

## ORIGINAL ARTICLE

## STUDY OF RELATIONSHIP OF PSYCHOSOCIAL FACTORS WITH SMOKING IN NORTHERN POPULATION

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### ABSTRACT

**The aim:** Of our study was to identify the relationship between the main risk factors for heart disease and social factors among northern population.

**Materials and methods:** We polled 3092 native and non-native habitants of the Sakha Republic (Yakutia). The poll consists of several sections. It includes questions related to social, demographic and life record data, heredity, physical activity and unhealthy habits.

**Results:** Among the people diagnosed with hypertension (HT), there are more smokers than among the people without this medical condition. On the contrary, in the group of people diagnosed with HT at the examination for taking blood pressure, there were fewer smokers than in the group, in which HT was not registered. Patients with CHD, Myocardial infarction (MI) in past medical history, cerebrovascular accident (CVA) and type 2 diabetes (T2D), are smokers to the same degree as the other group. This indicates that this category of the examined are exposed to the risk of cardiovascular aggravations. We determined a high spread of psychosocial risk factors for the examined respondents – the relationship between smoking, overweight, obesity, abdominal obesity and HT, and the level of education, marital status and labor specificity. The increase in the level of education is associated with fewer amounts of smokers among both non-native and native habitants. Overweight is more frequently observed for the people who are not single, have low level of education and are engaged in manual labor. In particular, it is applicable to native habitants.

**Conclusions:** Abdominal obesity did not have any relationship with psychosocial factors for native habitants. However, in relation to non-native habitants, overweight, obesity, abdominal obesity and HT are associated with marital status (married) and with manual labor.

**KEY WORDS:** smoking, risk factors, psychosocial risk

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### INTRODUCTION

Smoking is commonly recognized as a reason for development of various diseases. It is a cause of deaths for 50% of smokers (half of whom die from cardiovascular diseases), which could have been avoided. Such aspects of lifestyle as smoking and psychosocial factors lead to cardiovascular diseases [1]. Many countries consider that this problem results in premature mortality and increased costs of healthcare system, which damages social and economic spheres.

Regardless of decrease observed in smoking tendency in Europe, it is still a common phenomenon among people with low level of education. Level of education determines the difference in the amount of people who give up smoking in many European countries [2].

Smoking-related risk primarily depends on the number of cigarettes smoked per day, taking into consideration an obvious dose-addiction effect. At the same time, there is no lower limit with the absence of negative effect [3].

The accumulated data indicates the increase of coronary heart disease (CHD) risk for passive smokers to a greater extent than it was expected [4, 5]. Cardiovascular disease (CVD) risk increases by about 30% for a non-smoker person living with a smoker partner [6, 7], or for an employee who inhales cigarette smoke at the workplace [8, 9].

### THE AIM

The aim of our study was to identify the relationship between the main risk factors for heart disease and social factors among northern population.

### MATERIALS AND METHODS

We polled 3092 native and non-native habitants of the Sakha Republic (Yakutia). The poll consists of several sections. It includes questions related to social, demographic and life record data, heredity, physical activity and unhealthy habits. A regular smoker shall be considered a person who has been smoking at least one cigarette per day for the last 12 months.

Social status was estimated using standard questionnaire. We estimated such parameters as education level and marital status.

In accordance with level of education we divided the examined into four groups:

Group 1: people with primary (or lower) level of education.

Group 2: people with vocational education.

Group 3: people with secondary education.

Group 4: people with a degree.

In accordance with marital status we divided the examined into 4 groups:

**Table I.** Smoking rate for native population of the Sakha Republic (Yakutia).

Age groups	All	Men	Women	P
All	37.4	52.6	31.9	<0.001
Age 18–59 (1)	42.3	57.8	36.6	<0.001
Age 60+ (2)	20.9	35.4	16.2	<0.001
P <sub>1-2</sub>	<0.001	<0.001	<0.001	

