



## Smoking habits, knowledge about and attitudes toward smoking among employees in health institutions in Serbia

Pušačke navike, znanje i stavovi o pušenju zaposlenih u zdravstvenim institucijama u Srbiji

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### Abstract

**Background/Aim.** According to the number of active smokers, Serbia occupies a high position in Europe, as well as worldwide. More than 47% of adults are smokers according to WHO data, and 33.6% according to the National Health Survey Serbia in 2006. Smoking physicians are setting a bad example to patients, they are uncritical to this habit, rarely ask patients whether they smoke and rarely advise them not to smoke. These facts contribute to the battle for reducing the number of medical workers who smoke, as well as the number of smokers among general population. The aim of the study was to determine the smoking behavior, knowledge and attitudes and cessation advice given to patients by healthcare professionals in Serbia. **Methods.** A stratified random cluster sample of 1,383 participants included all types of health institutions in Serbia excluding Kosovo. The self-administered questionnaire was used to collect data about smoking habits, knowledge, attitudes and cessation advice to patients given by health professionals in Serbia. **Results.** Out of 1,383 participants, 45.60% were smokers, of

whom 34.13% were physicians and 51.87% nurses. There were 46.4% male and 45.4% female smokers. The differences in agreement with the statements related to the responsibilities of health care professionals and smoking policy are significant between the “ever” and “never” smokers, and also between physicians and nurses. Twenty-five percent of nurses and 22% of doctors claimed they had received formal training. However, only 35.7% of the healthcare professionals felt very prepared to counsel patients, while 52.7% felt somewhat prepared and 11.6% were not prepared at all. **Conclusions.** According to the result of this survey, there are needs for more aggressive nationwide non-smoking campaigns for physicians and medical students. Experiences from countries where physicians smoke less and more effectively carry out smoking cessation practices need to be shared with Serbian physicians in order to improve their smoking behavior and smoking cessation practices.

**Key words:** smoking; health personnel; serbia; habits; preventive health services; smoking cessation.

### Apstrakt

**Uvod/Cilj.** Prema broju pušača Srbija se visoko rangira u evropskim i svetskim razmerama. Prema podacima Svetske zdravstvene organizacije (SZO) puši 47% stanovništva Srbije, a prema istraživanju zdravlja stanovnika Srbije iz 2006. godine 33,6%. Lekari koju puše daju loš primer drugima, nekritični su prema toj navici i ređe savetuju pacijente u vezi pušenja. Smanjenjem prevalencije među lekarima indirektno utičemo na smanjenje prevalencije u opštoj populaciji. Cilj studije bio je da se definišu pušačke navike, znanja i stavovi o pušenju zdravstvenih radnika u

Srbiji. **Metode.** Primenjen je stratifikovani *cluster* uzorak od 1 383 ispitanika na teritoriji Srbije bez Kosova i podaci su dobijeni popunjavanjem upitnika u zdravstvenim ustanovama svih nivoa. **Rezultati.** Od 1 383 ispitanika, pušača je bilo 45,6%. Najmanje ih je bilo među lekarima (34,13%), a najviše među medicinskim sestrama (51,87%). Pušilo je 46,4% muških i 45,4% ženskih ispitanika. Ustanovljena su značajna neslaganja u stavovima o ulozi zdravstvenih radnika u odvikavanju od pušenja kako između nepušača i pušača, tako i između lekara i sestara. Dobro pripremljenih ispitanika za savetovanje pacijenata o pušenju bilo je 35,7%, delimično pripremljenih 52,7% a

potpuno nepripremljenih 11,6%. **Zaključak.** Kao rezultat studije nameće se potreba za antipušačkom kampanjom na nacionalnom nivou kako kod lekara, tako i kod studenata medicine. Potrebno je primeniti modele iz zemalja u kojima je prevalencija pušača među doktorima niska, sa krajnjim ciljem da se snizi prevalencija pušača među

zdravstvenim radnicima u Srbiji, kao i da se unapredi njihovo znanje i stavovi o pušenju.

