SMOKING BEHAVIORS IN KOSOVA: RESULTS OF STEPS SURVEY
KADILSKO VEDENJE NA KOSOVU: REZULTATI ANKETE STEPS

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ABSTRACT

Keywords:
prevalence,
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Introduction. Tobacco use continues to be the leading global cause of preventable death. Most of these deaths occur in low and middle-income countries, and this trend is expected to widen further over the next several decades. The overall objective of the study is to describe and analyse the smoking behaviours of adults in Kosova.

Methods. According to the STEPs methodology, 6,400 respondents, aged 15 - 64 years, are selected randomly within each sex and 10-year age-group. Out of 6,400 participants, 6,117 were selected, which is approximately 95.6%.

Results. The prevalence of smoking was higher among males (37.4%) compared with females (19.7%). In all age groups, the prevalence of smoking was higher among males compared with females. Regarding the age group of 15 - 24 years, the prevalence of smoking was 16.0%, but in the age group of 25 - 34 years, it nearly doubled to the rate of 31.9%. We have a smaller increase in the age group of 35 - 44 years, and after the age of 45, it falls gradually.

Conclusions. The prevalence of smoking in Kosova is high compared with other countries in Eastern Europe. In future decades, Kosova will face a high probability of an increased burden of smoking-related diseases.

IZVLEČEK

Ključne besede:
prevalenca,
kajenje, Kosovo,
odrasli

Uvod. Uživanje tobaka je še vedno eden izmed glavnih vzrokov smrti, ki bi jih lahko preprečili. Večina teh smrti se zgodi v državah z nižjim in srednjim prihodkom, po pričakovanjih pa se bo ta trend v naslednjih nekaj desetletjih še povečal. Cilj te študije je opis in analiza kadilskega vedenja odraslih na Kosovu.

Metode. Glede na metodologijo STEPS je bilo naključno izbranih 6.400 anketirancev obeh spolov, starih med 15 in 64 let; razdeljeni so bili v starostne skupine po 10 let. Izmed 6.400 anketirancev jih je bilo v študijo vključenih 6.117, kar je približno 95,6%.

Rezultati. Prevalenca kajenja je bila večja med odraslimi moškimi (37,4%) v primerjavi z ženskami (19,7%). V vseh starostnih skupinah je bila prevalenca kajenja višja med moškimi kot med ženskami. V starostni skupini med 15 in 24 let je bila prevalenca kajenja 16,9%, v starostni skupini med 25 in 34 let pa se je skoraj podvojila (31,9%). Prav tako je prisotno manjše povišanje v starostni skupini med 35 in 44 let, po 45. letu pa odstotek postopno pada.

Zaključki. Prevalenca kajenja na Kosovu je v primerjavi z ostalimi državami v Vzhodni Evropi visoka. V prihodnosti se bo Kosovo soočalo z visoko verjetnostjo povišanega bremena zaradi bolezni, povezanih s kajenjem.

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1 INTRODUCTION

Tobacco use continues to be the leading global cause of preventable death. It kills nearly 6 million people annually, and it causes hundreds of billions of dollars in economic damage worldwide. Most of these deaths occur in low and middle-income countries, and this trend is expected to widen further over the next several decades. If current trends continue, by 2030, tobacco will kill more than 8 million people worldwide each year (1). Smoking increases the risk of heart disease, cancer, stroke, and chronic lung disease. Environmental tobacco smoke has been demonstrated to increase the risk of heart disease and cancer among non-smokers. It has also been shown that non-smokers exposed to second hand smoke have a 25% to 35% increased risk of suffering acute coronary diseases, and increased frequency of chronic respiratory conditions (2). Cessations of smoking by current smokers reduce their risk of heart disease, cancer, stroke, and respiratory disease (3).

