviewer accuracy and reproducibility were not performed.

Body mass index (BMI) was calculated as weight in kilograms divided by the square of height in meters. According to BMI, participants were classified into four groups: underweight ($\leq$18.5), normal weight (18.5–24.9), overweight (25.0–29.9), and obese ($\geq$30).

The training of interviewers (physicians and technicians) was conducted by external experts in interview techniques and anthropometric measurements. It consisted of three days of lectures and practical experience.

The variables selected to represent the need for health care services were self-perceived health status measured with a single question on an individual's perception of his or her own health (poor, average and good) and self-reported prevalence of noncommunicable diseases (NCD), such as cardiovascular diseases, malignant tumors, diabetes and rheumatic diseases. Two or more self-reported NCD at the same time were considered as multimorbidity.

The following five dependent variables were: visits to a FP, dentist, private doctor, urgent health care, and admissions to the hospital during the past 12 months. These variables were dichotomized (use and non use of health care service).

Statistical analysis

Due to well-known gender differences in health care utilization, all analyses were carried out separately for males and females. Categorical variables were described with frequencies and percentages and examined by gender using Chi square analysis. The prevalence of the utilization of health care services for both males and females with their 95% confidence intervals (CIs) were obtained adjusting for potential confounders and accounting for complex survey design. Statistical significance was estimated using ANOVA with posthoc Bonferroni's correction. Bivariate and multivariable logistic regression analyses (one model for each type of service) were performed to estimate the association between demographic, socio-economic, and health status variables with the utilization of health care services (visits to a FP, dentist, private doctor, urgent health care and hospitalization). All selected independent variables were included in the models. Since it is obvious that the effect of low socio-economic status on health is partly mediated by health-related behaviors we adjusted logistic regression analyses for smoking, physical activity, and BMI. To see whether inequalities by wealth exist in the utilization of health services in the case of health care need (using poor self-perceived health as a proxy measure of need) stratified analysis by wealth index was performed. All reported adjusted odds ratios (ORs) and their 95% CIs were weighted using probability sampling weights calculated to reflect the underlying population of the RS in 2010. The reported variance estimates and CIs account for the impact on precision of stratification and sampling weights using Taylor-series linearization techniques for complex samples. Statistical significance was set at 2-sided $P < 0.05$. All statistical analyses were performed using SPSS version 20.0 software (SPSS Inc., Chicago, IL, USA) and STATA version 11 (StataCorp LP, College Station, TX, USA) with the complex sampling design taken into account.

Results

The present study included 2222 (53.8%) women and 1906 (46.2%) men, in total 4128 adults aged $\geq$18 years. Their characteristics (for total sample and separately for males and females) were presented in Table 1. Most participants were in the oldest age group (23.8%), rural dwellers (58.5%), married or living with a partner (66.0%), and had middle education (49.6%). Out of all participants 23.8% were unemployed. Compared to men, women were older, less educated, more frequently economically, and physically inactive, obese, and lived without a partner. Also, women more frequently reported NCD including multimorbidity (two or more NCD), and poor health. Men were more frequently overweight and smokers. There were no gender differences in the type of settlement (urban or rural) and wealth index.

Table 2 shows the prevalence of health services utilization by sex. Compared to men higher percentage of women reported visits to FP, dentist, urgent care, and private doctor. There was no significant gender difference regarding hospitalization (Table 2).

The results of bivariate and multivariable logistic regression analyses of health services utilization were presented separately for males (Table 3) and females (Table 4).

Table 1 Characteristics of study population according to gender, Republic of Srpska, Bosnia and Herzegovina, 2010

