

# Factors associated with desire to quit smoking among Estonian physicians: Cross-sectional data of 2002 and 2014

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## ABSTRACT

**INTRODUCTION** Smoking is a major health threat and quitting smoking would be a notable benefit. The aim of the present study was to explore factors associated with desire to quit smoking among Estonian physicians in 2002 and 2014.

**METHODS** Self-reported data of current smokers were drawn from Estonian physicians' cross-sectional postal surveys in 2002 (n=322) and 2014 (n=189). A logistic regression model was used to analyse the association between desire to quit smoking and factors related to smoking behaviour among 'current smokers'.

**RESULTS** The prevalence of desire to quit smoking among physicians was 55.3% in 2002 and 52.9% in 2014. Physicians who were concerned about harms of smoking, had higher odds for desire to quit compared with those who were not concerned (OR=9.06; 95% CI: 4.15–19.74). Compared to physicians with no quit attempts, odds for desire to give up smoking were significantly higher among physicians with quit attempts. Wish to set a good example was significantly associated with desire to quit (OR=2.38; 95% CI: 1.12–5.09). Compared to specialist doctors, dentists had higher odds for desire to quit smoking (OR=2.42; 95% CI: 1.25–4.69).

**CONCLUSIONS** More than half of Estonian smoking physicians expressed the desire to quit. Desire to quit was associated with concern about harms of smoking, number of previous quit attempts, setting a good example, and medical specialty. The findings suggest that there is a need for smoking cessation counselling services that are addressed, especially for physicians in Estonia.

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## INTRODUCTION

Smoking as a modifiable risk factor is associated with chronic diseases and is currently responsible for over 6 million deaths each year<sup>1,2</sup>. Quitting smoking would be a significant health benefit<sup>3</sup> but is often difficult to achieve due to nicotine dependence<sup>4</sup>. Physicians have the opportunity and obligation to advise people on quitting smoking but at the same time have been shown to be less active in addressing patients' smoking when they are smokers themselves<sup>5,6</sup>.

A behaviour change, such as quitting smoking, demonstrates distinguishable stages, like those in the states-of-change model: pre-contemplation, contemplation, preparation, action and maintenance<sup>7</sup>. A person's attitude towards quitting smoking can be reflected by, for example, a person's desire or

intention to quit<sup>8</sup>.

Intention to quit smoking has been associated with gender<sup>9</sup>, age<sup>10</sup>, education<sup>10</sup>, income<sup>10</sup>, number of previous quit attempts<sup>9,11,12</sup>, nicotine dependence<sup>9</sup>, alcohol consumption<sup>9</sup> and environmental factors<sup>13</sup>. So, to facilitate smoking cessation among physicians, it is important to analyse quitting smoking among them.

In Estonia, smoking surveys<sup>14-17</sup> have been carried out among physicians in 1978, 1982, 2002 and 2014. A definite decrease in smoking prevalence among physicians has been reported over the surveys period. Age-standardized prevalence of current smoking among younger than 65-years-old male physicians was 26.8% in 2002 and 15.3% in 2014, while among female physicians it was 10.4% and 5.8%,

respectively<sup>18</sup>.

The aim of the present paper was to explore factors associated with desire to quit smoking among Estonian physicians who were 'current smokers' in 2002 and 2014.

## METHODS

### Study design

The data were drawn from Estonian physicians' cross-sectional smoking surveys conducted in 2002 and 2014. The surveys were carried out as postal questionnaires initially involving all practicing physicians in Estonia (n=4140 in 2002, and n=5666 in 2014; crude response rates were 66.3% and 51.9%, while corrected response rates were 67.8% and 53.1%, respectively). The methods have been described thoroughly elsewhere<sup>17,19</sup>.

The current study sample was restricted to under 65-years-old 'current smoker' physicians, who gave answers regarding desire to quit smoking in 2002 (n=322) and in 2014 (n=189).

The surveys in 2002 and 2014 were approved by the Research Ethics Committee of the University of Tartu (Decisions No. 87/1 and 235/T-12, respectively). An informed consent form including a description of the study design and how the collected data would be used was sent to the recipients with the questionnaires. The form explained that participation in the study constituted consent, thus additional written consent was not obtained.