Tobacco use prevalence in Europe is characterized by large disparities, with Western nations reporting smoking rates generally below 25%, while Eastern nations have smoking rates usually above 30% (4). In total, in the European region, 45% of males and 24% females over 15 years old are smokers (5). Kosova is a country with some specifics, for example, Kosova's economic performance at the last assessment was evaluated as relatively weak as compared to Southeastern Europe. Kosova's economy would need to grow 10% to 12% per annum respectively for the next ten years to reach Albania's and Montenegro's income level (6). The total population in Kosova according to the census of 2011 is 1,739,825 inhabitants (7), Birth rate 15.7‰ and Total Mortality 3.2‰. The mean age of population is estimated to be 30.2 years and life expectancy at birth is 76.7 years: 79.4 years for females and 74.1 for males. In the years 2012 and 2013 the number one cause of death in Kosova were circulatory system diseases and the number two cause were neoplasm's (8). Due to lack of law on statistics and weak implementation of the health law as well as relevant existing by laws, health information flow remains fragmented and weak. Until recently, no reliable epidemiological data were available on the prevalence of smoking in Kosova adults. A study with school children (9) and first year medical students was available (10). In 2011 Kosova conducted the European School Survey Project on Alcohol and Other Drugs (ESPAD) on 15-16 years old school children (11). As this is the first representative population survey conducted in Kosova findings from this survey will help policymakers to develop future public health programmes and interventions. The overall objective of the study is to describe and analyze the smoking behaviors of adults in Kosova.

2 METHODS

A population-based survey for non-communicable diseases risk factors started in September 2010 by adopting the World Health Organization (WHO) STEPs Instrument (12), and the data collection was completed in March 2011. At that time the census of population in Kosova wasn't conducted, therefore the data for households according to the settlements from Statistical Agency of Kosova for 2008 were used (13), in total seven regions, 30 municipalities and 1464 settlements. The two-stage cluster random sampling was designed. Firstly, 120 enumeration areas were selected using probability proportional to size as the primary sampling units, followed by randomly selecting households from them as the secondary sampling units, using the proportion of households in urban and rural areas. Respondents aged 15-64 years old were selected randomly within each gender and 10-year age-group. One resident aged 15 to 64 years within each of the households was recruited for the survey using the Kish method, which provides tool for random selection of one individual from a household (12). The total sample size consisted of 6,400 men and women. The following assumptions for this cross-sectional study were used for sample size calculation: level of confidence 95%, margin of error 5%, baseline level of risk factors 50%, expected response rate 90% and the design effect of 1.5.

The WHO STEPs module is recommended for use on adults in the age group 25-64 years (12). The age group of 15-24 years, which is the optional age group in STEPs, were included in this study because according to the existing data, Kosova has a high percentage of young people in it's population (around 19.3% of population are in this age group) (7) .

2.1 Measurements

STEPs is a sequential process with three steps. Step 1 includes assessment of smoking behaviors, alcohol consumption, physical activity, and fruit and vegetable intake using a structured questionnaire. Step 2 includes physical measurements, i.e. weight, height, waist circumference, hip circumference, blood pressure and heart rate measurements. Step 3 includes blood sampling and blood sugar and cholesterol examination. In this study we present only data of smoking behavior from Step 1 and answers on the core questions: Do you currently smoke any tobacco products, such as cigarettes, cigars or pipes? Do you currently smoke tobacco products daily? How old were you when you first started smoking daily? On average, how many of the following (manufactured cigarettes; Hand-rolled cigarettes; Pipes full of tobacco; Cigars, cheroots, cigarillos) do you smoke each day?

Table 1.   Response proportions by gender.

Age Group (Year)	Men			Women			Both Sexes		
	Eligible	Responded		Eligible	Responded		Eligible	Responded	
	n	n	%	N	n	%	N	n	%
15-24	640	633	98.9	640	637	99.5	1280	1270	99.2
25-34	640	603	94.2	640	607	94.8	1280	1210	94.5
35-44	640	594	92.8	640	610	95.3	1280	1204	94.1
45-54	640	624	97.5	640	607	94.8	1280	1231	96.2
55-64	640	594	92.8	640	608	95.0	1280	1202	93.9
15-64	3200	3028	94.6	3200	3089	96.5	6400	6117	95.6
25-64	2560	2415	94.3	2560	2432	95.0	5120	4847	94.7

Current smokers were defined as persons who reported smoking any tobacco products, such as cigarettes, cigars, or pipes daily or non-daily irrespective of the quantity and current daily smokers if they smoked ≥1 cigarette per day (12).