Variable	Total		Males		Females		P^b
	No 4128[a]	% 100	No 1906[a]	% 46.2	No 2222[a]	% 53.8	
Age							
18–24	371	9.0	176	9.2	195	8.8	0.000
25–34	560	13.6	264	13.9	296	13.3	
35–44	645	15.6	317	16.6	328	14.8	
45–54	822	19.9	404	21.2	418	18.8	
55–64	748	18.1	340	17.8	408	18.4	
65+	982	23.8	405	21.2	577	26.0	
Type of settlement							
Urban	1712	41.5	778	40.8	934	42.0	0.301
Rural	2415	58.5	1127	59.2	1288	58.0	
Marital status							
Living without a partner	1400	34.0	582	30.6	818	36.9	0.000
Married/living with a partner	2716	66.0	1319	69.4	1397	63.1	
Education							
Low	1685	40.9	557	29.3	1128	50.8	0.000
Middle	2047	49.6	1123	59.0	924	41.6	
High	391	9.5	223	11.7	168	7.6	
Employment							
Inactive	1916	46.5	633	33.2	1283	57.8	0.000
Unemployed	982	23.8	526	27.6	456	20.5	
Employed	1226	29.7	746	39.2	480	21.6	
Wealth index groups							
Low	1652	40.0	747	39.2	905	40.7	0.149
Middle	823	19.9	374	19.6	449	20.2	
High	1653	40.1	785	41.2	868	39.1	
Smoking status							
Smoker	1253	30.5	706	37.2	547	24.7	0.000
Former smoker	593	14.4	393	20.7	200	9.0	
Non smoker	2266	55.1	798	42.1	1468	66.3	
Physical activity							
Good	1930	46.8	1056	55.4	874	39.3	0.000
Average	1660	40.2	665	34.9	995	44.8	
Poor	538	13.0	185	9.7	353	15.9	
Body mass index							
Underweight (≤18.5)	82	2.0	18	0.9	64	2.9	0.000
Normal weight (18.5–24.9)	1566	39.1	650	35.4	916	42.1	
Overweight (25–29.9)	1505	37.6	806	43.9	699	32.2	
Obese (≥30)	853	21.3	360	19.6	493	22.7	
NCD							
0	2414	58.5	1248	65.5	1166	52.5	0.000
1	1062	25.7	427	22.4	635	28.6	
≥2	652	15.8	231	12.1	421	18.9	

Table 1 continued

Variable	Total		Males		Females		P^b
	No 4128[a]	% 100	No 1906[a]	% 46.2	No 2222[a]	% 53.8	
Self-perceived health							
Good	2321	56.2	1196	62.7	1125	50.6	0.000
Average	1416	34.3	572	30.0	844	38.0	
Poor	391	9.5	138	7.2	253	11.4	

NCD noncommunicable diseases

[a] Missing values not included so totals are not 100% of total number in samples

[b] Chi-square test

Table 2 Prevalence (%) of health care utilization according to gender, Republic of Srpska, Bosnia and Herzegovina, 2010

Type of services	Males		Females		P^a
	Prevalence	95% CI	Prevalence	95% CI	
Family physician	50.7	49.2–52.1	56.5	55.2–57.9	0.000
Hospitalization	6.2	0.05–0.07	6.8	0.06–0.07	0.205
Urgent care	5.4	4.7–6.1	7.0	6.4–7.7	0.001
Dentist	18.6	17.5–19.8	22.7	21.7–23.8	0.000
Private doctor	12.6	11.5–13.7	18.7	17.7–19.7	0.000

[a] According to *F*-test (ANOVA) adjusted on age

Family physician

About half of all males (50.7%) and more than half of all females (56.5%) visited FP during the past 12 months. Younger men (OR 0.92), those employed (OR 1.19), economically inactive (OR 1.32), and those who perceived their health as average in comparison to good (OR 1.23) more frequently visited FP (Table 3). The same applies for women who belonged to low wealth index group (OR 1.17), and who self-perceived their health as poor or average (OR 1.46 and OR 1.48 respectively) (Table 4). Persons of both sexes who lived in urban settlements (OR 1.18 for males; OR 1.25 for females), and who reported a greater number of NCD (OR 1.75 for males; OR 1.57 for females) also reported more visits to FP, while single men compared to those married (OR 0.83), and lower educated women compared to high educated (OR 0.46 for low and OR 0.52 for middle educated) were less likely to report visit to FP (Tables 3 and 4).

Hospitalization

Women and men who perceived their health as poor were several times (approximately 4.5 times in men and nine times in women) more likely to report hospital admissions compared to those with good self-perceived health. Hospitalization was also associated with average self-perceived health (OR 2.88 for males; OR 2.84 for females) and with greater number of NCD (OR 1.51 for males; OR 1.32 for females) in both men and women (Tables 3 and 4). Younger women (OR 0.83), economically inactive (OR 1.72), and those better-off more frequently reported hospital admissions (Table 4).