### Variables

The main outcome indicator was desire to quit smoking (yes, no, cannot say). Factors associated with desire to quit smoking were: current smoking frequency, factors related to smoking behaviour, background characteristics, and study year. Smoking frequency was based on answers to several questions and classified as: 1) daily smokers (those who currently smoke every day), and 2) occasional smokers (those who currently smoke but not every day).

The following questions were used regarding factors related to smoking behaviour: concern (not concerned, concerned) about harms of smoking; number (none, 1-2, 3-4, ≥5) of previous quit attempts; main reason (stress, strong withdrawal symptoms, alcohol consumption, weight gain,

smoking in proximity, other) to restart smoking; and motivation (personal health problems, material stimulus, wish to set a good example, other) to quit smoking. To determine reason to restart smoking and motivator to quit smoking, the respondents were required to check one answer from the list provided.

Background characteristics used in this study were the following: gender; age group in years (≤34, 35-44, 45-54, 55-64); ethnicity (Estonian, non-Estonian); place of residence (Tallinn, other city, rural); medical specialty (family physicians, specialist doctors, dentists); study year (2002, 2014).

### Data analysis

Distributions of physicians by desire to quit smoking, smoking frequency, factors related to smoking behaviour and background characteristics were calculated along with the mean age of respondents and standard deviation. To determine association between desire to quit smoking and factors related to smoking behaviour, multiple logistic regression analysis was used. Dichotomized desire to quit smoking (yes; no: no and cannot say) was used as dependent variable and all other factors as explanatory variables in logistic regression models. Logistic regression analysis was performed with two models, Model 1 (adjusted for gender, age and year) and Model 2 (adjusted for all explanatory variables). Odds ratios (OR) and 95% confidence intervals (CI) were calculated.

Questionnaires with lacking smoking status values (n=11) and data concerning desire to quit smoking (n=12) were excluded from the analysis. In total, 511 questionnaires were included in the final analysis. Questionnaires without information concerning factors related to smoking behaviour and background characteristics were excluded from the logistic regression models.

## RESULTS

### Characteristics of the sample

Number of respondents was 322 in 2002 and 189 in 2014. Age range of physicians was 27-64 years in 2002 and 25-64 years in 2014, with mean age  $45.4 \pm 9.3$  and  $49.7 \pm 10.4$ , respectively. In both study years, more than two-thirds of smoking respondents were females (67.1% in 2002, and 65.1% in 2014).

Overview of background characteristics is

provided in Table 1. In 2002, the highest proportion of respondents was in age group 35–44 (36.0%), while in 2014 it was in age group 55–64 (40.2%). Most of the respondents were of Estonian ethnicity (82.9% in 2002, and 78.3% in 2014) and nearly half of respondents (43.8% in 2002, and 43.4% in 2014) were residents of other cities (excluding Tallinn). More than half of respondents were specialist doctors (58.4% in 2002, and 56.6% in 2014).

The prevalence of desire to quit smoking was

55.3% in 2002 and 52.9% in 2014 (Table 2). In 2002, almost a third (30.1%) remained undecided whereas in 2014 this proportion was 22.2%. Among ‘current smokers’, the majority were daily smokers in both study years (64.3% in 2002, and 77.8% in 2014). Majority of physicians (77.3% in 2002, and 79.4% in 2014) were concerned about the harms of smoking (Table 2). In 2002 the percentage of physicians who had 3–4 previous smoking quit attempts was 21.4%, while in 2014 it was 16.4%. Among reasons to restart

**Table 1. Distribution of background characteristics (n, %) among smoking physicians by gender and study year in Estonia, 2002 (n=322) and 2014 (n=189)**

