

# The impact of respiratory symptoms presence on quality of life of tobacco smokers

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## ABSTRACT

**Introduction:** Quality of life is a broad term that refers to the total well-being of the individual in terms of physical, psychological, emotional, mental, and social well-being, and which is in turn influenced by numerous factors including age, gender, socioeconomic status, risk factors in behavior, the environment, and the absence or presence of disease.

**Goal:** The goal was to determine the presence of respiratory symptoms in smokers and to compare them with non-smokers as well as determine the relationship between quality of life with the frequency of respiratory symptoms from the aspect of gender, age, the environment in which they live, and the total monthly income of smokers compared to non-smokers.

**Material and Methods:** The study was conducted on a sample of 600 subjects who were divided into two groups. The first group consisted of regular smokers (300 subjects) and the second group consisted of non-smokers. Former smokers were not included in the study.

The survey questionnaire was designed on the basis of the following.

- A questionnaire to test the quality of life SF-36;
- Inventory of socioeconomic status EuroQoL;
- Basic respiratory symptoms were examined by MRC questionnaire (consisting of 9 questions).

**Results:** The presence of respiratory symptoms was not associated with gender and the area of origin of the respondents, while the level of education, age, total monthly household income, and smoking status were directly related to the presence of respiratory symptoms, so that respondents with lower education levels, older ones, those with lower incomes, and smokers have more pronounced symptoms of respiratory problems. There is large negative impact of respiratory symptoms presence on respondent's quality of life.

**Conclusion:** Smoking status were directly related to the presence of respiratory symptoms. There is large negative impact of respiratory symptoms presence on respondent's quality of life.

**Key words:** Quality of life, respiratory symptoms, tobacco smoking

## INTRODUCTION

Quality of life is a very complex term and its definition depends on who it has been theorized, who defines it.

Some people interpret that this term implies the ability to perform social and personal tasks appropriate to the age, sex, intelligence, and being part of a particular social class. Others under the quality of life think about the individual perception of their own well-being or lack of that perception,<sup>[1,2]</sup>

Its definition depends on many factors: material, physical, safety, social, health, and others. Economists estimate the quality of life based on economic standards by the distribution of social income. For

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ecologists, quality of life depends on the preservation of the natural environment. Sociologists explain the quality of life as a good understanding of different groups of people. Theologians, however, imply that only the quality life is the one that does not deny the metaphysical source.<sup>[1,3,4]</sup>

Doctors believe that the quality life is one with preserved health, and as we know, "health is not just the absence of disease and exhaustion, but a state of complete physical, mental, and social well-being."<sup>[5]</sup>

Assessment of quality of life associated with health (HRQOL) is equally important both to medical professionals and patients. For most chronic patients as well as conditions including chronic pain, besides the classic clinical indicators, more and more is significant to obtain information from the patient.<sup>[1]</sup> Smoking tobacco is associated with the emergence of large number of respiratory diseases that carry the accompanying respiratory symptoms that can greatly affect the quality of life of the smoker.

### Goal

The goal was to determine the presence of respiratory symptoms in smokers and to compare them with non-smokers as well as determine the relationship between quality of life with the frequency of respiratory symptoms from the aspect of gender, age, the environment in which they live and the total monthly income of smokers compared to non-smokers.

## MATERIALS AND METHODS

The study was conducted on a sample of 600 subjects who were divided into two groups.

The first group consists of regular smokers (300 subjects) and the second group consists of non-smokers. Former smokers were not included in the study.

The study included both genders equally, and both groups of respondents were further distributed into age groups: 19-34 years, 35-49 years, 50-64 years, and from 65-70 years. In each age group were equally distributed 75 smokers and 75 non-smokers. There was a tendency toward more equitable distribution of respondents according to their place of residence in relation to rural and urban areas.

The study used a questionnaire designed for research purposes provided for a self-answering. The survey questionnaire was designed on the basis of:

- A questionnaire to test the quality of life SF-36;

- Inventory of socioeconomic status EuroQoL;
- Basic respiratory symptoms were examined by MRC questionnaire (consisting of 9 questions).