Urgent care

The proportion of persons that visited urgent care services was higher among males who lived in urban area (OR 1.73), younger women (OR 0.83), and those women being married. Both males and females who perceived their health as poor (OR 3.19 and OR 2.42 respectively), males who perceived their health as average (OR 2.06), and respondents who reported greater number of NCD (OR 1.34 for males; OR 1.99 for females) more frequently visited urgent care department (Tables 3, 4).

Dentist

The utilization of dental service among the participants was poor. Only about one-fifth of the study population (18.6% males and 22.7% females) visited a dentist at least once during the last year (Table 2). Multivariable analysis showed that younger respondents (OR 0.71 for males; OR 0.72 for females), urban dwellers (OR 1.36 for males; OR 1.38 for females), and those with a greater number of NCD (OR 1.31 for males; OR 1.17 for females), as well as

Table 3 Associations of health care utilization with demographic, socio-economic, and health status variables in males, Republic of Srpska, Bosnia and Herzegovina, 2010

Variable	Family physician	Hospitalization	Urgent care	Dentist	Private doctor
Age					
Years					
B	1.01 (1.01–1.02)**	1.03 (1.03–1.04)**	1.02 (1.01–1.02)**	0.97 (0.97–0.98)**	0.99 (0.99–1.00)
M	0.92 (0.87–0.98)**	1.04 (0.89–1.20)	1.00 (0.87–1.15)	0.71 (0.66–0.77)**	0.89 (0.81–0.97)*
Type of settlement					
Urban					
B	1.22 (1.07–1.38)**	1.01 (0.78–1.32)	1.73 (1.32–2.26)**	1.70 (1.45–1.99)**	1.76 (1.46–2.11)**
M	1.18 (1.02–1.37)*	1.13 (0.82–1.54)	1.86 (1.36–2.55)**	1.36 (1.14–1.64)**	1.31 (1.06–1.62)*
Rural	1	1	1	1	1
Marital status					
Single					
B	0.73 (0.64–0.83)**	0.69 (0.51–0.94)*	0.74 (0.54–1.02)	1.29 (1.09–1.52)**	1.00 (0.82–1.22)
M	0.83 (0.71–0.97)*	0.99 (0.71–1.40)	1.02 (0.72–1.45)	0.95 (0.77–1.17)	1.13 (0.89–1.42)
Married	1	1	1	1	1
Education					
Low					
B	0.81 (0.66–1.00)	1.06 (0.71–1.58)	0.91 (0.58–1.40)	0.28 (0.22–0.36)**	0.41 (0.31–0.54)**
M	1.03 (0.80–1.32)	0.82 (0.51–1.32)	1.12 (0.67–1.90)	0.51 (0.38–0.68)**	0.79 (0.57–1.11)
Middle					
B	0.69 (0.57–0.84)**	0.62 (0.42–0.92)*	0.83 (0.55–1.25)	0.54 (0.43–0.67)**	0.52 (0.40–0.66)**
M	0.90 (0.73–1.12)	0.75 (0.49–1.15)	1.07 (0.68–1.69)	0.60 (0.47–0.76)**	0.64 (0.49–0.84)**
High	1	1	1	1	1
Employment status					
Employed					
B	1.27 (1.10–1.48)**	0.86 (0.60–1.24)	1.27 (0.88–1.84)	1.52 (1.26–1.85)**	1.44 (1.15–1.80)**
M	1.19 (1.01–1.41)*	0.95 (0.64–1.41)	1.31 (0.88–1.96)	1.22 (0.99–1.52)	1.14 (0.89–1.46)
Inactive					
B	1.99 (1.70–2.34)**	2.10 (1.51–2.91)**	1.97 (1.37–2.82)**	1.07 (0.86–1.32)	1.10 (0.86–1.41)
M	1. 32 (1.09–1.60)**	0.81 (0.54–1.21)	1.35 (0.88–2.09)	1.44 (1.11–1.86)**	0.85 (0.63–1.14)
Unemployed	1	1	1	1	1
Wealth index groups					
Low					
B	1.06 (0.92–1.21)	1.43 (1.08–1.90)*	0.99 (0.73–1.34)	0.55 (0.46–0.65)**	0.44 (0.35–0.54)**
M	1.08 (0.92–1.27)	1.10 (0.79–1.53)	1. 08 (0.76–1.54)	0.86 (0.69–1.06)	0.52 (0.41–0.67)**
Middle					
B	0.97 (0.83–1.15)	0.83 (0.56–1.23)	1.24 (0.87–1.76)	0.80 (0.65–0.98)*	0.63 (0.49–0.81)**
M	0.99 (0.83–1.18)	0.69 (0.45–1.05)	1.20 (0.82–1.76)	1.04 (0.83–1.30)	0.73 (0.56–0.95)*
High	1	1	1	1	1
NCD					
Number					
B	1.99 (1.82–2.18)**	2.44 (2.09–2.85)**	1.68 (1.43–1.98)**	0.92 (0.83–1.03)	1.26 (1.12–1.42)**
M	1.75 (1.56–1.97)**	1.51 (1.24–1.85)**	1.34 (1.07–1.67)**	1.31 (1.13–1.53)**	1.54 (1.31–1.81)**
Self-perceived health					
Poor					
B	2.44 (1.90–3.13)**	8.68 (5.88–12.82)**	3.11 (2.05–4.72)**	0.52 (0.36–0.74)**	1.01 (0.71–1.44)
M	1.34 (0.97–1.86)	4.56 (2.69–7.76)**	3.19 (1.79–5.68)**	0.67 (0.42–1.05)	0.83 (0.52–1.32)