Characteristic	2002						2014					
	Men		Women		Total		Men		Women		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
<b>Age group (Years)</b>												
≤34	18	17.0	27	12.5	45	14.0	12	18.2	11	8.9	23	12.2
35–44	35	33.0	81	37.5	116	36.0	7	10.6	18	14.6	25	13.2
45–54	35	33.0	67	31.0	102	31.7	22	33.3	43	35.0	65	34.4
55–64	18	17.0	41	19.0	59	18.3	25	37.9	51	41.5	76	40.2
<b>Ethnicity</b>												
Estonian	85	81.0	182	84.3	267	82.9	46	69.7	102	82.9	148	78.3
Non-Estonian	20	19.0	34	15.7	54	16.8	20	30.3	21	17.1	41	21.7
<b>Place of residence</b>												
Tallinn	39	37.5	82	40.6	121	38.1	28	42.4	50	40.7	78	41.3
Other city	43	41.3	98	48.5	141	44.3	28	42.4	54	43.9	82	43.4
Non-urban	22	21.2	22	10.9	56	17.6	10	15.2	19	15.4	29	15.3
<b>Medical specialty</b>												
Family physician	13	12.7	32	15.5	45	14.6	5	7.7	31	25.6	36	19.3
Specialist doctor	77	75.5	111	53.9	188	60.8	47	72.3	60	49.6	107	57.2
Dentist	12	11.8	63	30.6	76	24.6	13	20.0	30	24.8	44	23.5

**Table 2. Distribution of main outcome (desire to quit smoking), smoking frequency and factors related to smoking behaviour (n, %) among physicians by gender and study year in Estonia, 2002 (n=322) and 2014 (n=189)**

Characteristic	2002						2014					
	Men		Women		Total		Men		Women		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
<b>Desire to quit smoking</b>												
Yes	56	52.9	122	56.2	178	55.3	39	59.1	61	49.6	100	52.9
No	19	17.9	28	13.4	47	14.6	19	28.8	28	22.8	47	24.9
Cannot say	31	29.2	66	30.4	97	30.1	8	12.1	34	27.6	42	22.2
<b>Smoking frequency</b>												
Occasional	30	28.3	85	39.4	115	35.7	15	22.7	27	22.0	42	22.2
Daily	76	71.7	131	60.6	207	64.3	51	77.3	96	78.0	147	77.8
<b>Concern about harms of smoking</b>												
Concerned	78	77.2	171	79.9	249	79.0	53	82.8	97	78.9	150	80.2
Not concerned	23	22.8	43	20.1	66	21.0	11	17.2	26	21.1	37	19.8

Continued

Table 2. Continued

Characteristic	2002						2014					
	Men		Women		Total		Men		Women		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
<b>Previous quit attempts</b>												
None	29	27.4	66	31.1	95	29.9	18	28.6	31	26.1	49	26.9
1–2	35	33.0	85	40.1	120	37.7	21	33.3	59	49.6	80	44.0
3–4	25	23.6	44	20.8	69	21.7	14	22.2	17	14.3	31	17.0
5 or more	17	16.0	17	8.0	34	10.7	10	15.9	12	10.1	22	12.1
<b>Main reason to restart smoking</b>												
Stress	32	34.8	67	39.6	99	37.9	23	43.4	44	42.7	67	42.9
Withdrawal symptoms	10	10.9	8	4.7	18	6.9	11	20.8	9	8.7	20	12.8
Alcohol consumption	7	7.6	3	1.8	10	3.8	9	17.0	2	1.9	11	7.1
Weight gain	8	8.7	19	11.2	27	10.3	4	7.5	17	16.5	21	13.5
Smoking in proximity	19	20.7	44	26.0	63	24.1	4	7.5	20	19.4	24	15.4
Other	16	17.4	28	16.6	44	16.9	2	3.8	11	10.7	13	8.3
<b>Motivation to quit smoking</b>												
Personal health problems	65	67.7	138	71.9	203	70.5	42	75.0	78	74.3	120	74.5
Material stimulus	7	7.3	5	2.6	12	4.2	4	7.1	1	1.0	5	3.1
Wish to set a good example	14	14.6	33	17.2	47	16.3	6	10.7	16	15.2	22	13.7
Other	10	10.4	16	8.3	26	9.0	4	7.1	10	9.5	14	8.7

smoking, stress was most prevalent in both study years (30.7% in 2002, and 35.4% in 2014), followed by smoking in proximity and weight gain. Two-thirds of physicians (63.0% in 2002, and 63.5% in 2014) stated that personal health problems could motivate them to quit smoking. Wish to set a good example was the second most prevalent motivator for quitting.