SF-36 questionnaire was developed in the USA in the late 80s of the last century as part of the MOS (Medical Outcomes Study) which was longitudinal study for self-assessment of health status of patients with various chronic conditions.<sup>[6]</sup>

The questionnaire provides acceptable, psychometrically appropriate, and efficient way of measuring quality of life from the patient's perspective through questions and answers on standardized questionnaire.<sup>[6]</sup>

The SF-36 is designed to measure eight dimensions of the most important health issues using the 8 groups of questions. Groups consist of 2-10 questions with provided answers for each question, which are subsequently processed in standard manner. SF-36 questionnaire has 36 questions, of which 35 questions are grouped into 8 dimensions:

- Physical functioning
- Physical role
- Bodily pain
- General health
- Vitality
- Social functioning
- Emotional role
- Mental health

## RESULTS

According to expectations, smokers had higher number of respiratory problems ( $2.2967 \pm 2.58$ ) compared with non-smokers ( $1.4414 \pm 2.01$ ) with statistically significant differences evident between groups of smokers and non-smokers [Table 1].

Analysis of the presence of respiratory symptoms among the respondents in rural areas shows that there are more non-smokers without any respiratory symptoms (49.5%) than smokers (44.0%), and that the difference in the number of symptoms is statistically significant [Table 2].

In urban areas, the difference in the number of respondents without respiratory symptoms was much higher in the non-smoking group (46.5%) compared to the group of smokers (27.5%) with evident statistical significance of observed differences between the groups. Also, analysis of the average number of symptoms shows a statistical significant

**Table 1: Respiratory symptoms in relation to the smoking status of respondents**

	Number of respiratory problems		
	Smoker		Total
	Yes	No	
0			
<i>N</i>	99	142	241
%	33.0	47.5	40.2
1			
<i>N</i>	57	54	111
%	19.0	18.1	18.5
2			
<i>N</i>	36	32	68
%	12.0	10.7	11.4
3			
<i>N</i>	33	37	70
%	11.0	12.4	11.7
4			
<i>N</i>	21	9	30
%	7.0	3.0	5.0
5			
<i>N</i>	11	11	22
%	3.7	3.7	3.7
6			
<i>N</i>	13	3	16
%	4.3	1.0	2.7
7			
<i>N</i>	7	1	8
%	2.3	0.3	1.3
8			
<i>N</i>	12	4	16
%	4.0	1.3	2.7
9			
<i>N</i>	11	6	17
%	3.7	2.0	2.8
Total %			
<i>N</i>	300	299	599
%	100.0	100.0	100.0

$\chi^2=29.236$   $P=0.001$

difference with the increasing number of respiratory symptoms ( $2.42 \pm 2.61$ ) in the group of smoker compared to the non-smoker group ( $1.44 \pm 1.88$ ) [Table 3].

Correlation of respiratory symptoms according to the dimensions of quality of life in the total sample showed a statistically significant negative correlation with all the observed dimensions. The correlation coefficient varies in the area of weakly expressed negative interdependence [Table 4].

Correlation analysis of respiratory symptoms and scores of individual dimensions of quality of life of respondents according to the community where they live clearly shows that this interdependence

**Table 2: The presence of respiratory symptoms in relation to the smoking status of respondents in rural areas**

	Number of respiratory problems		
	Smoker		Total
	Yes	No	
0			
<i>N</i>	44	49	93
%	44.0	49.5	46.7
1			
<i>N</i>	11	18	29
%	11.0	18.2	14.6
2			
<i>N</i>	10	13	23
%	10.0	13.1	11.6
3			
<i>N</i>	12	8	20
%	12.0	8.1	10.1
4			
<i>N</i>	6	4	10
%	6.0	4.0	5.0
5			
<i>N</i>	4	1	5
%	4.0	1.0	2.5
6			
<i>N</i>	5	0	5
%	5.0	0.0	2.5
7			
<i>N</i>	2	0	2
%	2.0	0.0	1.0
8			
<i>N</i>	4	0	4
%	4.0	0.0	2.0
9			
<i>N</i>	2	6	8
%	2.0	6.1	4.0
Total %			
<i>N</i>	100	99	199
%	100.0	100.0	100.0

$\chi^2=18.345$   $P=0.031$

was higher in patients of rural areas. Accordingly, a negative significant correlation was found in the rural group by the general health dimension ( $-0.563$ ), and weakly expressed negative interdependency in the urban group of respondents to the dimension of social functioning ( $-0.188$ ) [Table 5].