**Ključne reči:**  
pušenje; zdravstveno osoblje; srbija; navike; preventivno-medicinska zaštita; pušenje, prestanak.

## Introduction

Smoking, the most popular and widespread risk factor represents oral inhalation of certain substances, most often tobacco, which releases various materials through burning. The most commonly released material is nicotine, which, in the form of smoke, becomes susceptible for absorption through the lungs.

Throughout centuries, the reputation of smoking had changed from complete discrimination to full affirmation. Fortunately, the "modern world" has perceived smoking as negative and harmful. Therefore, it is classified as a disease in the International Classification of Diseases by the World Health Organization [WHO (ICD-10)], and Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) published by the American Psychiatric Association.

According to the number of active smokers, Serbia occupies top positions in Europe, as well as worldwide. Considering the data from the WHO, there are 47% of adult smokers in Serbia.

The final report from National Health Survey Serbia in 2006 shows that 33.6% of population were smokers, with 38.1% male and 29.9% females. Compared to the year 2000, the frequency of smokers has decreased by 6.9%<sup>1</sup>.

Although the harmfulness of tobacco is well-known, healthcare professionals do not always represent good examples<sup>2</sup>. Moreover, during the 20th century physicians even used to advertise cigarettes<sup>3,4</sup>. The prevalence among them was extremely high. Some of the earliest researches show that in the USA 40% of smokers were physicians in 1959<sup>5</sup>. In the mid-70's this prevalence decreased to 21%<sup>6,7</sup>, while in the '80s it was around 17% including those who smoked pipes or cigars<sup>8</sup>. Between 1987 and 1994, there was a dramatic decrease in the number of smokers with the 10% prevalence<sup>9-12</sup>. Similar trends were registered in the Scandinavian countries during the final 25 years of the 20th century<sup>13-15</sup>.

Since 1999, the WHO has taken a stand that a healthcare professional, as one of the most highly esteemed social structure whose model of behavior is respected, should represent a model of healthy life without smoking and should advise their patients on the harmfulness of smoking and smoking cessation. Ever since, special attention has been paid to the analysis and smoking habits of physicians who represent crucial factors in the reduction of the smoking epidemic<sup>16</sup>.

Healthcare professionals play the most important role in the creation of health policy of a country, as well as in anti-smoking campaigns and strategies, and they are the strongest factor in smoking cessation.

A smoking physician sets a bad example to patients; does not have a critical attitude towards this habit, rarely asks patients whether they smoke and rarely advises them not to smoke. This fact is in favor of the battle for reducing the number of healthcare professionals who smoke, thereby decreasing the prevalence in general population<sup>17-21</sup>.

The aim of the study was to determine smoking behavior, knowledge and attitudes and cessation advice to patients among health professionals in Serbia.

## Methods

This study was organized as an epidemiological multicentric cross-sectional study that included data on smoking habits, knowledge and attitudes of healthcare professionals in Serbia.

The original self administered questionnaire consists of 48 questions. The first section of the questionnaire included basic demographic characteristics and basic smoking habits of examinees. This part contained 18 questions about the number of smoked cigarettes, starting and cessation of smoking and willingness to quit smoking. The second part included 17 questions about the knowledge and attitudes to smoking, its harmfulness and the role of healthcare professionals in providing advice and help in smoking cessation. The last part contained 13 questions related to trainings, which were available to the examinees and their preparedness to advise patients to quit smoking.

In the present study, smoking is defined as smoking cigarettes. Respondents were classified as current smokers, ex-smokers, occasional or never smokers. Current smokers are those who currently smoke every day at least one cigarette or seven cigarettes per week. The respondents who admit to smoke but not every day, or who smoke fewer than seven cigarettes a week are defined as occasional smokers. Ex-smokers are current non-smokers who used to smoke habitually for 6 months or more. Newer smokers are defined as ones who have never smoked cigarettes at all.

