

# Health Related Quality of Life of Smokers in Croatia

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## ABSTRACT

*The aim of this study was to investigate the health related quality of life (HRQOL) in relation to the smoking status. The data from the Croatian Adult Health Survey conducted in 2003 were used for this study. Sample comprised 9,070 participants, 68.1% women and 31.9% men, from 18 to 101 years old. Results indicated that there were significant differences in HRQOL between smokers and non-smokers even in a young adult age when there is no difference in objective health status (for example diagnosis of disease). Generally health decreased with the age for both groups but direction of difference between smokers and non-smokers varied for different health dimensions across the age groups. The most notable difference in HRQOL in relation to smoking was found in the age group of 65 and older where women smokers reported better HRQOL than non-smokers, and men smokers significantly worse HRQOL than non-smokers. As we found significant differences according to gender in age groups, we suggest that it is essential for future studies to take those characteristics into consideration. Many other factors, for example education, income, marital status, and the socio-cultural acceptability of smoking may have an impact on the quality of life, and also need to be considered in future research. The existing differences in mental health and social functioning should be taken into account in planning of the future prevention programs.*

**Key words:** smoking, health related quality of life, Croatian Adult Health Survey

## Introduction

Tobacco kills one person globally every six seconds<sup>1</sup>. It also kills a third to half of all people who use it<sup>2</sup>, on average 15 years prematurely<sup>2-4</sup>. Today, tobacco use causes 1 in 10 deaths among adults worldwide – more than five million people a year<sup>1</sup>. By 2030, unless action is taken, tobacco's annual death toll will rise to more than eight million<sup>1,5</sup>. If current trends continue unchecked, it is estimated that around 500 million people alive today will be killed by tobacco<sup>6</sup>. During twenty-first century, tobacco could kill up to one billion people<sup>7</sup>. All forms and ways of using tobacco are potentially lethal<sup>8</sup>. Smoked tobacco in any form causes up to 90% of all lung cancers and is a significant risk factor for strokes and fatal heart attacks<sup>9</sup>. Second-hand smoke is responsible for an estimated 430 cases of sudden infant death syndrome in the United States, 24,500 low-birth-weight babies, 71,900 pre-term deliveries and 200,000 episodes of childhood asthma annually<sup>10</sup>. Smokeless tobacco is also highly addictive and causes cancer of the head and neck, esopha-

gus and pancreas, as well as many oral diseases<sup>8,11</sup>. There is evidence that some forms of smokeless tobacco may also increase the risk of heart disease and low-birth-weight babies<sup>12</sup>.

In Croatia, a total of 27.4% of adults are every day smokers<sup>13</sup>. A survey conducted in 1972 showed the prevalence of daily cigarette smoking was 56.9% in men and 10.1% in women<sup>13</sup>. Since then, smoking habit has decreased in men and increased in women<sup>13</sup>. Most studies on the impact of cigarette smoking or smoking cessation address specific health, morbidity, and mortality outcomes. Although smoking is recognized health risk, people who smoke often do not experience any deterioration in health and quality of life. In a case of smoking, for some it is even contrary, they feel better socially and psychologically when they smoke. However, smoking is one of the recognized risk factors for chronic diseases. The effect of smoking on physical health is cumulative, so peo-

ple, who do not smoke for a long time, especially if they are young, do not experience any health problems. Effects on health and well-being are usually seen in later life. Relatively fewer studies have examined the effect of smoking and smoking cessation on well-being and health-related quality of life.

Health-related quality of life (HRQOL) is patient based perception of the QOL, but focuses more on the impact of a perceived state of health on the ability to live a fulfilling life<sup>14</sup>. It is important to emphasize that health related quality of life is distinct construct from subjective quality of life as a whole, which comprised more than just health domain<sup>15</sup>. Quality of life is the construct which have been described by many definitions. The quality of life term contains the information on an individual's physical, psychological, social and spiritual condition. The quality of life evaluation is carried out by means of generic and specific questionnaires<sup>16</sup>. Measurement of quality of life is increasingly being required and used in evaluative research and the planning of health services. Generic questionnaires generally evaluate a patient's overall condition regardless of his disease. Specific questionnaires are designed for the evaluation of a patient's overall condition in a particular type of disease. Modules are often used within specific questionnaires. These modules are focused on specific symptoms and complaints in a particular type of disease<sup>17</sup>. The purpose of this study was to investigate the health related quality of life in relation to the smoking status in adult population in Croatia using generic HRQOL questionnaire so results of Croatian health survey can be compared with other researches and between population subgroups irrespective to health condition they have.