### Association between desire to quit smoking and factors related to smoking

According to the results of the fully adjusted logistic regression model, desire to quit smoking was significantly associated with being concerned about

the harms of smoking, number of previous quit attempts, wish to set a good example, and medical specialty (Table 3). After full adjustment, daily smoking appeared not to be associated with the higher desire to quit smoking but the wish to set a good example was.

Compared to the physicians who were not concerned about harms of smoking, odds for desire to quit smoking were significantly higher among physicians being concerned about harms of smoking (OR=9.06; 95% CI: 4.15–19.74). Compared to physicians who had not tried to quit smoking, odds for desire to quit smoking were significantly higher

Table 3. Pooled analysis of the association between desire to quit smoking (yes vs no) and smoking frequency, factors related to smoking behaviour, background characteristics, and study year among physicians in Estonia, 2002 (n=322) and 2014 (n=189)

Characteristic	Model 1 <sup>a</sup>		Model 2 <sup>b</sup>	
	OR	95% CI	OR	95% CI
<b>Smoking frequency</b>				
Occasional	1.00		1.00	
Daily	1.83	1.24–2.71	1.56	0.87–2.80
<b>Factors related to smoking behaviour</b>				
<b>Concern about harms of smoking</b>				
Not concerned	1.00		1.00	
Concerned	7.95	4.63–13.66	9.06	4.15–19.74

Continued

Table 3. Continued

Characteristic	Model 1 <sup>a</sup>		Model 2 <sup>b</sup>	
	OR	95% CI	OR	95% CI
<b>Number of previous quit attempts</b>				
None	1.00		1.00	
1–2	<b>2.37</b>	1.51–3.73	<b>2.22</b>	1.18–4.17
3–4	<b>9.31</b>	5.06–17.13	<b>10.58</b>	4.51–24.79
5 or more	<b>13.88</b>	6.03–31.95	<b>9.81</b>	3.63–26.49
<b>Main reason to restart smoking</b>				
Stress	1.00		1.00	
Strong withdrawal symptoms	1.11	0.53–2.33	0.75	0.29–1.99
Alcohol consumption	0.85	0.33–2.18	1.66	0.43–6.26
Weight gain	0.64	0.33–1.23	0.69	0.29–1.66
Smoking in proximity	0.80	0.46–1.37	0.72	0.35–1.47
Other	0.60	0.32–1.11	0.81	0.35–1.88
<b>Motivation to quit smoking</b>				
Personal health problems	1.00		1.00	
Material stimulus	0.71	0.26–1.90	0.38	0.08–1.80
Wish to set a good example	1.46	0.85–2.51	<b>2.38</b>	1.12–5.09
Other	1.05	0.54–2.04	1.99	0.76–5.25
<b>Background characteristics</b>				
<b>Gender</b>				
Male	1.00		1.00	
Female	0.96	0.66–1.39	1.19	0.66–2.12
<b>Age group</b>				
≤34	1.00		1.00	
35–44	1.01	0.56–1.82	0.77	0.32–1.82
45–54	0.94	0.53–1.66	0.87	0.38–2.01
55–64	0.70	0.38–1.26	0.69	0.29–1.68
<b>Ethnicity</b>				
Estonian	1.00		1.00	
Non-Estonian	1.23	0.78–1.94	1.54	0.76–3.09
<b>Place of residence</b>				
Tallinn	1.00		1.00	
Other city	0.94	0.64–1.37	0.87	0.49–1.54
Non-urban	1.53	0.90–2.59	0.96	0.46–2.01
<b>Medical specialty</b>				
Specialist doctor	1.00		1.00	
Family physician	1.58	0.95–2.62	1.88	0.89–4.01
Dentist	<b>1.76</b>	1.12–2.76	<b>2.42</b>	1.25–4.69
<b>Study year</b>				
2002	1.00		1.00	
2014	0.99	0.68–1.44	0.95	0.54–1.68

a Model 1 adjusted for gender, age and year. b Model 2 adjusted for all the other characteristics in the Table.

among physicians who had 1–2, 3–4, and ≥5 attempts to give up smoking. Compared to physicians who agreed with the statement that health problems are the best motivators to quit smoking, odds for desire to stop smoking were significantly higher among

physicians who agreed that setting a good example was the main reason to quit smoking (OR=2.38; 95% CI: 1.12–5.09). Compared to specialist doctors, desire to stop smoking was significantly higher among dentists (OR=2.42; 95% CI: 1.25–4.69).