According to profession, they were classified into physicians (teaching physicians and physicians), nurses and staff (technical staff, administrative staff and other professionals).

The research was performed during May and June 2010 on the representative sample of all healthcare institutions in Serbia, excluding Kosovo. A stratified random cluster sample included 4 types of health institutions (primary health centers, clinical centers, clinical-hospital centers, general hospitals and institute for public health). The research was also performed at the Military Hospital in Niš and the Military Medical Academy in Belgrade.

The primary sampling units, or clusters, were departments in health care institutions. A random sampling technique was then used on any relevant clusters to choose which clusters to include in the study. The list of all clusters was stratified by occupation. From each cluster, a sample of study groups was randomly selected.

We distributed 1,773 questionnaires, while 1,383 participants completed it with 78% response rate overall. Four questionnaire samples were not included in the analysis due to the lack of information, so that 1,383 questionnaires were used for further analysis.

We used parametric and non-parametric tests (*t*-test, Man-Whitney U test,  $\chi^2$  test, Fisher test and ANOVA) to assess the relationships between variables. The collected data were presented in tables with absolute and relative numbers. For the purpose of some analysis, the respondents were divided into "ever" and "never" smokers, based on their current, past, or non-smoking history, occupation, and age range was determined by the mean age and standard deviation. Any statistical analyses were performed using SPSS (Version 18), and two-tailed  $p < 0.05$  was considered statistically significant in all the analyses.

**Results**

The survey included 1,383 participants (501 physicians, 732 nurses and 150 other staff). The mean age was 40.29 years with the standard deviation of 9.18. The majority of participants were female (1,026), mean age  $39.57 \pm 9.07$ , whereas there were 357 male examinees with the mean age of  $42.33 \pm 9.17$ .

The prevalence of smokers in our sample was 45.63%, current smokers 34.63% and occasional smokers 11%. There were 18.3% of ex-smokers while the percentage of those who had never smoked was 36.08%.

The highest number of smokers (53.34%), was among the staff (current smokers 48.67% and occasional smokers 4.67%) and nurses 51.78% (current smokers 39.48% and occasional smokers 12.3%). The lowest prevalence of smoking was among physicians (34.13%) (teaching physicians 46.84% and physicians 32.9).

Among the participants, the number of female smokers was 45.41% (34.11% current and 11.30% occasional smokers), whereas there were 46.39% male smokers (36.31% current and 10.08% occasional smokers).

The highest number of smokers, 105 (47.95%), was in the 50–59 age group (Table 1).

From the total number of smokers, 21.2% smoke in front of their patients.

Table 2 shows the characteristics of participants who smoke (starting of smoking and daily number of smoked cigarettes). It can be concluded that the starting of smoking is significantly different among various professions (ANOVA:  $F = 5.101, p = 0.002$ ).

The latest to start smoking were physicians (20.4 years of age) and teaching physicians (20.5 years of age). This is statistically later than nurses who started smoking at 18.9 years of age on average and non-medical staff who started at 18.4 years of age.

Comparing the number of smoked cigarettes with the type of occupation, it can be observed that there is a statisti-