## Methods

This study was a part of a broader research – Croatian Adult Health Survey (CAHS) which covered a wide range of health-related variables, many of them presented in other papers in this special issue<sup>18,19</sup>. Survey targeted persons aged 18 years or older who are living in private dwellings in The Republic of Croatia. The 2001 Croatian Census of Population has been used to select a representative sample of households to be included in this survey. A total of 10,766 households were selected to participate in the 2003 CAHS based on multistage stratified cluster sampling design. A questionnaire was administered face to face to respondents at their home by trained community nurses. Health status was assessed with the Short Form 36 Health Survey questionnaire (SF-36)<sup>20</sup>. It has been designed to be short enough to be practical for use in large-scale studies. Although it was developed for clinical applications, SF-36 has been designed as a general outcome measure, which attempts to measure aspects of health that are important to all patients, and so is readily applicable to the general population. Questionnaire contains 36 items that, when scored, yield 8 domains. Physical functioning – PF (10 items) assesses limitations in physical activities, such as walking and climbing stairs.

The role physical – RP (4 items) and role emotional – RE (3 items) domains measure problems with work or other daily activities as a result of physical health or emotional problems. Bodily pain – BP (2 items) assesses limitations due to pain, and vitality – VT (4 items) measures energy and fatigue. The social functioning domain – SF (2 items) examines the effect of physical and emotional health on normal social activities, and mental health – MH (5 items) assesses psychological distress and well-being measuring happiness, nervousness and depression. The general health perceptions domain – GH (5 items) evaluates personal health in general. All results were transformed and score were calculated for 8 dimensions of health on a scale from 0 to 100, with 0 representing the worse and 100 represents best possible health state. In Croatian Adult Health Survey Croatian version of SF-36 questionnaire was used<sup>21,22</sup>.

Smoking status was assessed by several questions in Survey, we were here focusing on variable represented by single question on present smoking: »Do you smoke at the present time (cigarettes, cigars, pipe)?«.

## Statistics

Since we expected different health profiles according to age and gender, all results were presented stratified to those characteristics. Due to non-normal data distribution the difference in HRQOL between smokers and non-smokers for each group were tested with Mann-Whitney test. A significance level was presented for each group and health dimension in tables 1–3.

## Results

Out of 10,766 selected households a response was obtained from 9,070 individuals which results in an overall response rate of 84.3%. There were 6,180 women (which represent population of 1,839,163) and 2,890 men (which represent population of 1,640,425 men). The average age was 53.96 years (SD = 17.02) ranging from 18 to 101 years of age. Participants were classified in three age groups: from 18 to 34 years, from 35 to 64 and 65 years and older in third group. In order for estimates produced from survey data to be representative of the Croatian population, and not just the sample itself, weighting value was incorporated into the calculations. A survey weight is given to each person included in the final sample, that is, the sample of persons having answered the survey. For each person weight was created according to gender, age, education and region of living. This weight corresponds to the number of persons represented by the respondent for the entire population.

The data generally showed the tendency of decreasing health related quality of life with increasing age, with the most pronounced differences occurring in the physical health dimensions. Although difference between smokers and non-smokers was revealed in a favor of non-smokers, men and women in youngest age group reported excellent physical functioning, without pain and limitation due to physical problems irrespective to smoking status.

Similarly they scored high on social functioning and mental health. Somewhat lower on general health and sense of energy and vitality but it is all above 2/3 of maximum scores (Table 1).