2.2 Statistical Analysis

Statistical analysis was undertaken using SPSS version 22.0. As age and sex are strong determinants of smoking, descriptive results were presented for men and women separately and stratified by age group. Data are presented as percentage and 95% confidence interval. Chi-square test or Fisher exact test was performed to test the differences in proportions of qualitative variables between groups, Mann Whitney U test for testing the difference between quantitative variables when distribution was not normal and Student t-test when distribution was normal. The level $P<0.05$ was considered as statistically significant.

Out of 6,400 persons planned for research, 6,117 were included, which is approximately 95.6%. The response rate was slightly higher among females 96.5% compared with males 94.6%. The response rate has been higher among 15-24-year-old participants with 99.2% (Table 1). Of the total respondents, 49.5 % were men. Four in ten of them had primary or lower education (from one to eight years of education). 64.7% were currently married. The mean number of family members more than 18 years old, excluding a responder, was 4.7 (Table 2).

3 RESULTS

In the age group 15-64 years old the prevalence of smoking was 28.4%. Prevalence of smoking was higher among men 37.4% compared with women 19.7%, with significant difference (P<0.001). In all age groups, the prevalence of smoking was higher among men compared to women.

Table 2.   Distribution of the sample by gender, age, education, marital status and number of family members - Kosova STEPS survey 2011.

	N	%
Gender		
Male	3028	49.5
Female	3089	50.5
Age - group (year)		
15-24	1270	20.8
25-34	1210	19.8
35-44	1204	19.7
45-54	1231	20.1
55-64	1202	19.7
Education		
Primary or less	2438	39.9
Secondary	2345	38.3
Tertiary	1334	21.8
Marital status		
Never married	1912	31.3
Currently married	3960	64.7
Separated	14	0.2
Divorced	19	0.3
Widowed	163	2.7
Cohabitating	19	0.3
No answer	30	0.5
Nr. of family member more than 18 years except you		
Mean±SD	4.7±2.4	

Prevalence of smoking increases with age. After the age of 45 it falls gradually, probably due to starting quitting smoking for health reasons, and this trend of prevalence is noticed in both sexes (Table 3).

Table 3.   Percentage of current smokers by gender - Kosova STEPS survey 2011.

Age Group (years)	Men			Women			Both Sexes			P-value*
	n	Current smoker		n	Current smoker		n	Current smoker		
		n	% (95% CI)		n	% (95% CI)		n	% (95% CI)	
15-24	633	127	20.7 (17.7 - 24.1)	637	76	11.6 (9.3 - 14.6)	1270	203	16.0 (14.1 -18.1)	0.000
25-34	603	255	42.3 (38.4 - 46.3)	607	131	21.6 (18.5 - 20.5)	1210	386	31.9 (29.3 -34.6	0.000
35-44	594	290	48.8 (44.8 - 52.8)	610	154	25.2 (22.0 - 28.8)	1204	444	36.9 (34.2 - 39.6)	0.000
45-54	624	254	40.7 (36.8 - 44.6)	607	139	22.9 (19.7 - 26.1)	1231	393	31.9 (29.4 - 34.6)	0.000
55-64	594	205	34.5 (30.7 - 38.3)	608	109	17.9 (15.1 - 21.2)	1202	314	26.1 (23.7 - 28.7)	0.000
15-64	**3028**	1131	**37.4 (35.6 - 39.1)**	**3089**	609	**19.7 (18.4 - 21.2)**	**6117**	**1740**	**28.4 (27.3 - 29.6)**	0.000
25-64	2415	1004	41.6 (39.6 - 43.6%)	2432	533	21.9 (20.3 - 23.6%)	4847	1537	31.7 (30.4 - 33.0%)	0.000

*Chi-square test or Fisher exact test

Among the current smokers of ages 15 – 64, current daily smokers were 90.1%. The rate of current daily smokers among men was 94.2% compared to women 82.4%. The lowest prevalence of daily smoking is recorded in the age-group 15-24 years with 82.8%. In all age-groups the daily smoking prevalence was higher among men compared with women (Table 4).