**Demographic data and smoking rates**

**Table 1**

Characteristics of participants	Current smokers	Ex-smokers	Occasional smokers	Never smoked	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
All responders					
sex	479 (34.63)	253 (18.30)	152 (11.00)	499 (36.08)	1383 (100)
female	350 (34.11)	170 (16.57)	116 (11.30)	390 (38.02)	1026 (74.2)
male	129 (36.31)	83 (23.25)	36 (10.08)	109 (30.54)	357 (25.8)
Occupation					
teaching physicians	17 (35.42)	11 (22.91)	5 (11.42)	15 (31.25)	48 (3.40)
physicians	100 (22.08)	98 (21.63)	49 (10.82)	206 (45.47)	453 (32.70)
nurses	289 (39.48)	110 (15.02)	90 (12.30)	243 (33.20)	732 (52.80)
staff	73 (48.67)	36 (24.0)	7 (4.67)	34 (22.66)	150 (11.10)
Age (years)					
< 30	69 (34.33)	17 (8.46)	29 (14.42)	86 (42.79)	201 (14.53)
30–39	141 (32.87)	79 (18.41)	51 (11.89)	158 (36.83)	429 (31.02)
40–49	176 (34.04)	106 (20.50)	56 (10.84)	179 (34.62)	517 (37.38)
50–59	92 (42.01)	42 (19.18)	13 (5.94)	72 (32.87)	219 (15.84)
60+	1 (5.88)	9 (52.94)	3 (17.64)	4 (23.54)	17 (1.23)

**Characteristics of the participants who smoke (ANOVA test)**

**Table 2**

Characteristics	Teaching physicians		Physicians		Nurses		Staff		Significance
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
Starting of smoking (years)	20.47	4.48	20.38	5.38	18.91	3.75	18.44	4.06	A/B/C
Number of cigarets/day	22.55	5.16	17.54	6.29	16.24	7.14	19.73	6.05	C/D/E

A – physicians vs nurse; B – physicians vs staff; C – teaching physicians vs nurse; D – teaching physicians vs staff; E – nurse vs staff.

cally significant difference among the analyzed groups (ANOVA:  $F = 4.213$ ,  $p < 0.006$ ).

The physicians teaching at medical schools had the highest number of smoked cigarettes, 22.5 a day. This number was significantly high when compared to the physicians (17.5 cigarettes a day), nurses (16.2) as well as other employees in medical institutions (19.7 cigarettes a day).

The data showed that other non-medical staff smoked significantly higher number of cigarettes compared to nurses.

The highest number of smokers (46.5%), smoked out of habit, and slightly less (37.6%) felt pleasure during smoking and cited that as a reason. The lowest number of participants (4.3%) smoked because they were dissatisfied and 11.5% of them listed stress as a reason.

Table 3 presents the results of the percentage agreement with knowledge and attitude statements in the questionnaire compared by smoking status. The highest number of participants, 250 (53.8%), who asked their patients if they were smokers were in the group of those who never smoke which is significantly more compared to those who were smokers 34.2% ( $\chi^2 = 13.82$ ;  $p < 0.001$ ).

( $\chi^2 = 18.46$ ;  $p < 0.001$  and  $\chi^2 = 5.46$ ;  $p = 0.02$ ). Out of the total number of those who quit smoking, 32 (13.6%) inquired about the smoking status of their patients.

The greatest interest in exposure of patients to cigarette smoke was observed among the participants who had never smoked, namely 158 (34.5%). A statistical significance was considerably higher compared to the smokers (16%); ( $\chi^2 = 39.50$ ;  $p < 0.001$ ). Also, the exposure to cigarette smoke was more often monitored by those who had quit (20.3% at the level of  $\chi^2 = 13.93$ ;  $p < 0.001$ ) as well as by occasional smokers (26.7% at the level of  $\chi^2 = 7.80$ ;  $p = 0.005$ ).

Table 4 represents the results of the questionnaire considering the percentage agreement with knowledge and attitude statements compared by the occupation and by smoking status. All the participants stated that smoking is harmful to health and, in general, all the participants had "appropriate" attitudes considering smoking. However, there were some significant differences between occupation and smoking status regarding the role of healthcare professionals in providing advice to patients.