**Table II.** Smoking rate among native population of the Sakha Republic (Yakutia) districts.

Age groups	All	Men	Women	P
Tattinsky District				
All	37.7	55.6	31.3	<0.001
Age 18–59 (1)	43.9	64.0	36.7	<0.001
Age 60+ (2)	23.8	36.4	19.4	0.108
P <sub>1-2</sub>	<0.01	<0.05	<0.01	
Verkhnevilyuisky District				
All	31.4	41.1	29.0	<0.05
Age 18–59 (1)	36.5	44.1	34.8	0.150
Age 60+ (2)	16.5	33.3	12.0	<0.01
P <sub>1-2</sub>	<0.001	0.335	<0.001	
Verkhoyansky District				
All	39.7	54.1	34.0	<0.001
Age 18–59 (1)	44.3	60.9	37.5	<0.001
Age 60+ (2)	20.9	24.0	19.4	0.654
P <sub>1-2</sub>	<0.001	<0.001	<0.01	
Eveno-Bytantaysky District				
All	43.5	58.7	35.1	<0.001
Age 18–59 (1)	46.9	61.3	38.8	<0.01
Age 60+ (2)	27.7	47.1	17.2	<0.05
P <sub>1-2</sub>	<0.05	0.280	<0.05	

**Table III.** Smoking rate among native population of Yakutia having different chronic NCDs.

	Pathology	No pathology	P
HT (according to BP)	29.4	39.1	<0.001
HT (diagnosed by a specialist)	38.3	29.1	<0.01
Type 2 diabetes	33.3	37.3	0.460
Stroke in past medical history	46.4	36.9	0.149
CHD	33.1	38.2	0.136
MI in past medical history	35.8	37.4	0.823

Group 1: married or having common-law relationship.

Group 2: single.

Group 3: widow (widower).

Group 4: divorced or living apart.

Statistical data was processed by SPSS v19.0 software package. Statistic estimation includes descriptive analysis of indicators numerical characteristics (averaged values, standard deviations) and their division. We used such methods as selections comparison (Mann–Whitney U test, Student’s t-test) and contingency table analysis (Fisher’s exact test, Pearson’s chi-squared test). Normality of distri-

bution was confirmed by the Kolmogorov–Smirnov test. The results were considered significant if  $p < 0.05$ .

## RESULTS

According to our data, the occurrence of smoking among adult population of the Sakha Republic (Yakutia) amounts to 37.4%. There are more male smokers (52.6%) than female (31.9%). We noticed that there are two times less smokers among older people. This tendency is traced in both gender groups (Table I).

**Table IV.** Smoking rate among non-native population of the Sakha Republic (Yakutia).

Age groups	All	Men	Women	P
All	41.8	62.8	31.4	<0.001
Age 18–59 (1)	43.5	63.3	33.5	<0.001
Age 60+ (2)	22.5	55.6	11.3	<0.001
P <sub>1-2</sub>	0.001	0.513	0.001	

**Table V.** Smoking rate related to psychosocial factors.

Factors	All	men	women	P
Education level				
Secondary level; secondary vocational level; lower than secondary level (1)	41.3	54.0	35.9	<0.001
Higher (2)	25.8	43.5	21.8	<0.001
P <sub>1-2</sub>	<0.001	0.111	<0.001	
Marital status				
Married	37.6	52.0	31.1	<0.001
Single	37.0	54.4	33.2	<0.001
P <sub>1-2</sub>	0.831	0.684	0.474	
Labor specificity				
Sedentary work	27.3	43.8	23.9	<0.001
Standing work	35.0	63	29.4	<0.001
Manual work	47.8	58.3	40.6	<0.001
Nervous work	39.5	50.0	35.8	0.098
Domestic work	32.6	40.4	30.4	0.175
P	<0.001	0.083	<0.001	
Depression				
Presence of depression (1)	37.1	46.7	34.0	0.378
Absence of depression (2)	37.0	51.4	31.7	<0.001
P <sub>1-2</sub>	0.987	0.718	0.735	

Analysis of the smoking rate for native habitants from different districts of the republic has proven that the spread of smoking does not vary to a large extent; it is almost the same for all the districts and does not exceed 40%, except for Evenko-Bytantaysky District, where the smoking rate is a bit higher (43.5%). The higher smoking rate among men is consistent in all the districts. However, we can observe more explicit age-related gradation of the women's smoking rate (Table II).

We can observe age-related decrease in the men's smoking rate in Tattinsky and Verkhoyansky Districts. In Verkhnevelyuisky and Eveno-Bytantaysky Districts the number of young and mature men smokers is approximately equal. It is important to note that almost 60% of working-age men from the examined districts are smokers, except for men from Verkhnevelyuisky District (44.1%). This negative situation can be observed for women as well. More than 30% of women aged 18–59 smoke (Table II).