Table 3 continued

Variable	Family physician	Hospitalization	Urgent care	Dentist	Private doctor
Average					
B	1.80 (1.57–2.05)**	4.61 (3.38–6.29)**	2.06 (1.54–2.76)**	0.60 (0.50–0.72)**	0.94 (0.77–1.14)
M	1.23 (1.04–1.46)*	2.88 (1.97–4.20)**	2.06 (1.42–2.98)**	0.76 (0.60–0.96)*	0.82 (0.63–1.06)
Good	1	1	1	1	1

B bivariate logistic regression, *M* multivariable logistic regression, *NCD* noncommunicable diseases, 1, reference category. Values are odds ratios (95% CI) adjusted for smoking, physical activity, body mass index, and all other variables in the table

*$P < 0.05$, **$P < 0.001$

Table 4 Associations of health care utilization with demographic, socio–economic, and health status variables in females, Republic of Srpska, Bosnia and Herzegovina, 2010

Variable	Family physician	Hospitalization	Urgent care	Dentist	Private doctor
Age					
Years					
B	1.01 (1.01–1.02)**	1.02 (1.01–1.03)**	1.01 (1.00–1.01)**	0.96 (0.96–0.97)**	0.98 (0.98-0.98)**
M	0.95 (0.90–1.00)	0.82 (0.73–0.92)**	0.83 (0.74–0.93)**	0.72 (0.67–0.77)**	0.80 (0.75–0.86)**
Type of settlement					
Urban					
B	1.26 (1.12–1.41)**	0.98 (0.78–1.23)	1.10 (0.88–1.38)	1.68 (1.47–1.92)**	1.49 (1.29–1.72)**
M	1.25 (1.09–1.43)**	0.98 (0.76–1.28)	1.14 (0.89–1.47)	1.38 (1.18–1.62)**	1.09 (0.93–1.30)
Rural	1	1	1	1	1
Marital status					
Single					
B	1.17 (1.04–1.32)**	1.04 (0.83–1.31)	0.82 (0.65–1.03)	0.96 (0.84–1.10)	0.84 (0.73–0.98)*
M	1.06 (0.93–1.20)	0.82 (0.64–1.05)	0.76 (0.59–0.98)*	0.92 (0.78–1.08)	0.77 (0.65–0.91)**
Married	1	1	1	1	1
Education					
Low					
B	0.64 (0.51–0.81)**	1.77 (1.07–2.92)*	1.58 (0.96–2.59)	0.13 (0.10–0.17)**	0.21 (0.17–0.27)**
M	0.46 (0.35–0.62)**	0.83 (0.46–1.52)	0.99 (0.54–1.81)	0.22 (0.17–0.30)**	0.34 (0.25–0.46)**
Middle					
B	0.49 (0.39–0.62)**	1.27 (0.76–2.12)	1.41 (0.85–2.34)	0.40 (0.32–0.51)**	0.40 (0.31-0.50)**
M	0.52 (0.40-0.67)**	1.12 (0.65-1.94)	1.30 (0.75-2.26)	0.40 (0.31-0.51)**	0.47 (0.36-0.60)**
High	1	1	1	1	1
Employment status					
Employed					
B	1.06 (0.89-1.26)	0.94 (0.62-1.43)	0.75 (0.52-1.07)	1.40 (1.16-1.68)**	1.84 (1.50-2.26)**
M	0.91 (0.75-1.10)	1.05 (0.66-1.65)	0.74 (0.50-1.10)	1.01 (0.82-1.25)	1.35 (1.07-1.69)*
Inactive					
B	1.24 (1.08-1.43)**	2.18 (1.58-3.00)**	1.22 (0.92-1.61)	0.54 (0.46-0.64)**	0.84 (0.70-1.02)
M	0.89 (0.75-1.05)	1.72 (1.17-2.51)**	0.95 (0.69-1.32)	0.99 (0.82-1.22)	1.13 (0.90-1.41)
Unemployed	1	1	1	1	1
Wealth index groups					
Low					
B	1.17 (1.03-1.32)*	0.80 (0.63-1.02)	1.15 (0.90-1.47)	0.49– (0.42–0.57)**	0.40 (0.34–0.48)**
M	1.17 (1.02–1.37)*	0.50 (0.38–0.68)**	0.99 (0.75–1.31)	0.98 (0.81–1.18)	0.55 (0.45–0.67)**