No significant associations were found with any factors listed under main reason to restart smoking, with almost all factors listed as motivators to quit smoking (except wish to set a good example), with sociodemographic factors (gender, age, ethnicity, and place of residency), and with study year.

## DISCUSSION

In the current paper, factors associated with desire to quit smoking were explored among Estonian physicians in 2002 and 2014.

### Prevalence of desire to quit smoking and factors related to smoking behaviour

According to the results of the study, more than half of smoking physicians indicated a desire to quit smoking in 2002 and 2014. These proportions are comparable, for example, to those of Poland in 2004 where about 60% of physicians wished to quit, but lower than those of the Czech Republic in 1995 where about 75% of smokers intended to quit<sup>20</sup>. Although the proportion of physicians who had a desire to quit smoking was similar in both years among 'current smoker' physicians in Estonia, the prevalence of daily smokers and the proportion of those who did not want to quit smoking was higher in 2014 than in 2002. The higher prevalence of daily smokers might indicate smokers with a stronger nicotine dependence who were not determined to quit.

Studies concerning quitting smoking usually measure intention to quit, not desire to quit. However, both reflect the general attitude towards quitting<sup>8</sup>. Desire to quit has been stated as an important factor in smoking cessation as it reflects motivation but, on the other hand, is different from actually intending to quit and has been merely seen to predict quit attempts and not the success of cessation<sup>7,21</sup>. The questionnaire used in this study explored only desire to quit smoking because the survey focus was on smoking behaviour in general.

In this paper, stress, smoking in proximity and withdrawal symptoms were reported to be the most important reasons for restarting smoking. These findings are in accordance with previous results<sup>22</sup>. Smoking in proximity was the second most mentioned reason but the prevalence of this declined notably from 2002 to 2014. The decline

might be due to smoking decline in general but also because in Estonia smoking in health care establishments is prohibited. The current Tobacco Act, enforced in 2005 and revised several times, is in accordance with EU and WHO tobacco policies and places extensive restrictions to smoking in public and in establishments like schools, hospitals and restaurants.

In our study, personal health problems and wish to set a good example were the most prevalent motivators for quitting. Previous findings also suggested that concern for personal health and wishing to set a good example are the most important reasons among medical staff and the general population<sup>23,24</sup>.

Previous studies have also shown a connection between nicotine dependence and smoking cessation<sup>22,23,25</sup>. In the Estonian physicians' smoking surveys, nicotine dependence was measured only in 2014, and so it was not possible to include these data in the present study.

### Associations between desire to quit smoking and factors related to smoking behaviour

Desire to quit smoking was found to be significantly associated with being concerned about harms of smoking, number of previous quit attempts, and wish to set a good example. These findings are in accordance with previous studies<sup>10,25</sup>. Attempts to quit have been shown to be associated with intention to quit and are considered an important predictor of cessation success<sup>12,25</sup>. In the present study, compared to respondents who had no quit attempts, physicians who had 1–2, 3–4 or  $\geq 5$  quit attempts, had higher odds for desire to quit. Similarly, to previous findings, Estonian physicians who were concerned about the harms of smoking were more likely to desire to quit<sup>10,25</sup>. These associations could indicate that a person is aware of the damaging effects of smoking, is motivated to quit, has tried but failed and so is in need of cessation support.

None of the reasons for relapse was significantly associated with desire to quit smoking in this study. In previous studies, alcohol consumption has been found to be associated with intention to quit smoking. Smokers who had higher number of drinks per week were less likely to intend to quit smoking<sup>10</sup>. The questionnaire that was used to collect data for

this study did not measure alcohol consumption.

In motivators for quitting, only wish to set a good example was significantly associated with desire to quit smoking among physicians in Estonia. As doctors are considered role models, it was expected that setting a good example would be a significant finding among Estonian physicians, as well. Material stimulus was not significantly associated with desire to quit in our study. This was somewhat expected as physicians can be considered as having higher socioeconomic status. However, in contrast, among the general population, material incentives have been described as important factors in quitting smoking, thus increasing the prices of tobacco products should be prioritized when designing tobacco control programs<sup>26,27</sup>.