Table 4.   Current daily smokers among current smokers - Kosova STEPS survey 2011.

Age Group (years)	Men			Women			Both Sexes			P-value*
	Current smoker (n)	Current daily smokers		Current smoker (n)	Current daily smokers		Current smoker (n)	Current daily smokers		
		n	% (95% CI)		n	% (95% CI)		n	% (95% CI)	
15-24	127	114	89.8 (83.3 - 93.9)	76	54	71.1 (60.0 - 80.0)	203	168	82.8 (77.0 - 87.3)	0.001
25-34	255	243	95.3 (92.0 - 97.3)	131	115	87.8 (81.1 - 92.3)	386	358	92.7 (89.7 - 94.9)	0.013
35-44	290	273	94.1 (90.8 - 96.3)	154	130	84.4 (77.9 -89.3)	444	403	90.8 (87.7 - 93.1)	0.001
45-54	254	240	94.5 (91.0 - 96.7)	139	113	81.3 (74.0 - 86.9)	393	353	89.8 (86.4 - 92.4)	0.000
55-64	205	195	95.1 (91.3 - 97.3)	109	90	82.6 (74.4 - 88.5)	314	285	90.8 (87.1 - 93.5)	0.001
15-64	**1131**	1065	**94.2 (92.6 - 95.4)**	**609**	502	**82.4 (79.2 - 85.2)**	**1740**	**1567**	90.1 (88.6 - 91.4)	0.000
25-64	1004	951	94.7 (93.2 - 95.9)	533	448	84.1 (80.7 - 86.9)	1537	1399	91.0 (89.5 -92.4)	0.000

*Chi-square test or Fisher exact test

Table 5. Mean age of starting smoking by gender – Kosova STEPS survey 2011.

Age Group (years)	Percentage of current smokers						P-value
	Men		Women		Both Sexes		
	n	Mean age (95% CI)	n	Mean age (95% CI)	n	Mean age (95% CI)	
15-24	114	16.2 (15.7 - 16.7)	54	17.4 (16.8 - 18.0)	168	16.6 (16.2 - 17.0)	0.003
25-34	243	18.2 (17.7 - 18.7)	115	19.4 (18.5 - 20.3)	358	18.6 (18.1 - 19.0)	0.002
35-44	273	19.6 (19.0 - 20.3)	130	22.3 (21.1 - 23.5)	403	20.5 (19.9 - 21.1)	0.000
45-54	240	21.0 (20.0 - 21.9)	113	25.5 (23.8 - 27.1)	353	22.4 (21.5 - 23.3)	0.000
55-64	195	22.1 (20.9 - 23.4)	90	31.2 (28.8 - 33.6)	285	25.0 (23.8 - 26.2)	0.000
15-64	**1065**	**19.7 (19.3 - 20.1)**	**502**	**23.4 (22.6 - 24.2)**	**1567**	**20.9 (20.5 - 21.3)**	0.000
25-64	951	20.1 (19.7 - 20.5)	448	24.1 (23.3 - 24.9)	1399	21.4 (21.0 - 21.8)	0.000

*Mann Whitney U test or Student t-test

The mean age of starting smoking was 20.9 years. Among men the mean was 19.7 years, while among women the mean was 23.4 years, with significant difference (P<0.001), (Table 5).

Among the daily smokers aged 15-64 years, 93.6% smoke manufactured cigarettes, men 92.7% and women 95.6% (Table 6).

Table 6. Manufactured cigarette smokers among daily smokers by gender - Kosova STEPS survey 2011.