The participants who smoke did not completely agree that medical workers are role models for patients and em-

**Table 3**  
**Knowledge and attitudes of healthcare professionals in Serbia according to their smoking status**

Questions the patients?	Smoking status	Yes		No		Sometimes		<i>p</i> (vs smokers)	
		n	%	n	%	n	%		
Do you ask your patients if they smoke	never	465	250	53.8	96	20.6	119	25.6	< 0.001
	quit	239	98	41.0	63	26.4	78	32.6	
	occasional smokers	147	70	47.6	22	15.0	55	37.4	< 0.001
Do you advise patients to quit smoking	never	463	280	60.5	79	17.1	104	22.5	< 0.001
	quit	239	130	54.4	51	21.3	58	24.3	0.04
	occasional smokers	148	59	39.9	25	16.9	64	43.2	
Do you follow the smoking status of your patients	never	461	116	25.2	234	50.8	111	24.1	< 0.001
	quit	236	32	13.6	144	61.0	60	25.4	
	occasional smokers	148	31	20.9	80	54.1	37	25.0	0.02
Do you ask your patients about their exposure to passive smoking	never	457	47	10.3	296	64.8	114	24.9	
	quit	458	158	34.5	177	38.6	123	26.9	< 0.001
	occasional smokers	236	48	20.3	114	48.3	74	31.4	0.005
	occasional smokers	146	39	26.7	61	41.8	46	31.5	< 0.001
	smokers	456	73	16.0	271	59.4	112	24.6	

Occasional smokers (70 or 47.6%) asked whether their patients smoked more often than smokers ( $\chi^2 = 15.07$ ;  $p < 0.001$ ).

The participants who had quit smoking asked this question in 42% of cases.

Patients were most frequently advised to quit smoking by the participants who had never smoked. The number was significantly higher compared to the smokers (60.5% vs 36.4%;  $\chi^2 = 17.26$ ;  $p < 0.001$ ). The same advice was also more often given by the participants who had quit smoking (54.4% vs 36.4%;  $\chi^2 = 4.23$ ;  $p = 0.04$ ).

The occasional smokers advised their patients to quit smoking in 39.9% of cases.

A total of 25.2% of non-smokers and 20.9% of occasional smokers followed smoking status of their patients. Statistically, this percentage was significantly higher compared to the group of smokers which formed 10.3%

ployees or that patient's chances to quit smoking are increased as a result of healthcare workers' advice. Moreover, they did not completely agree on whether medical workers should even advise patients about smoking. The differences in attitudes towards smoking between the smokers and non-smokers were noticed with regard to forbidding smoking in enclosed public places, as well as to agreement on whether passive smoking increases risk of lung and heart diseases.

Higher scores were noticed in the groups of physicians compared to nurses and the staff considering whether patients' chances to quit smoking are higher if medical workers advise them to quit, as well as whether indoor smoking should be banned. Compared to other staff, doctors and nurses more often believed that selling cigarettes to children and adolescents should be banned and that passive smoking is harmful to respiratory system.