The association between desire to quit smoking and medical specialty showed that compared to specialist doctors, dentists had significantly higher odds for desire to quit smoking. The association was not significant for family physicians. While this last aspect was unexpected, the finding for dentists was predictable as they are in close contact with the patient and therefore aware of the devastating effects of smoking on oral health. The lack of a notable difference between family physicians and medical specialists could be explained by the distribution of specialties among physicians — only about 10% of medical specialists were surgeons in this study. It has been shown elsewhere that, among male physicians, surgeons had the highest prevalence of smoking compared to other specialities<sup>28</sup>.

No association was found between desire to quit smoking, gender and age among physicians in Estonia. There is little information about whether gender is associated with desire and intent to quit smoking worldwide but the findings concerning successful cessation tend to show that women are less likely to stay abstinent<sup>23,25,29,30</sup>. It is possible that among women who desire to quit, less have serious health conditions that would otherwise motivate them to abstain from relapses. However, as men tend to be less active in seeking medical help, their health problems could be more serious and so motivating them to remain abstinent. Older age has also been shown to be a predictor of successful cessation, with increased cessation rates observed among those who were aged 45 years or older<sup>23</sup>. However, intention

to quit has been shown to decrease with increasing age<sup>25</sup>. These findings might reflect a relationship between health issues and quitting smoking, since it has been shown that smoking physicians tend to believe that many people have smoked all their lives to an old age and did not become ill, hence smoking is not as dangerous as experts declare<sup>18</sup>.

In this study, no association was found between desire to quit smoking and study year. This finding was unexpected since between 2002 and 2014 several major legislative changes occurred in terms of tobacco policy in Estonia. Also, most of the major hospitals joined the network for tobacco-free health services<sup>31</sup> and now promote smoking cessation among their staff. However, smoking in health care establishments has been prohibited by the Tobacco Act in force from 2005.

### Limitations and strengths

First, this study relied on self-reported data, thus self-representation bias should be considered since smokers tend to underestimate the amount smoked<sup>32</sup>. Second, the response rates of 67.8% in 2002 and 53.1% in 2014 may indicate underrepresentation of smokers. Third, as smoking prevalence has been declining, the sub-samples of smoking physicians were small. This may have led to limited statistical power in detecting differences. Despite these limitations, Estonian physicians' smoking surveys provide excellent opportunity to analyse smoking behaviour as physicians can be considered as a homogenous sample and the survey methods were similar in both years.

### CONCLUSIONS

More than half of Estonian physicians who smoked had a desire to quit smoking and nearly one-third was not sure about this. Desire to quit smoking was significantly associated with being concerned about harms of smoking, number of previous quit attempts, setting a good example and medical specialty.

The findings indicate that there is a need for smoking cessation counselling services that are addressed, especially for physicians in Estonia. In addition to face-to-face based counselling, alternatives like telephone and internet-based interventions should be considered to motivate quitting and support abstinence among physicians.