Somewhat different situation in HRQOL was found in an age group 35 to 64 years. Analysis revealed that women smokers score significantly different on all dimensions in comparison to women nonsmokers. Interestingly, this was in a favor of smokers on dimensions referring to physical functioning and general health. But

they are all in a range of high scores on a physical and social functioning so this statistical difference can not be considered clinically different. Opposite difference was found on energy/vitality and mental health where smokers scored lower. In men, there was no difference in social functioning and emotional limitations between smokers and non-smokers. In other dimensions men smokers reported slightly lower health related quality of life on dimension of vitality and mental health. At the same time they perceive general health better than non-smokers

**TABLE 1**  
DESCRIPTIVE STATISTICS FOR 8 HEALTH DIMENSIONS AND SIGNIFICANCE OF DIFFERENCE IN SCORES BETWEEN SMOKERS AND NON-SMOKERS BY GENDER FOR PARTICIPANTS FROM 18 TO 34 YEARS OLD

		Men			Women		
		Smokers	Non-smokers	p	Smokers	Non-smokers	p
Physical functioning	Mean	88.69	95.94		92.74	90.96	
	SD	24.25	11.46		15.66	18.07	
	Median	100	100	***	100	100	***
	N	227,608	246,484		180,713	299,676	
Role limitations due to physical problems	Mean	85.60	91.17		87.89	84.81	
	SD	33.77	23.99		28.79	32.18	
	Median	100	100	***	100	100	***
	N	227,816	246,484		181,611	300,382	
Pain	Mean	81.31	86.00		80.23	80.09	
	SD	24.17	21.39		24.02	24.24	
	Median	100	100	***	84	100	n.sg.
	N	227,816	245,359		180,770	299,150	
General health	Mean	73.92	74.65		73.05	72.17	
	SD	21.02	18.91		19.79	18.82	
	Median	77	77	*	77	75	***
	N	227,816	246,484		181,611	299,627	
Energy / Vitality	Mean	68.63	71.00		65.69	65.43	
	SD	18.27	18.00		18.78	17.57	
	Median	70	70	***	70	65	***
	N	227,816	246,246		181,611	299,769	
Social functioning	Mean	88.19	89.25		86.91	86.68	
	SD	20.31	17.93		20.92	18.99	
	Median	100	100	***	100	100	***
	N	227,816	246,484		181,611	300,382	
Role limitations due to emotional problems	Mean	88.99	89.55		86.47	86.96	
	SD	29.44	26.81		30.53	29.36	
	Median	100	100	***	100	100	*
	N	227,816	246,484		181,611	300,382	
Mental health	Mean	72.88	75.90		71.77	73.10	
	SD	17.02	15.91		18.37	16.01	
	Median	76	80	***	76	76	***
	N	227,816	246,246		180,887	299,415	

Mann-Whitney test; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

and report less pain. As it was already mentioned for women, both men groups are in the range of high scores on physical functioning with minimal limitations due to physical problems. For mental health and pain median and average scores are above 2/3 of maximum indicating pretty good health related quality of life having in mind that score 100 is best possible health or functioning without any limitations. Descriptive statistics and significance of difference for each health dimension for both groups by gender were shown in Table 2.

The most interesting results were found between smokers and smokers in oldest age group what can be clearly seen in figure 3 and 4. Descriptive statistics and significance of difference for each health dimension for both groups by gender were shown in table 3. As it was expected, oldest groups reported poorer HRQOL and functioning than younger participants. In this age group, for both gender, statistically significant differences was found in HRQOL between smokers and non-smokers, on all dimensions ( $p < 0.001$ , Table 3). However, completely

**TABLE 2**  
DESCRIPTIVE STATISTICS FOR 8 HEALTH DIMENSIONS AND SIGNIFICANCE OF DIFFERENCE IN SCORES BETWEEN SMOKERS AND NON-SMOKERS BY GENDER FOR PARTICIPANTS FROM 35 TO 64 YEARS OLD