Correlation analysis of respiratory symptoms and scores of individual dimensions of quality of life of respondents according to smoking status clearly shows that this interdependence was slightly higher in smokers than in non-smokers. Accordingly, a negative significant correlation was found in the group of smokers by the dimension of physical functioning ( $-0.512$ ) and weakly expressed negative

**Table 3: The presence of respiratory symptoms in relation to the smoking status of respondents in urban areas**

	Number of respiratory problems		
	Smoker		Total
	Yes	No	
0			
<i>N</i>	55	93	148
%	27.5	46.5	37.0
1			
<i>N</i>	46	36	82
%	23.0	18.0	20.5
2			
<i>N</i>	26	19	45
%	13.0	9.5	11.3
3			
<i>N</i>	21	29	50
%	10.5	14.5	12.5
4			
<i>N</i>	15	5	20
%	7.5	2.5	5.0
5			
<i>N</i>	7	10	17
%	3.5	5.0	4.3
6			
<i>N</i>	8	3	11
%	4.0	1.5	2.8
7			
<i>N</i>	5	1	6
%	2.5	.5	1.5
8			
<i>N</i>	8	4	12
%	4.0	2.0	3.0
9			
<i>N</i>	9	0	9
%	4.5	0	2.3
Total %			
<i>N</i>	200	200	400
%	100.0	100.0	100.0

$\chi^2=34.147$   $P=0.000$

interdependence in a group of non-smokers to the dimension of social functioning (-0.294) [Table 6].

Influence of respiratory symptoms on the dimensions of quality of life varies according to age groups in both rural and urban areas. In rural areas, there is a statistically significant difference in the coefficient of correlation by age groups and dimensions of quality of life, except in the age group 35-49 years, and except for the dimensions of bodily pain in the age group 50-60 years [Table 7].

In urban areas, there is not so pronounced statistically significant difference in the coefficient of correlation by age groups and dimensions of quality of life of respondents like in rural areas.

**Table 4 : Correlation of the existence of respiratory symptoms and respondents quality of life**

Correlations	
Number of present respiratory problems	
Physical functioning	
Ro	-0.454 (**)
<i>P</i>	0.000
<i>N</i>	599
Physical role	
Ro	-0.418 (**)
<i>P</i>	0.000
<i>N</i>	599
Emotional role	
Ro	-0.407 (**)
<i>P</i>	0.000
<i>N</i>	599
Vitality	
Ro	-0.382 (**)
<i>P</i>	0.000
<i>N</i>	599
Mental health	
Ro	-0.325 (**)
<i>P</i>	0.000
<i>N</i>	598
Social functioning	
Ro	-0.315 (**)
<i>P</i>	0.000
<i>N</i>	599
Bodily pain	
Ro	-0.333 (**)
<i>P</i>	0.000
<i>N</i>	599
General health	
Ro	-0.443 (**)
<i>P</i>	0.000
<i>N</i>	599

$P=0.000$

Influence of respiratory symptoms on the dimensions of quality of life partly varies by monthly household income both in rural and urban areas. In rural areas, there is no statistically significant difference in the coefficient of correlation in the groups with income of more than 1500 KM in the domain of the emotional role and mental health, while in urban area there is no statistically significant difference in the coefficient of correlation between the groups with income over 1500 KM in the domain of vitality and mental health [Table 8].