Table 4 continued

Variable	Family physician	Hospitalization	Urgent care	Dentist	Private doctor
Middle					
B	1.04 (0.90–1.22)	0.72 (0.53–0.98)*	1.05 (0.77–1.42)	0.64 (0.54–0.77)**	0.52 (0.43–0.64)**
M	1.09 (0.92–1.28)	0.51 (0.37–0.72)**	0.93 (0.67–1.28)	0.88 (0.72–1.08)	0.64 (0.52–0.79)**
High	1	1	1	1	1
NCD					
Number					
B	1.63 (1.51–1.76)**	1.91 (1.67–2.18)**	1.72 (1.51–1.96)**	0.63 (0.57–0.69)**	0.97 (0.89–1.07)
M	1.57 (1.41–1.75)**	1.32 (1.08–1.61)**	1.99 (1.62–2.43)**	1.17 (1.02–1.35)*	1.52 (1.32–1.75)**
Self-perceived health					
Poor					
B	2.35 (1.93–2.85)**	9.43 (6.97–12.76)**	3.50 (2.61–4.70)**	0.37 (0.29–0.48)**	0.86 (0.68–1.08)
M	1.46 (1.12–1.89)**	9.17 (5.78–14.56)**	2.42 (1.54–3.80)**	1.07 (0.76–1.51)	1.20 (0.86–1.67)
Average					
B	1.87 (1.65–2.11)**	2.58 (1.93–3.43)**	1.58 (1.23–2.03)**	0.45 (0.38–0.52)**	0.66 (0.56–0.77)**
M	1.48 (1.26–1.74)**	2.84 (1.96–4.09)**	1.35 (0.97–1.88)	0.92 (0.75–1.12)	0.86 (0.70–1.06)
Good	1	1	1	1	1

B bivariate logistic regression, *M* multivariable logistic regression, *NCD* noncommunicable diseases, 1, reference category. Values are odds ratios (95% CI) adjusted for smoking, physical activity, body mass index and all other variables in the table

*$P < 0.05$, **$P < 0.001$

economically inactive men in comparison to unemployed (OR 1.44) were more likely to have visited a dentist. Low and middle educated persons in comparison to high educated had lower odds (49% and 40% for males; 78% and 60% for females) to visit a dentist. Men who perceived their health as average in comparison to good (OR 0.76) were less likely to have visited a dentist (Tables 3, 4).

Private doctor

Only a small proportion of users (12.6% males and 18.7% females) visited a private doctor in the last year (Table 2). Younger respondents of both sexes (OR 0.89 for males; OR 0.80 for females), those better-off, who reported a greater number of NCD (OR 1.54 for males; OR 1.52 for females), as well as males who lived in urban area (OR 1.31), married and employed females were more likely to have visited a private doctor in 12 months before the survey. Middle educated men (OR 0.64) and low and middle educated women (OR 0.34 and OR 0.47) in comparison to those high educated less frequently visited private doctor (Tables 3, 4).