		Men			Women		
		Smokers	Non-smokers	p	Smokers	Non-smokers	p
Physical functioning	Mean	79.84	77.79		79.28	75.14	
	SD	24.36	25.66		23.60	24.69	
	Median	90	90	***	90	85	***
	N	336,588	556,961		248,597	679,287	
Role limitations due to physical problems	Mean	69.41	69.89		72.45	67.65	
	SD	42.92	41.65		40.50	41.96	
	Median	100	100	***	100	100	***
	N	337,318	556,961		248,858	679,452	
Pain	Mean	71.31	68.03		68.57	66.68	
	SD	31.15	29.19		28.90	28.33	
	Median	84	70	***	72	64	***
	N	337,318	556,898		248,858	678,174	
General health	Mean	59.44	58.11		59.30	57.02	
	SD	23.50	21.19		20.07	21.04	
	Median	62	57	***	62	57	***
	N	337,318	554,922		248,858	679,612	
Energy / Vitality	Mean	58.59	60.52		54.98	56.38	
	SD	21.27	19.65		19.83	20.08	
	Median	60	60	***	55	60	***
	N	337,144	556,924		248,145	679,784	
Social functioning	Mean	78.73	79.97		78.92	78.30	
	SD	25.77	23.56		24.05	23.85	
	Median	88	88	n.sg	88	88	***
	N	337,137	557,218		248,858	678,371	
Role limitations due to emotional problems	Mean	75.44	76.02		75.21	73.99	
	SD	40.30	39.66		39.27	40.53	
	Median	100	100	n.sg	100	100	***
	N	337,318	557,441		248,858	679,197	
Mental health	Mean	65.58	65.67		64.45	65.43	
	SD	19.17	19.40		18.65	19.17	
	Median	68	68	***	68	68	***
	N	337,318	556,211		248,631	679,424	

Mann-Whitney test: \*\*\*  $p < 0.001$

**TABLE 3**  
DESCRIPTIVE STATISTICS FOR 8 HEALTH DIMENSIONS AND SIGNIFICANCE OF DIFFERENCE IN SCORES BETWEEN SMOKERS AND NON-SMOKERS BY GENDER FOR PARTICIPANTS 65 YEARS AND OLDER

		Men			Women		
		Smokers	Non-smokers	p	Smokers	Non-smokers	p
Physical functioning	Mean	52.48	58.51		53.61	46.68	
	SD	32.51	29.88		29.77	28.88	
	Median	50	60	***	50	45	***
	N	56,648	214,023		32,028	395,429	
Role limitations due to physical problems	Mean	45.46	51.91		56.00	37.28	
	SD	46.41	44.96		45.38	43.43	
	Median	25	50	***	75	0	***
	N	56,648	214,023		32,028	396,338	
Pain	Mean	58.64	62.90		62.23	51.73	
	SD	31.75	29.68		29.30	29.68	
	Median	52	62	***	61	42	***
	N	56,648	214,023		32,028	395,676	
General health	Mean	48.41	48.46		50.41	43.01	
	SD	23.56	21.65		21.78	19.49	
	Median	45	50	***	50	42	***
	N	56,648	214,023		32,028	396,501	
Energy / Vitality	Mean	47.80	52.43		49.40	42.38	
	SD	24.38	22.50		23.04	22.23	
	Median	50	55	***	45	40	***
	N	56,648	213,885		32,028	396,501	
Social functioning	Mean	65.05	69.75		73.87	61.06	
	SD	28.15	27.60		28.06	29.03	
	Median	63	75	***	88	63	***
	N	56,648	214,023		31,906	396,239	
Role limitations due to emotional problems	Mean	59.22	67.07		66.22	54.72	
	SD	46.98	42.99		42.61	47.11	
	Median	100	100	***	100	67	***
	N	56,648	214,023		32,028	396,501	
Mental health	Mean	58.98	61.71		63.16	54.86	
	SD	22.56	19.80		21.43	20.80	
	Median	64	64	***	68	56	***
	N	56,648	214,023		32,028	395,517	

Mann-Whitney test: \*\*\*  $p < 0.001$

opposite pattern of women's and men's health profile was found in oldest groups. While in men 65 years and older non-smokers reports better health on all dimensions (Figure 1), in same age group women smokers have better HRQOL than non-smokers on all 8 dimensions (Table 3). Considering that score 100 is the best health or functioning, women smokers 65 years of age and over score notably high on social and mental health dimensions. The most prominent gap was obvious in role limitation due to physical problems where 50% of women non-smokers reported maximal limitations (median = 0)

in comparison to smokers with median score = 75 (Figure 2). Detailed insight in data revealed that as much as 75% of them scored 100 on social functioning and limitation due to emotional problems (100 means best functioning i.e. total absence of limitations).