Analysis of correlation between effects of respiratory symptoms on dimensions of quality of life in relation to the age group of smokers and non-smokers showed that among smokers the number of respiratory symptoms had a greater effect in younger categories of smokers on the physical role, emotional role, mental health, bodily pain, and general health, and

**Table 5 : Correlation of the respiratory symptoms existence and respondents quality of life according to their environment**

	Correlations	
	Rural	Urban
Physical functioning		
Ro	-0.588 (**)	-0.377 (**)
P	0.000	0.000
N	199	400
Physical role		
Ro	-0.522 (**)	-0.358 (**)
P	0.000	0.000
N	199	400
Emotional role		
Ro	-0.546 (**)	-0.325 (**)
P	0.000	0.000
N	199	400
Vitality		
Ro	-0.538 (**)	-0.282 (**)
P	0.000	0.000
N	199	400
Mental health		
Ro	-0.485 (**)	-0.231 (**)
P	0.000	0.000
N	199	399
Social functioning		
Ro	-0.502 (**)	-0.188 (**)
P	0.000	0.000
N	199	400
Bodily pain		
Ro	-0.513 (**)	-0.225 (**)
P	0.000	0.000
N	199	400
General health		
Ro	-0.563 (**)	-0.383 (**)
P	0.000	0.000
N	199	400

P=0.000

**Table 6: Correlation of the existence of respiratory symptoms and respondents quality of life according to smoking status**

	Correlations	
	Smoker	Non-smoker
Physical functioning		
Ro	-0.512 (**)	-0.431 (**)
P	0.000	0.000
N	299	300
Physical role		
Ro	-0.463 (**)	-0.399 (**)
P	0.000	0.000
N	299	300
Emotional role		
Ro	-0.415 (**)	-0.395 (**)
P	0.000	0.000
N	299	300
Vitality		
Ro	-0.408 (**)	-0.370 (**)
P	0.000	0.000
N	299	300
Mental health		
Ro	-0.354 (**)	-0.298 (**)
P	0.000	0.000
N	299	299
Social functioning		
Ro	-0.341 (**)	-0.294 (**)
P	0.000	0.000
N	299	300
Bodily pain		
Ro	-0.370 (**)	-0.321 (**)
P	0.000	0.000
N	299	300
General health		
Ro	-0.478 (**)	-0.419 (**)
P	0.000	0.000
N	299	300

P=0.000

in categories of older smokers on physical functioning, vitality and social functioning.

In non-smokers, the impact of respiratory symptoms was more pronounced in younger categories on physical functioning, mental health, social functioning, and bodily pain, and among the older on the physical role, emotional role, vitality, and general health, which may explain the subsequent development of respiratory symptoms in this group [Table 9].

## DISCUSSION

The potential harmful effects of smoking tobacco was considered as early as 1859 when the analysis of 68 patients with changes in the oral cavity was done and of which 66 patients had smoked tobacco using a

short clay pipe. Then begin significant studies on the harmful effects of tobacco smoking, which have been of epidemiological character. In 1962, Royal College in London has estimated that smoking poses a serious threat to health and only a few years later, Chief of the Office of State Public Health gave support to this hypothesis.<sup>[7]</sup>

Today it is known that the incidence of diseases related to tobacco smoking is proportionately greater in younger than older smokers, especially for coronary arteries diseases and stroke. However, the absolute level of mortality increases with age in smokers compared to non-smokers. Organ damage related to smoking and increased mortality of smokers were higher in the older population, as would be expected during the process of cumulative damage caused by smoking.<sup>[8]</sup>

**Table 7: Correlation between the existence of respiratory symptoms and quality of life of respondents with respect to the area of origin and the age**