In our study, we analyzed the smoking rate among patients with CVD and T2D (Table III). Among the people diagnosed with hypertension (HT), there are more smokers than among the people without this medical condition. On the contrary, in the

group of people diagnosed with HT at the examination for taking blood pressure, there were fewer smokers than in the group, in which HT was not registered. Patients with CHD, Myocardial infarction (MI) in past medical history, cerebrovascular accident (CVA) and type 2 diabetes (T2D), are smokers to the same degree as the other group. This indicates that this category of the examined are exposed to the risk of cardiovascular aggravations.

The analysis of smoking rate among non-native population has shown that this risk factor is frequent for general group of the examined non-native habitants. We observed age-related decrease of this parameter (Table IV). At the same time, we noticed that the smoking rate is 2 times higher among non-native men compared to non-native women: 62.8% and 31.4% respectively. The smoking rate is high for men regardless of the age. As for non-native women, the smoking rate is 3 times higher for working-age representatives of this group, compared to the senior ones.

We did not find any differences in the smoking rate for native and non-native habitants. However, we discovered that the smoking rate for non-native men is higher than for native men. Such difference is more explicit for senior men.

**Table VI.** Smoking rate related to psychosocial factors in Tattinsky District.

Age groups	All	men	women	P
Secondary level; secondary vocational level; lower than secondary level (1)	42.0	58.6	34.1	<0.001
Higher (2)	30.3	50.0	25.9	0.101
P <sub>1-2</sub>	0.095	0.583	0.279	
Marital status				
Married	36.1	56.9	27.9	<0.001
Single	45.7	57.9	41.2	0.212
P <sub>1-2</sub>	0.162	0.938	0.085	
Labor specificity				
Sedentary work	26.5	44.4	22.5	0.178
Standing work	36.7	80.0	28.0	0.028
Manual work	52.4	69.2	40.5	0.025
Nervous work	55.2	85.7	45.5	0.062
Domestic work	23.4	27.3	22.2	0.729
P	<0.001	<0.05	0.164	
Depression				
Presence of depression (1)	38.3	40.0	33.3	0.850
Absence of depression (2)	37.5	58.0	31.8	<0.001
P <sub>1-2</sub>	0.963	0.439	0.955	

**Table VII.** Smoking rate related to psychosocial factors in Verkhnevilyuisky District.

Age groups	All	men	women	P
Secondary level; secondary vocational level; lower than secondary level (1)	33.8	41.1	31.8	0.037
Higher (2)	23.9	30.8	22.8	0.532
P <sub>1-2</sub>	0.070	0.483	0.127	
Marital status				
Married	31.3	40.4	28.4	0.189
Single	33.3	33.3	33.3	0.352
P <sub>1-2</sub>	0.678	0.599	0.357	
Labor specificity				
Sedentary work	24.4	25.0	24.3	0.948
Standing work	22.4	50.0	17.1	0.041
Manual work	40.0	40.0	40.0	1.000
Nervous work	32.3	33.3	31.9	0.919
Domestic work	28.4	38.5	25.9	0.368
P	0.068	0.738	<0.05	
Depression				
Presence of depression (1)	37.5	60.0	42.1	0.475
Absence of depression (2)	38.3	35.7	29.8	0.337
P <sub>1-2</sub>	0.131	0.278	0.259	

In this study we analyzed the relationship between psychosocial factors and smoking, which is a key risk factor for CVDs. The smoking rate is higher for people with secondary and higher level of education among the examined

native habitants. However, the rate in both groups is high for men, while it is lower for women with higher education (Table V). The relationship between smoking and labor specificity is also observed for women. Smoking rate is

**Table VIII.** Smoking rate related to psychosocial factors in Verkhoyansky District.

Age groups	All	men	women	P
Secondary level; secondary vocational level; lower than secondary level (1)	42.9	52.0	38.3	<0.05
Higher (2)	23.1	75.0	13.6	<0.01
P <sub>1-2</sub>	0.50	0.367	<0.05	
Marital status				
Married	39.7	52.6	35.2	0.181
Single	38.8	53.1	34.6	0.059
P <sub>1-2</sub>	0.901	0.973	0.939	
Labor specificity				
Sedentary work	20.3	53.8	13.1	<0.001
Standing work	37.5	57.1	33.3	0.237
Manual work	49.5	60.4	38.3	<0.05
Nervous work	36.0	33.3	36.8	0.876
Domestic work	41.0	38.1	42.1	0.749
P	<0.001	0.419	<0.01	
Depression				
Presence of depression (1)	23.1	0	25.0	0.569
Absence of depression (2)	39.9	52.5	33.8	<0.01
P <sub>1-2</sub>	0.223	0.296	0.529	