Age Group (years)	Manufactured cigarette smokers among daily smokers									P-value*
	Men			Women			Both Sexes			
	Daily smokers (n)	Manufactured cigarette smokers		Daily smokers (n)	Manufactured cigarette smokers		Daily smokers (n)	Manufactured cigarette smokers		
		n	% (95% CI)		n	% (95% CI)		n	% (95% CI)	
15-24	114	108	94.7 (89.0 -97.6)	54	53	98.1 (90.2 - 98.1)	168	161	95.8 (91.7 - 98.0)	0.431
25-34	243	224	92.2 (88.1 - 94.9)	115	107	93.0 (86.9 - 96.4)	358	331	92.5 (89.2 - 94.8)	0.833
35-44	273	255	93.4 (89.8 - 95.8)	130	124	95.4 (90.3 - 97.9)	403	379	94.0 (91.3 - 96.0)	0.506
45-54	240	222	92.5 (88.5 - 95.2)	113	110	97.3 (92.5 - 99.1)	353	332	94.1 (91.1 - 96.1)	0.090
55-64	195	178	91.3 (86.5 - 94.5)	90	86	95.6 (89.1 - 98.3)	285	264	92.5 (89.0 - 95.1)	0.232
15-64	**1065**	987	**92.7 (91.0 -94.1)**	**502**	480	**95.6 (93.5 - 97.1)**	**1567**	**1467**	**93.6 (92.3 - 94.7)**	0.026
25-64	951	879	92.4 (90.6 - 93.9)	448	427	95.3 (92.9 -96.9)	1399	1306	93.4 (91.9 - 94.5)	0.050

*Chi-square test or Fisher exact test

The mean amount of manufactured cigarettes smoked during the day by smokers aged 15-64 years was 20.9 cigarettes, in men 23.9 cigarettes and in women 14.7 cigarettes. In all age groups men smoke more than women (P<0.0001), (Table 7).

Table 7. Mean amount of manufactured cigarettes used by daily smokers by gender - Kosova STEPS survey 2011.

Age Group (years)	Mean amount of manufactures cigaretes used by daily smokers						P-value*
	Men		Women		Both Sexes		
	n	Mean age (95% CI)	n	Mean age (95% CI)	n	Mean age (95% CI)	
15-24	108	18.4 (16.9 - 19.9)	53	12.9 (10.8 - 14.9)	161	16.6 (15.3 - 17.8)	0.000
25-34	224	21.6 (20.3 - 22.8)	107	11.9 (10.6 - 13.2)	331	18.4 (17.4 - 19.5)	0.000
35-44	255	24.2 (22.9 - 25.4)	124	14.0 (12.6 - 15.3)	379	20.8 (19.8 - 21.9)	0.000
45-54	222	26.8 (25.0 - 28.5)	110	16.1 (14.2 - 18.0)	332	23.2 (21.8 - 24.7)	0.000
55-64	178	26.0 (24.3 - 27.8)	86	18.5 (16.6 - 20.5)	264	23.6 (22.2 - 25.0)	0.000
15-64	**987**	**23.9 (23.2 - 24.6)**	**480**	**14.7 (13.9 - 15.5)**	**1467**	**20.9 (20.3 - 21.4)**	0.000
25-64	879	24.5 (23.8 - 25.2)	427	14.9 (14.1 - 15.7)	1306	21.4 (20.8 - 22.0)	0.000

*Mann Whitney U test or Student t-test

4 DISCUSSION

This is the first comprehensive population-based survey on risk factors of Non communicable diseases (NCDs) among adults in Kosova. Our study shows that Kosova is among the countries with high prevalence of smoking. 31.7% of respondents aged 25-64 years are current smokers. Findings of this survey confirmed that cigarette smoking was more prevalent among men than women in Kosova (41.6% vs. 21.9%: P<0.001).

The prevalence is similar with the prevalence of smoking among school children in Kosova (9). Students aged between 13 and 15 years reported smoking cigarettes with 37%. In Kosova, from the ESPAD survey on 15-16-year-old school children in 2011, the frequency of lifetime cigarette use was reported in 35.0 % (boys 48.0% vs. girls 25.0%), (11).

Another study (24) with 261 students from 4 secondary schools in Guilin, a town in south-east Kosova, found that 36% reported to have smoked cigarettes every day. Girls consumed more cigarettes, and the incidence of smoking was higher among students in their last year of high school studies.