	Correlations							
	Rural				Urban			
	19-34 years	35-49 years	50-64 years	65-70 years	19-34 years	35-49 years	50-64 years	65-70 years
Physical functioning								
Ro	-0.433 (**)	-0.026	-0.608 (**)	-0.446 (**)	-0.338 (**)	-0.343 (**)	-0.311 (**)	-0.140
P	0.002	0.860	0.000	0.001	0.001	0.000	0.002	0.166
N	50	49	50	50	100	100	100	100
Physical role								
Ro	-0.362 (**)	-0.029	-0.515 (**)	-0.350 (*)	-0.340 (**)	-0.291 (**)	-0.238 (*)	-0.263 (**)
P	0.010	0.844	0.000	0.013	0.001	0.003	0.017	0.008
N	50	49	50	50	100	100	100	100
Emotional role								
Ro	-0.635 (**)	-0.075	-0.350 (*)	-0.386 (**)	-0.218 (*)	-0.445 (**)	-0.189	-0.322 (**)
P	0.000	0.607	0.013	0.006	0.030	0.000	0.060	0.001
N	50	49	50	50	100	100	100	100
Vitality								
Ro	-0.514 (**)	-0.255	-0.472 (**)	-0.448 (**)	-0.192	-0.266 (**)	-0.250 (*)	-0.295 (**)
P	0.000	0.077	0.001	0.001	0.056	0.008	0.012	0.003
N	50	49	50	50	100	100	100	100
Mental health								
Ro	-0.583 (**)	-0.160	-0.412 (**)	-0.322 (*)	-0.310 (**)	-0.261 (**)	-0.228 (*)	-0.178
P	0.000	0.274	0.003	0.022	0.002	0.009	0.023	0.076
N	50	49	50	50	100	100	99	100
Social functioning								
Ro	-0.487 (**)	-0.047	-0.407 (**)	-0.306 (*)	-0.291 (**)	-0.169	-0.182	0.026
P	0.000	0.748	0.003	0.031	0.003	0.092	0.070	0.795
N	50	49	50	50	100	100	100	100
Bodily pain								
Ro	-0.494 (**)	-0.120	-0.259	-0.430 (**)	-0.360 (**)	-0.051	-0.226 (*)	-0.128
P	0.000	0.412	0.069	0.002	0.000	0.614	0.024	0.205
N	50	49	50	50	100	100	100	100
General health								
Ro	-0.332 (*)	-0.281	-0.554 (**)	-0.487 (**)	-0.380 (**)	-0.138	-0.272 (**)	-0.365 (**)
P	0.019	0.051	0.000	0.000	0.000	0.170	0.006	0.000
N	50	49	50	50	100	100	100	100

In 10-15% of patients with chronic obstructive pulmonary disease (COPD) occurs permanent changes that lead to remodeling and the restricted flow of air through the airways. Smoking cessation in these patients does not lead to significant improvement of lung function, but in any case slows deterioration, while continued smoking leads to lung fibrosis.<sup>[9]</sup>

Since the early 20<sup>th</sup> century, when it was a rare disease, lung cancer has become the most common types of cancer with a high morbidity rate worldwide. Correlation between lung cancer and cigarette smoking were published after a well-conducted study of 1950s of the 20<sup>th</sup> century and was later confirmed in large population, prospective cohort studies.<sup>[10]</sup> For most developed countries, it was found that in 90% of cases of lung cancer can be associated with smoking.

Smoking tobacco is recognized as a predisposing factor for respiratory diseases in both men and women, with most studies recognize the age group older than 45 years as most vulnerable.<sup>[11]</sup> A study that examined differences in the frequency of symptoms of respiratory diseases among smokers and non-smokers show significant differences but no comparisons were made with the ultimate effect – the quality of life.<sup>[12]</sup>

In the study performed in Great Britain on sample of 8215 respondents in which were equally represented smokers and non-smokers with similar socioeconomic characteristics was found that 13.3% have COPD. It was found that 34.9% of current smokers have this type of disease, 15.2% former smokers, and 8.2% non-smokers. Differences observed in relation to smoking were statistically significant.<sup>[13]</sup>

**Table 8: Correlation between the existence of respiratory symptoms and quality of life of respondents according to their area of origin and their monthly income**