Table 4

## Knowledge about and attitude towards smoking of healthcare professionals in Serbia

Knowledge and attitude towards smoking	Group of healthcare professionals	I agree completely	I agree	I am not sure	I do not agree	I disagree completely	Significance
		n (%)	n (%)	n (%)	n (%)	n (%)	
Smoking is harmful to health	Teaching physicians (n = 45)	37 (82.2)	6 (13.3)	1 (2.2)	0 (0.0)	1 (2.2)	ns
	Physicians (n = 439)	379 (86.3)	48 (10.9)	5 (1.1)	6 (1.4)	1 (0.2)	
	Nurses (n = 719)	572 (79.6)	118 (16.4)	8 (1.1)	18 (2.5)	1 (0.7)	
Healthcare professionals serve as role models for their patients and the public	Teaching physicians (n = 48)	31 (64.6)	9 (18.8)	2 (4.2)	5 (10.4)	1 (2.1)	A*
	Physicians (n = 440)	267 (60.7)	104 (23.6)	40 (9.1)	24 (5.5)	5 (1.1)	
	Nurses (n = 717)	386 (53.8)	180 (25.1)	80 (11.2)	64 (8.9)	7 (1.0)	
	Staff (n = 145)	66 (45.5)	41 (28.3)	14 (9.7)	18 (12.4)	6 (4.1)	
Patient's chances of quitting smoking are increased if they are advised by healthcare professionals	Teaching physicians (n = 48)	23 (47.9)	19 (39.6)	4 (8.3)	0 (0.0)	2 (4.2)	A/B/C*
	Physicians (n = 440)	185 (42.0)	289 (65.7)	18.4 (4.2)	44 (10.0)	3 (0.7)	
	Nurses (n = 721)	225 (31.2)	190 (26.4)	173 (24.0)	123 (17.1)	10 (1.4)	
	Staff (n = 144)	44 (30.6)	49 (34.0)	30 (20.8)	19 (13.2)	2 (1.4)	
Healthcare professionals should routinely ask about their patient's smoking habits	Teaching physicians (n = 47)	26 (55.3)	15 (31.9)	2 (4.3)	2 (4.3)	2 (4.3)	A
	Physicians (n = 437)	180 (41.2)	163 (37.3)	53 (12.1)	2 (4.3)	9 (2.1)	
	Nurses (n = 719)	235 (32.7)	317 (44.1)	77 (10.7)	32 (7.3)	5 (0.7)	
	Staff (n = 143)	44 (30.8)	60 (42.0)	15 (10.5)	85 (11.8)	5 (3.5)	
Healthcare professionals should routinely advise their smoking patients to quit smoking	Teaching physicians (n = 47)	29 (61.7)					E/C*
	Physicians (n = 441)	254 (57.6)	165 (37.4)	9 (2.0)	8 (1.8)	5 (1.1)	
	Nurses (n = 719)	331 (46.0)	297 (41.3)	61 (8.5)	23 (3.2)	7 (1.0)	
	Staff (n = 145)	61 (42.1)	66 (45.5)	11 (7.6)	5 (3.4)	2 (1.4)	
Smoking in enclosed public places should be prohibited	Teaching physicians (n = 48)	32 (66.7)	10 (20.8)	4 (8.3)	2 (4.2)	0 (0.0)	C/A/D*
	Physicians (n = 438)	260 (59.4)	104 (23.7)	32 (7.3)	25 (5.7)	17 (3.9)	
	Nurses (n = 721)	406 (56.3)	195 (27.0)	61 (8.5)	46 (6.4)	13 (1.8)	
	Staff (n = 145)	67 (46.2)	34 (23.4)	16 (11.0)	19 (13.1)	9 (6.2)	
Tobacco sales to children and adolescents should be banned	Teaching physicians (n = 48)	35 (72.9)	9 (18.8)	2 (4.2)	2 (4.2)	0 (0)	C/D
	Physicians (n = 437)	345 (78.9)	68 (15.6)	10 (2.3)	8 (1.8)	6 (1.4)	
	Nurses (n = 723)	555 (76.8)	142 (19.6)	16 (2.2)	8 (1.1)	2 (0.3)	
	Staff (n = 145)	98 (67.6)	34 (23.4)	5 (3.4)	3 (2.1)	5 (3.4)	
Passive smoking increases the risk of lung disease in non-smoking adults	Teaching physicians (48)	29 (60.4)	14 (29.2)	1 (2.1)	3 (6.3)	1 (2.1)	C/D*
	Physicians (n = 440)	279 (62.7)	120 (27.3)	32 (7.3)	7 (1.6)	5 (1.1)	
	Nurses (n = 718)	393 (54.7)	248 (34.5)	50 (7.0)	22 (3.1)	5 (0.7)	
	Staff (n = 146)	70 (47.9)	51 (34.9)	14 (9.6)	5 (3.4)	6 (4.1)	
Passive smoking increases the risk of heart disease in non-smoking adults	Teaching physicians (48)	26 (54.2)	16 (33.3)	2 (4.2)	3 (6.3)	1 (2.1)	C*
	Physicians (n = 442)	275 (62.2)	112 (25.3)	41 (9.3)	14 (3.2)	0 (0.0)	
	Nurses (n = 722)	392 (54.3)	256 (35.5)	54 (7.5)	15 (2.1)	5 (0.7)	
	Staff (n = 143)	71 (49.7)	45 (31.5)	19 (13.3)	3 (2.1)	5 (3.5)	

A – teaching physicians vs staff; B – teaching physicians vs nurses; C – physicians vs staff; D – nurses vs staff; E – physicians vs nurses; \* $p < 0.005$  between smokers and non-smokers.