In the study with the first year medical students, University of Prishtina, Kosova, (14) the prevalence of daily smokers was 8.9% (9.1% men vs. 8.7% women) for general medicine students and 5.8% (4.8% men vs. 6.5% women) for dentistry students. This shows that the medical students in Kosova smoke less compared with the general population.

The prevalence of smoking among Kosova adults is similar to the prevalence of smoking in most of Balkan countries (15). Compared to other studies from Balkan countries, Kosova has lower prevalence than Bosnia and Herzegovina (16, 17) and Albania (18, 19), but higher prevalence than Croatia (20, 21) and Slovenia (22, 23). In 2010, a face-to-face survey on smoking in 18 European countries of the population aged 15 years or older was conducted. Overall, 27.2% of the participants were current smokers (30.6% of men and 24.1% of women) (4). Our results show that the prevalence of current smokers in Kosova is higher than the European average, but lower than the prevalence in Bulgaria and Greece.

Similar studies (24) with adults aged over 18 years from 48 states which have reported their data, current daily smokers in the Middle-income country group among men was 34.1% and among women 10.8%. A current daily smoker in the Low-income country group was reported among men in 25.2%, and among women in 6%. In most countries, the prevalence of smoking is higher among

men, except in Sweden, where smoking prevalence is higher among women (25). The prevalence of smoking in Kosova adults is higher among men compared to women. According to the age group, the highest prevalence of smoking in Kosova was among 25-34yearolds (31.9%) and 35-44yearolds (36.9%) and 45-54yearolds (31.9%).

In the United States of America (USA), in 2014, nearly 17 of every 100 USA adults aged 18 years or older (16.8%) currently smoked cigarettes (men 18.8% vs. women 14.8%). Current cigarette smoking was higher among persons aged 25–44 years (20.0%), (26, 27).

In our study, among the smokers aged 15-64 years, 90.1% were daily smokers. The average number of cigarettes smoked during the day was 20.9 cigarettes, for men 23.9 cigarettes and for women 14.7 cigarettes. It is higher than in Germany (28), where the average number of cigarettes smoked per day is 10, and Greece (29) where the average number of cigarettes smoked per day is 19.8. Among the daily smokers aged 15-64 years, 93.6% smoked manufactured cigarettes. In 2012, in a study done in 187 countries (30), there were 75 countries where the average number of cigarettes per daily smoker was higher than 20 cigarettes per day.

There is evidence that comprehensive tobacco control programmes reduce smoking prevalence (31), and the implementation of those policies has decreased the prevalence of smoking,for example, in the USA, Canada, Ireland, Norway, The Great Britain and Iceland (32-37). At the time when the research was being conducted, there was no legislation on tobacco control in Kosova; there were only health education activities for quitting tobacco consumption and a few health warnings on boxes of tobacco. The law for tobacco control in Kosova came into force in May 2013. Therefore, these kind of studies (STEPs) need to be repeated in order to measure the effect of such actions to smoking prevalence, especially in places where the implementation of those measures is not satisfactory.

The limitation of the study is that, as the data were from a cross-sectional survey, a structured questionnaire was used to assess tobacco use by face-to-face interviews; this could have resulted in over-reporting or under-reporting of smoking. The age of smoking initiation may also be subject to recall bias. Although these limitations exist, our study offers valuable data for tobacco control and prevention in Kosova.

5 CONCLUSIONS

The prevalence of smoking in Kosova is high compared with other countries in Eastern Europe. In future decades, Kosova will face a high probability of an increased burden of smoking-related diseases. A special attention should be paid to coordinated government- and community-based interventions, using the guidelines to implement and manage tobacco control, ratified by the WHO Framework Convention on Tobacco Control and proven measures to strengthen country level interventions in reducing cigarette smoking and smoking-related diseases and deaths among Kosova adults.

ETHICAL APPROVAL

Received from the Ethical Committee of the Medical Faculty, University of Prishtina, number 4483.

AUTHOR'S CONTRIBUTION

MB, SV, ADz and NR participated in design of the study, sample size, methodology and corrections of the manuscript. SG contributed to the design of the study, field work and statistical analysis. JK contributed in all phases and the correction of manuscript. MG compared the results with other studies. All authors have read and approved the final manuscript.

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