## Discussion

Specific tools that evaluate health results – such as HRQL scales for measuring perceptions of health – are

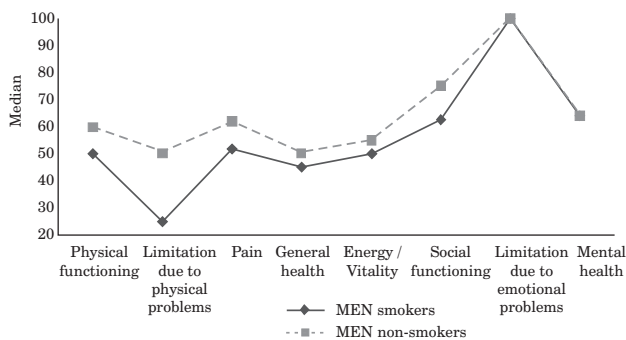


Fig. 1. Health profiles for men smokers and non-smokers, 65 years and older

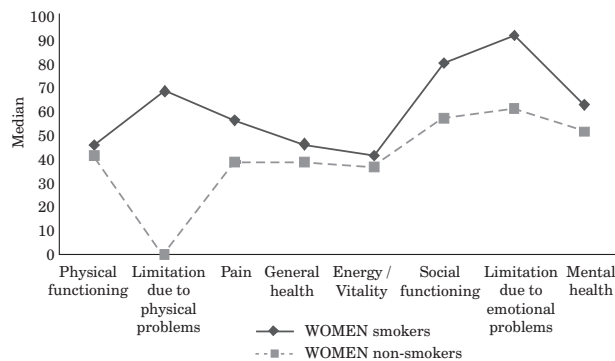


Fig. 2. Health profiles for women smokers and non-smokers 65 years and older

valid measures of the mental, physical and social impact of smoking<sup>23</sup>. Although many smokers have no evident health problems, smoking anyway reflects on their life and perceptions of health. That justifies an appraisal of HRQL in smokers, same as in other papers<sup>24</sup>.

Results indicated that there were significant differences in self-assessed HRQOL between smokers and non-smokers even in a young adult age when there is no difference in objective health status (for example diagnosed disease). Comparing the overall results for our population of smokers and non-smokers, we must consider there are some other factors with potential impact on HRQOL that we didn't include in analysis. For example, it was found that people, who were physically active at recommended levels, were more likely to report high physical function regardless of smoking<sup>25</sup>.

As it was expected, health decreases with the age, for both groups, but direction of difference between smokers and non-smokers varied for different health dimensions across the age groups.

Some smoking-related chronic or acute diseases occur in our population and probably have impact on here presented results. As it was previously found in Croatian population, health related quality of life depends on age and gender, not only smoking habit<sup>26</sup>. In this research, we explore the data for men and women separately according to age group. In the youngest age group (18–34) women smokers reported to experience more pain than non-smokers, but they assess their general health better and they feel more vital than non-smokers. As it was mentioned earlier, negative effects of smoking takes time to be recognized by the individual. Other researchers found that smokers tend to become alert to the symptoms associated with long-term smoking in the fourth decade of life<sup>24</sup>. However, in our study, women smokers 35–64 years of age, reported better physical functioning, less physical pain, and assess their general health better than non-smokers. Women smokers, in that age group, feel less vital than non-smokers. Unexpected result was found for women smokers in age group 65+ who have better health related quality of life than women non-smokers on all eight dimensions. This finding opens the area for future analysis and research where more vari-

ables on objective health should be taken in account in order to explain such a results. Although explanation of such a finding is beyond this paper, it is supposed that psychological variables (for example positive and negative affect, health locus of control, etc.) have an important role, and need to be considered in future in order to make a clear conclusion.