Correlations	Rural			Urban		
	<500 KM	500-1500 KM	>1500	<500 KM	500-1500 KM	>1500
Physical functioning						
Ro	-0.678 (**)	-0.572 (**)	-0.471 (**)	-0.278 (*)	-0.366 (**)	-0.377 (**)
P	0.000	0.000	0.001	0.030	0.000	0.000
N	54	97	48	61	251	88
Physical role						
Ro	-0.544 (**)	-0.539 (**)	-0.445 (**)	-0.365 (**)	-0.314 (**)	-0.405 (**)
P	0.000	0.000	0.002	0.004	0.000	0.000
N	54	97	48	61	251	88
Emotional role						
Ro	-0.628 (**)	-0.600 (**)	-0.164	-0.279 (*)	-0.348 (**)	-0.172
P	0.000	0.000	0.265	0.029	0.000	0.110
N	54	97	48	61	251	88
Vitality						
Ro	-0.559 (**)	-0.564 (**)	-0.400 (**)	-0.431 (**)	-0.253 (**)	-0.070
P	0.000	0.000	0.005	0.001	0.000	0.518
N	54	97	48	61	251	88
Mental health						
Ro	-0.501 (**)	-0.528 (**)	-0.236	-0.330 (**)	-0.179 (**)	-0.200
P	0.000	0.000	0.106	0.009	0.005	0.061
N	54	97	48	61	250	88
Social functioning						
Ro	-0.568 (**)	-0.517 (**)	-0.354 (*)	0.019	-0.206 (**)	-0.243 (*)
P	0.000	0.000	0.014	0.885	0.001	0.023
N	54	97	48	61	251	88
Bodily pain						
Ro	-0.558 (**)	-0.552 (**)	-0.297 (*)	-0.275 (**)	-0.169 (**)	-0.267 (*)
P	0.000	0.000	0.040	0.010	0.007	0.038
N	54	97	48	61	251	88
General health						
Ro	-0.574 (**)	-0.592 (**)	-0.541 (**)	-0.321 (**)	-0.308 (**)	-0.522 (**)
P	0.000	0.000	0.000	0.002	0.000	0.000
N	54	97	48	88	251	61

The studies show that men, people who perform manual labor and people with lower socioeconomic status, are more likely to develop COPD, and the same when smokers have twice the chance for manifestations of obstructive disease.<sup>[13,14]</sup>

In our study, the by distribution of symptoms of respiratory disease in the total sample in relation to the environment from which the respondents originate it can be seen that there is no significant difference in relation to the environment as well as in relation to gender. In smokers, there is significantly higher prevalence of respiratory symptoms in relation to non-smokers, both in rural and urban areas. The study demonstrated a statistically significant difference in the distribution of symptoms of respiratory diseases in patients with different levels of education. Respondents who have lower

levels of education have a greater number of these symptoms (problems) from which we conclude that more educated people take care of their respiratory health and is more likely to contact the doctor at the sign of first symptoms.

Our research has shown that there is a correlation between the number of symptoms of respiratory diseases and age in the sense that with increasing age increases the number of symptoms as confirmed in Tillman's study.<sup>[12]</sup>

The economic factor is of great influence on the occurrence of greater number of respiratory symptoms that can be seen by the resulting highly significant differences between groups with low and high incomes. Similar results were shown by Tillman's study.<sup>[12]</sup> Analysis of correlations between

**Table 9: Correlation between the existence of respiratory symptoms and quality of life of respondents according to their smoking status and age groups**