The participants were also asked if they had ever received formal training on strategies for smoking cessation and whether they felt prepared to counsel patients on how to stop smoking. Twenty-five percent of nurses and 22% of doctors claimed they had received formal training. However, as Table 5 shows, only 35.7% of participants felt they were very well prepared to counsel patients, while 52.7% felt they

were somewhat prepared. In addition, 11.6% of examinees stated that they were not prepared at all.

In our sample, there were 255 participants who had quit smoking. They said the main reason for smoking cessation was medical (87.6%). Among females, 12.2% quit smoking due to pregnancy. Seven percent of participants quit smoking because of financial reasons. Other reasons for



Table 5

## Degree of "feeling prepared" among healthcare professionals in smoking cessation counseling

Degree of preparedness for smoking cessation	Teaching physicians	Physicians	Nurses	Staff	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
Very well prepared	19 (39.6)	159 (35.1)	271 (37.1)	45 (30.0)	494 (35.7)
Somewhat prepared	24 (50.0)	240 (53.0)	380 (51.9)	84 (56.0)	728 (52.7)
Not at all prepared	5 (10.4)	54 (11.9)	81 (11.0)	21 (14.0)	161 (11.6)

quitting smoking were stated in 2.4%. Only 3 participants quitted smoking out of awareness that smoking harms health of their children. Among ex-smokers, 73.5% answered they smoked every day and 26.5% said they smoked occasionally.

Out of the total number of smokers, most of them stated that they were not ready to quit smoking in the next 6 months (41.1% physicians and 52.7% nurses). There were 44.2% physicians and 41% nurses who were thinking about quitting smoking, while only 14.7% of physicians and 13.8% of nurses were ready to quit immediately.

### Discussion

According to our data, the prevalence of smokers among physicians in Serbia is 34.13%. Out of this percentage, everyday smokers form 23.35% and occasional 10.78%. The prevalence among nurses is 51.78%, out of which 39.48% are everyday smokers and 12.30% are occasional smokers. In our sample, there are 46.4% men and 45.41% women who smoke. These data put Serbia among the top countries according to the number of smokers.

Considering the meta-analysis which included 81 studies conducted in English language over the past 30 years<sup>20,21</sup>, the highest prevalence was recorded in Greece, where as much as 49% of physicians were smokers<sup>22</sup>. The highest prevalence of smokers among physicians in China was 49% (61% men, 12% women)<sup>23</sup>. In Bosnia and Herzegovina, there were 40% of physicians and 51% of nurses who smoke<sup>24</sup>. The lowest prevalence was recorded in the USA, Great Britain and Australia with only 3% of smokers, and New Zealand with only 5%<sup>25-29</sup>.

According to the final report of the Ministry of Health of the Republic of Serbia published in May 2006, there were 33.6% smokers in Serbia, of whom 38.1% were men and 29.9% women. Compared to the year 2000, the number is lower by 6.9%. Our study points out that the prevalence of smokers among the staff is higher than in general population, which is a negative model in anti-smoking campaigns and reduces their efficiency.

In the study conducted in 2008 by Harmon et al.<sup>30</sup> it was established that the prevalence was 38% of men and 37% of women physicians in Serbia, which is slightly more than in our sample.

It is necessary to point out several limitations of the study. First of all, the questionnaire was self reported and not validated, so there is a chance that the prevalence of smokers is higher than shown. As physicians know more about the devastating effects of smoking than the general population, they may be prone to self-deception or understatement, and their underreporting could differ from the general population.