Men smokers, in the youngest age group (18–34), assess their mental health worse than non-smokers, what was similar to findings from other researches<sup>24</sup>. Other researchers have found that current smokers had consistently poorer mental health than non-smokers<sup>27</sup>. And it was observed that a history of depression, low self-esteem, and a predisposition to the adoption of an unhealthy lifestyle are associated with smoking initiation<sup>28</sup>. Knowing this, our finding is of public health concern, since difference in self-perceived mental health is already evident in younger men. Casual relationship of psychological functioning and smoking initiation need to be examined in further researches. In the age group 35–64 men smokers have less physical pain and they assess their general health better than non-smokers. That was opposite to some other published results, where current smokers report lower functional status than nonsmokers, in physical and especially in mental health domains<sup>29</sup>. In our study, men smokers in age group 65+ have worse health related quality of life than men non-smokers, on following six domains: physical functioning, physical limitations, pain, general health, energy/vitality, and social functioning. Those results are similar to other researches which show that men smokers had poorer general health and physical functioning<sup>27</sup>. In this age cumulative negative effects of smoking on health become evident. As they are predominantly life long smokers, this finding was unfortunately expected. So it is very important that our public health efforts – programs and legislations, target younger population.

There are some limitations of this study. All data reported in this study are self-reported and are subjective measures by its nature. However, our intention was to assess people's perception of their health and HRQOL. Subjective perception of health and functioning does not need to be equal to person's objective state of health, so

including some additional objective measures will be advantage. Many other factors, for example education, income, marital status, and the socio-cultural acceptability of smoking, have an impact on the quality of life, so need to be considered in future research.

## Conclusion

Results indicated that there was evident difference in HRQOL between smokers and non-smokers even in a young adult age when there is no difference in objective health status (for example diagnosed disease). As we found significant differences according to gender by age

groups, we suggest that it is essential for future studies to take those characteristics into consideration. The existing differences in mental health and social functioning should be acknowledged in planning prevention programs. The strengthening of self-confidence and social integration are recommendable for prevention programs in order to prevent early development of smoking habits.

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## KVALITETA ŽIVOTA U ODNOSU NA ZDRAVLJE PUŠAČA U HRVATSKOJ

### SAŽETAK

Svrha ovog istraživanja bila je istražiti kvalitetu života u odnosu na zdravlje pušača i nepušača uzimajući u obzir spol i dob. Podaci su prikupljeni Hrvatskom zdravstvenom anketom iz 2003. godine. Istraživanjem je obuhvaćeno 9070 ispitanika od čega je bilo 68,1% žena i 31,9% muškaraca u dobi od 19 do 101 godine. Rezultati su pokazali da postoji značajna razlika između pušača i nepušača u kvaliteti života vezanoj za zdravlje, čak i u mlađoj dobnoj skupini u kojoj nema razlike u objektivnom zdravstvenom statusu (npr. dijagnosticirane bolesti). Zdravlje obiju skupina se u pravilu pogoršava s dobi, ali smjer razlike u funkcioniranju i kvaliteti života između pušača i nepušača različit je u različitim dobnoj skupinama i za različite dimenzijama. Najizrazitija razlika u kvaliteti života vezanoj za zdravlje je nađena u dobnoj skupini ispitanika od 65 godina i više gdje žene pušači pokazuju bolju kvalitetu života u odnosu na žene nepušače, dok je u muškaraca razlika suprotnog smjera, pušači imaju lošiju kvalitetu života u odnosu na nepušače. Dobiveni

nalazi razlikuju za različite dobne skupine i po spolu, što ukazuje na potrebu uvažavanja navedenih obilježja u budućim istraživanjima. Utvrđena razlika u mentalnom zdravlju i socijalnom funkcioniranju pušača i nepušača treba biti uzeta u obzir u planiranju preventivnih programa. Također je važno naglasiti za buduća istraživanja da mnogi drugi čimbenici kao što su to edukacija, ekonomski status, bračni status ali i socio-kulturalna prihvaćenost pušenja mogu imati utjecaj na kvalitetu života vezani za zdravlje.