	Correlations							
	Smoker				Non-smoker			
	19-34 years	35-49 years	50-64 years	65-70 years	19-34 years	35-49 years	50-64 years	65-70 years
Physical functioning								
Ro	-0.408	-0.188	-0.435	-0.258	-0.186	-0.351	-0.425	-0.320
P	0.000	0.105	0.000	0.026	0.109	0.002	0.000	0.005
N	75	75	75	75	75	74	75	75
Physical role								
Ro	-0.416	-0.227	-0.331	-0.264	-0.219	-0.273	-0.340	-0.378
P	0.000	0.050	0.004	0.022	0.060	0.019	0.003	0.001
N	75	75	75	75	75	74	75	75
Emotional role								
Ro	-0.353	-0.346	-0.294	-0.326	-0.358	-0.363	-0.204	-0.375
P	0.002	0.002	0.011	0.004	0.002	0.001	0.079	0.001
N	75	75	75	75	75	74	75	75
Vitality								
Ro	-0.268	-0.225	-0.390	-0.317	-0.378	-0.252	-0.344	-0.394
P	0.020	0.052	0.001	0.006	0.001	0.030	0.003	0.000
N	75	75	75	75	75	74	75	75
Mental health								
Ro	-0.444	-0.113	-0.339	-0.164	-0.372	-0.290	-0.262	-0.328
P	0.000	0.335	0.003	0.159	0.001	0.012	0.023	0.004
N	75	75	74	75	75	74	75	75
Social functioning								
Ro	-0.280	-0.104	-0.354	-0.039	-0.475	-0.220	-0.184	-0.202
P	0.015	0.376	0.002	0.739	0.000	0.060	0.115	0.082
N	75	75	75	75	75	74	75	75
Bodily pain								
Ro	-0.375	0.024	-0.351	-0.264	-0.424	-0.216	-0.173	-0.289
P	0.001	0.836	0.002	0.022	0.000	0.064	0.137	0.012
N	75	75	75	75	75	74	75	75
General health								
Ro	-0.361	-0.251	-0.283	-0.347	-0.228	-0.073	-0.478	-0.476
P	0.001	0.030	0.014	0.002	0.049	0.537	0.000	0.000
N	75	75	75	75	75	74	75	75

the number of respiratory illnesses and quality of life of the individual subscales scores in terms of total household income shows in the rural area already seen pattern that represents with lower financial status have greater influence of respiratory symptoms on all dimensions of functioning. In the case of urban areas, this rule does not apply, so we find a larger impact of respiratory symptoms in a better financial situation to physical functioning, physical role, mental health, and social functioning.

Analysis of the association of respiratory symptoms and individual subscales scores of quality of life by the area where they live clearly shows that this effect was greater in patients from rural areas. Otherwise, it was demonstrated statistically significant negative effect of the presence of respiratory symptoms on all dimensions of quality of life.

Analysis of the association of respiratory symptoms and individual subscales scores of the quality of life according to area and sex shows that this effect varies with the functioning scales and the environment in which respondents live.

Both in the group of smokers and non-smokers, an increase in the number of respiratory symptoms was negatively associated with individual dimensions of quality of life provided that both in rural and urban areas the group of smokers have higher correlation of respiratory symptoms according to the functioning scales.

Most of the studies show that there is a significant relationship between age and the symptoms of chronic obstructive pulmonary disease, which is especially pronounced among former and current smokers. Most



of the available studies show that almost half of smokers aged 65 years have increased number of respiratory symptoms in favor of the existence of COPD.<sup>[13,14]</sup>

Influence of respiratory symptoms number on quality of life scales varies in relation to age in both rural and urban areas. In rural areas, there is no statistically significant correlation in the middle age group (35-49 years) while the correlation is higher in the younger group by emotional role, vitality, mental health, social functioning and bodily pain and higher in the older respondents by physical functioning, physical role, and general health. In urban areas, the impact of respiratory symptoms number was more pronounced in younger in relation to physical functioning, physical role, emotional role, mental health and bodily pain, and among older on the vitality, social functioning, and general health.

Studies that assess association of psychological disorders in patients with symptoms of COPD demonstrate that there is a high possibility of occurrence of these symptoms in people who have expressed respiratory problems, while the highest correlation was observed in the case of dyspnea. Factors such as cigarette smoking, dyspnea, physical inactivity, social isolation, and age are associated with the scale of psychological health as observed in our study.

## CONCLUSION

The presence of respiratory symptoms was not associated with gender and the area of origin of the respondents, while the level of education, age, total monthly household income, and smoking status were directly related to the presence of respiratory symptoms, so that respondents with lower education levels, older ones, those with lower incomes, and smokers have more pronounced symptoms of respiratory problems. There is large negative impact of respiratory symptoms presence on respondent's quality of life.

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