The second limitation can be related to 78% of responding rate. There is a possibility that those who did not give any response had different opinions than the participants in the survey, and there is also a chance that they were smokers. In addition, there were no participants from Kosovo, where the prevalence of smokers is expected to be higher than in the rest of Serbia. Since the survey relied primarily on self-reports, there may be a possibility that physicians over-reported their advisory activities concerning smoking cessation.

It is interesting that one of the first epidemiological researches concerning the harmful effects on health caused by smoking were conducted by Doll and Hill<sup>31</sup> on a British Doctors Cohort in 1954 and published 50 years later in the British Medical Journal<sup>32</sup>. It can be said that this was the turning point in public healthcare approach to the treatment and control of smoking.

A smoking status of a physician seems to be a very important determinant of how they address their patient's tobacco use. It appears that doctors who smoke are less willing to inquire about tobacco use, to advise cessation, and to provide evidence-based assistance when compared to their non-smoking colleagues<sup>33,34</sup>. In countries where anti-smoking strategies have been long in use, such as Canada, the USA, Sweden, Australia, and the UK, this is not a major problem since physicians smoking rates are very low. In many other countries the smoking rate among physicians is similar to that of the general population<sup>35,20</sup>. In spite of the evident knowledge considering the consequences of smoking, the persistence of healthcare professionals in this detrimental habit may ruin the global efforts to help smokers quit using specific clinical assistance and interventions.

There are at least two reasons why the data of the prevalence of smoking among physicians is useful. First, such information may point to the possibilities of succeeding in anti-tobacco campaigns. In countries where there are high numbers of physicians who smoke, it is difficult to convince the general population that smoking has detrimental effect on their health. Second, the prevalence of smoking among physicians may reflect the 'maturity' of the smoking epidemic in a particular country. As the dangers of smoking become better known, medical profession will give up smoking earlier than the general population. The smoking epidemic of a country may be considered 'mature' when the prevalence of smoking among doctors is lower than that of the general population.

Considering the questions of knowledge and attitude, the differences in agreement with regard to the responsibilities of healthcare professionals and smoking policy could be expected between the "ever" and "never" smokers. However,

such differences were not expected between the physicians and nurses. Regarding the knowledge of harmful effects of smoking, overall results were quite positive.

Counseling by healthcare professionals on smoking cessation is crucial if their patients plan to quit smoking. The relatively high rates of healthcare professionals with formal training reflect the sampling frame of participants. And indeed, almost 90% felt very or somewhat well prepared to counsel their patients on smoking cessation. However, it may be possible that healthcare professionals who are not actively counseling patients on smoking cessation may underestimate the difficulty of successfully supporting their patients through to smoking cessation. More formal training in smoking cessation strategies through continuing education of healthcare professionals in Serbia may be justified, especially if you consider that 21.2% doctors smoke in front of their patients.

Physician training has the potential to reduce the barriers in providing assistance to patients; there is evidence of a dose response relationship between the time spent on training and doctor activity in the promotion of smoking cessation<sup>17,36</sup>.

The results of this study show that there are needs for more aggressive nationwide non-smoking campaigns for physicians and medical students, as well as smoke-free hospital campaigns; however, this is only the first necessary

step. Further interventions can target physicians smokers, monitor smoke-free hospitals, and educate about effective smoking cessation practices. Experiences from countries where doctors smoke less and more effectively carry out smoking cessation practices need to be shared with Serbian doctors in order to improve the smoking behavior of Serbian doctors and their smoking cessation practices.

### Conclusion

Considering the fact that smoking epidemic is spreading quickly and aggressively, as well as the high level of prevalence among smoking physicians in Serbia, the conclusion is that there is a need for more aggressive and more specific anti-smoking campaigns directed to medical employees. An effort must be made so that medical students do not become smokers. Assisting medical employees in smoking cessation help them achieve self-improvement as well as the improvement of population in general.

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