**Table IX.** Smoking rate related to psychosocial factors in Eveno-Bytantaysky District.

Age groups	All	men	women	P
Eveno-Bytantaysky District				
Secondary level; secondary vocational level; lower than secondary level (1)	50.4	62.7	43.2	<0.05
Higher (2)	29.7	42.9	26.0	0.222
P <sub>1-2</sub>	<0.01	0.181	<0.05	
Marital status				
Married	48.7	58.2	43.2	0.108
Single	31.4	66.7	23.8	<0.05
P <sub>1-2</sub>	<0.05	0.631	<0.05	
Labor specificity				
Sedentary work	38.0	58.3	33.9	0.112
Standing work	43.5	60.0	38.9	0.400
Manual work	56.1	54.2	58.8	0.767
Nervous work	46.9	75.0	30.0	<0.05
Domestic work	12.5	50.0	0	0.064
P	0.147	0.816	0.102	
Depression				
Presence of depression (1)	38.5	50.0	33.3	0.569
Absence of depression (2)	42.8	59.6	34.0	<0.01
P <sub>1-2</sub>	0.763	0.706	0.968	

higher for the representatives of professions related to manual labor. Regardless of marital status and depression, we observe high smoking rate both for men and women.

Following the detailed analysis, we can observe that the relationship between psychosocial factors and CVD risk factors varies between districts. In Tattinsky District we do not trace the relation

of the difference factors with education level, marital status and depression. However, we can see explicit relationship between labor specificity and smoking, especially among men (Table VI).

For Verkhnevilyuisky District, the same as for Tattinsky District, we observe a clear relationship between labor specificity and smoking, especially among women (Table VII). We did not discover any differences as regards to the rest of the factors.

In Verkhoyansky District, the smoking rate is higher for women with secondary or secondary vocational level of education. However, this relationship is smoothed out in the total reference set as there is a large number of smoking men with higher education. We can see explicit relationship between labor specificity and smoking, especially among women (Table VIII). We did not discover any differences as regards to the rest of the factors.

For Eveno-Bytantaysky District, we can observe a small number of married women and women with higher education. We did not discover any relationship of smoking with the rest of psychosocial factors (Table IX).

## DISCUSSION

Smoking is a recognized cause of many diseases and the cause of 50% of avoidable deaths of smokers, half of them are due to cardiovascular diseases [4].

In our study, it was found that patients with coronary artery disease, myocardial infarction (MI), acute cerebrovascular accident (ACVA), and type 2 diabetes, compared with those without these pathologies, smoke equally, which indicates a high risk of cardiovascular complications in this category of patients. The results of clinical studies and laboratory experiments conducted by Capewell S. et al. also show that a decrease in mortality from coronary heart disease can occur quickly after individual or population measures to change the diet or quit smoking [3].

Higher education levels are associated with lower smoking prevalence among indigenous and newcomers. Despite a decline in smoking prevalence in Europe, it remains widespread among people with low educational attainment; differences in the frequency of smoking cessation depending on the level of education in recent years have been observed in many European countries [6]. In previous studies, the risk associated with smoking in women is significantly higher than in men [8], which is confirmed by our study. This may be due to differences in the metabolism of nicotine, and is also confirmed by the data that women are more passive smokers, which does not reduce their risk of developing diseases of the cardiovascular system [7].

Studies carried out by many scientists [7, 8], as well as our data have shown that low socioeconomic status, lack of social support, stress at work and in the family, depression, anxiety, hostility, in association with smoking, increase the risk of developing cardiovascular diseases, contribute to the deterioration of the clinical course and prognosis of cardiovascular diseases.

## CONCLUSIONS

We determined a high spread of psychosocial risk factors for the examined respondents – the relationship between smoking, overweight, obesity, abdominal obesity and HT, and the level of education, marital status and labor specificity. Taking

into consideration high CHD occurrence and wide spread of smoking, we can assume that decrease in the spread of passive smoking will significantly improve the situation.

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## Conflict of interest:

*The Authors declare no conflict of interest.*

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