Stratification by self-perceived health

To see whether inequalities by wealth index, as an important element of SES, exist in the utilization of health services in the case of health care need (using poor self-perceived health as a proxy measure of need), we stratified analysis by wealth index and gender (Table 5). No inequalities by wealth were observed for the utilization of FP, hospitalization, urgent care, and dentist among persons with poor self-perceived health, i.e. those in most need. However, both males and females with poor self-perceived health who belonged to low wealth index group compared to their counterparts from high wealth index group (OR 0.45 for males; OR 0.52 for females) were less likely to have visited private doctor in the last twelve months (Table 5).

Discussion

In the present study, we investigated the association between demographic, socio-economic, and health status factors, and the utilization of health services in RS.

Our results showed significant inequalities in health care service utilization by sex. The percentage of women using health care services was significantly higher than that of men in terms of visits to FP, dentist, urgent care services, and private doctor and could be explained by the fact that women had a worse perception of health status and reported higher NCD rates than men. Our results are in accordance with previous studies investigated utilization rates of GP services (Bertakis et al. 2000; Ladwig et al. 2000; Parslow et al. 2004; Redondo-Sendino et al. 2006; Jatrana and Crampton 2009; Janković et al. 2010), dental services (Mumcu et al. 2004; Bahramian et al. 2015) and

Table 5 Utilization of health services by wealth index and poor self-perceived health among males and females, Republic of Srpska, Bosnia and Herzegovina, 2010

Health service	Wealth index groups	Poor self-perceived health	
		Males	Females
Family physician	Low	1.09 (0.59–1.99)	1.45 (0.90–2.34)
	Middle	1.06 (0.50–2.25)	1.16 (0.66–2.04)
	High	1	1
Hospitalization	Low	1.04 (0.47–2.34)	0.60 (0.37–1.01)
	Middle	1.18 (0.45–3.08)	0.75 (0.41–1.36)
	High	1	1
Urgent Care	Low	1.09 (0.41–2.90)	0.72 (0.40–1.31)
	Middle	1.32 (0.40–4.30)	0.77 (0.38–1.58)
	High	1	1
Dentist	Low	1.95 (0.77–4.99)	1.15 (0.60–2.20)
	Middle	1.34 (0.45–4.05)	1.03 (0.47–2.24)
	High	1	1
Private doctor	Low	0.45 (0.21–0.99)*	0.52 (0.30–0.91)*
	Middle	0.39 (0.13–1.23)	0.81 (0.44–1.50)
	High	1	1

1, reference category. Values are odds ratios (95% CI) adjusted for age, type of settlement, marital status, employment status, and education

*$P < 0.05$

private doctors services (Pappa and Niakas 2006). Contrary to our study, Greek (Pappa and Niakas 2006) and American researchers (Fan et al. 2011) did not find any statistically significant gender difference for emergency department visits.

No association between gender and hospitalization was found in our study, that is in accordance with previous studies (Janković et al. 2010; Borrell et al. 2001; Redondo-Sendino et al. 2006; Bertakis et al. 2000).

Our multivariable adjusted analyses failed to detect a positive association between age and greater use of primary health resources as found by others (Pappa and Niakas 2006; Janković et al. 2010). However, an inverse relationship between age and use of private doctor services and dentist (in both sexes) was found and could be explained by the fact that younger people often use these services for preventive purposes.

A significant body of research shows that SES influences utilization of health services. However the evidence for socio-economic inequalities in utilization of various health services is contradictory. While some studies report that people with lower SES confront obstacles in accessing health care services (Garrido-Cumbrera et al. 2010; Habicht et al. 2009), several studies show that the utilization of GP and hospital services is pro-poor (Filc et al. 2014; Borrell et al. 2000; Moorin and Homan 2006; Allin et al. 2009).

The results of our study showed significant socio-economic inequalities in health services' utilization.

Higher educated women in RS were more likely to have visited a FP in the last year. Stirbu et al. (2011) investigated educational inequalities in utilization of GP in 9 European countries (6 Western and 3 Eastern European countries) and found that utilization of GP services was fairly equally distributed between educational groups in most countries (except Belgium and Germany). In the present study, dental service utilization was influenced by education—participants with low and middle education in comparison to those with high education had less visits, that is consistent with other studies (Bahramian et al. 2015; Janković et al. 2010; Pavi et al. 2010; Christian et al. 2013). The same pattern of educational inequalities in the utilization of private doctor service in our study was found only for women, while other authors found that more educated respondents of both sexes were more likely to have visited a private doctor (Pappa and Niakas 2006; Janković et al. 2010). Relation between level of education and health care utilization could be explained by the fact that education shapes future occupational opportunities and earning potential and provides knowledge and life skills that allow better educated persons to gain more ready access to information and resources to promote health (Ross and Wu 1995) and more proactive approach in seeking health care.

We found statistically significant inverse association between wealth index and utilization of FP only for women in the low wealth index group compared to those in the high group. While worse-off women more frequently reported visits to FP, wealthy women were more likely to use private health services. However, we did not have any

explanation for different effect of wealth on FP utilization for men and women. In a study conducted in 21 developed countries, utilization of GP services was distributed fairly equally, independent of income (Van Doorslaer et al. 2006). Regidor et al. (2008) who investigated socio-economic patterns in the use of public and private health services in Spain showed inequality in GP visits and hospital admissions, favoring the lower socio-economic groups. Mentioned inequalities could be due to the fact that persons in high socio-economic positions choose to use private health services.

Our expectation that wealth index as a proxy for income affects utilization of private doctors and dentist services that involves out of pocket payment, was confirmed only for private doctors in both sexes. Better-off people more frequently visited private doctor that is in accordance with findings of Italian (Piperno and Di Orio 1990) and Greek studies (Pappa and Niakas 2006), where people with higher income levels were more likely to use private health services.

We found that hospital utilization was significantly influenced by wealth index (a positive association was observed) only in females if medical need was not considered, that is in accordance with Serbian study (Janković et al. 2010).

Since previous studies have suggested health status as a strong predictor of health service utilization (Borrell et al. 2001; George et al. 2012; Janković et al. 2010) we considered self-perceived health and self-reported NCD as measures of need. In the present study, poor self-perceived health was associated with utilization of FP only in females, while both men and women who perceived their health as poor were more likely to visit urgent care department and had more hospital admissions than their counterparts with good health. In addition, visits to urgent care department did not differ between women with good and average self-rated health. Pappa and Niakas (2006) showed that self-perceived health status was the most important factor of the utilization of private physician services, urgent care departments and hospital admissions in Greece. Similar findings were observed in several other studies (Parslow et al. 2004; Morris et al. 2005; Janković et al. 2010).

It is well-known that NCD morbidity, especially multimorbidity, is associated with increased health care utilization (van Oostrom et al. 2014). In the present study, we found that people with a greater number of NCD more frequently visited FP, dentist, urgent care, private doctor, and had more hospital admissions in the last year that is in accordance with previous studies (van Oostrom et al. 2014; Salisbury et al. 2011). With the expected rise in multimorbidity in the coming years, health systems should be prepared for the future increase in utilization of health services.

Our study confirmed that no inequalities by wealth exist for the utilization of analyzed health services (except for private doctor service) among persons with poor self-perceived health status, i.e. those in most need. Our results are in accordance with a Spanish (Catalonian) study for non preventive health care services, such as visits to health professionals and hospitalization (Borrel et al. Borrell et al. 2001), Greek study for visits to urgent care departments and admissions to the hospitals (Pappa and Niakas 2006) and Serbian study for hospital admissions (Janković et al. 2010).

To the best of our knowledge, this is the first study concerning inequalities in health care utilization in the RS. Its major strength is that our findings are based on a large, nationally representative sample.

However, there are several limitations. First, the cross-sectional study design limits causal interpretation of our findings. Second, our data on health care utilization are self-reported and could be a potential source of bias, but other authors have confirmed the high reliability and validity of self-reports of health care use (Roberts et al. 1996). Third, although we have adjusted for many confounding variables, it is possible that the differences we found in the utilization of health care services could be the result of other factors associated with services that we did not measure.

Nevertheless, the present study yields intriguing results. We confirmed important demographic and socio-economic inequalities in the utilization of health care services in RS which may contribute to sustaining inequalities in health outcomes. We also examined the role of need factors in the use of health services and found that no inequalities by wealth exist for the utilization of analyzed health care services (except private doctor service) among those in most need. However, future longitudinal studies are needed to capture causal relations between various factors and health services utilization in RS. Our findings might have important implications for health policy makers that seek to provide equal care for all people living in RS.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical

standards. The study was approved by the Ethics Committee of the Public Health Institute of RS.

Informed consent Informed consent was obtained from all individual participants included in the study.

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