## REFERENCES

1. WHO global report on trends in prevalence of tobacco smoking 2015. Geneva:WHO;2015.
2. Reitsma MB, Fullman N, Ng M, Salama JS, Abajobir A, Abate KH, et al. Smoking prevalence and attributable disease burden in 195 countries and territories, 1990–2015: a systematic analysis from the Global Burden of Disease Study 2015. *Lancet*. 2017;389:1885–906.
3. Jha P, Ramasundarahettige C, Landsman V, Rostron B, Thun M, Anderson RN, et al. 21st-century hazards of smoking and benefits of cessation in the United States. *N Engl J Med* 2013;368:341–50. doi:10.1056/nejmsa1211128
4. DiFranza JR, Savageau JA, Rigotti NA, Fletcher K, Ockene JK, McNeill AD, et al. Development of symptoms of tobacco dependence in youths: 30 month follow up data from the DANDY study. *Tob Control*. 2002;11:228–35. doi:10.1136/tc.11.3.228
5. Meshefedjian GA, Gervais A, Tremblay M, Villeneuve D, O’Loughlin J. Physician smoking status may influence cessation counseling practices. *Can J Public Heal*. 2010;101:290–3.
6. Alajmi B, Abu-hammad O, Al-sharrad A, Dar-odeh N. Tobacco cessation support among dentists: A cross-sectional survey in Saudi Arabia and Kuwait. *Tob Prev Cessat*. 2017;3:121. doi: 10.18332/tpc/75795
7. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: applications to addictive behaviors. *J Addict Nurs* 1993;5(1):2–16. doi: 10.3109/10884609309149692
8. Malle BF, Moses LJ, Baldwin DA, editors. *Intentions and Intentionality*. The MIT Press; 2001.
9. Marques-Vidal P, Melich-Cerveira J, Paccaud F, Waeber G, Vollenweider P, Cornuz J. Prevalence and factors associated with difficulty and intention to quit smoking in Switzerland. *BMC Public Health* 2011;11(1):227. doi:10.1186/1471-2458-11-227
10. Myung SK, Seo HG, Cheong YS, Park S, Lee WB, Fong GT. Association of sociodemographic factors, smoking-related beliefs, and smoking restrictions with intention to quit smoking in Korean adults: findings from the ITC Korea survey. *J Epidemiol* 2012;22(1):21–7. doi:10.2188/jea.je20110026
11. Haddad LG, Petro-Nustas W. Predictors of Intention to Quit. *Can J Public Heal*. 2006;97:9–13.
12. Hyland A. Individual-level predictors of cessation behaviours among participants in the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006;15(suppl\_3). doi/10.1136/tc.2005.013516
13. Myung SK, McDonnell DD, Kazinets G, Seo HG, Moskowitz JM. Relationships between household smoking restrictions and intention to quit smoking among Korean American male smokers in California. *J Korean Med Sci*. 2010;25(2):245–50. doi:10.3346/jkms.2010.25.2.245
14. Väärt E, Vahtra M, Rahu M, et al. Eesti arstkonna suitsetamishõlmavuse ankeetküsitlus. *Nõukogude Eesti Tevishoid* 1979;58:279–81.
15. Rahu M, Raudsepp J. Teine Eesti NSV arstkonna suitsetamislevimuse ankeetküsitlus 1982. aastal. *Nõukogude Eesti Tevishoid* 1986;65:258–61.
16. Pärna K, Rahu K, Rahu M. Smoking habits and attitudes towards smoking among Estonian physicians. *Public Health* 2005;119(5):390–9. doi:10.1016/j.puhe.2004.07.005
17. Pärna K, Pöld M, Ringmets I. Trends in smoking behaviour among Estonian physicians in 1982–2014. *BMC Public Health* 2017;18(1):55. doi:10.1186/s12889-017-4596-x
18. Pöld M, Pärna K. Smoking prevalence and attitudes towards smoking among Estonian physicians: results from cross-sectional studies in 2002 and 2014. *BMJ Open* 2017;7(11):e017197. doi:10.1136/bmjopen-2017-017197
19. Pärna K, Rahu K, Barengo NC, Rahu M, Sandström PH, Jormanainen VJ, et al. Comparison of knowledge, attitudes and behaviour regarding smoking among Estonian and Finnish physicians. *Soz Praventivmed*. 2005;50(6):378–88. doi:10.1007/s00038-005-4089-z
20. Abdullah AS, Stillman FA, Yang L, Luo H, Zhang Z, Samet JM. Tobacco use and smoking cessation practices among physicians in developing countries: A literature review (1987–2010). *Int J Environ Res Public Health*. 2014;11(1):429–55. doi:10.3390/ijerph110100429
21. Smit ES, Hoving C, Schelleman-Offermans K, West R, de Vries H. Predictors of successful and unsuccessful quit attempts among smokers motivated to quit. *Addict Behav* 2014;39(9):1318–24. doi:10.1016/j.addbeh.2014.04.017
22. Al-Turkstani AHM, Alkail BA, Hegazy AA, Asiri SI. Knowledge, attitude, and practice among primary health-care physicians toward smoking cessation in Makkah, Saudi Arabia. *Int J Med Sci Public Heal* 2016;5(4):714–24. doi:10.5455/ijmsph.2016.13112015224
23. Hyland A, Li Q, Bauer JE, Giovino GA, Steger C, Cummings KM. Predictors of cessation in a cohort of current and former smokers followed over 13 years. *Nicotine Tob Res*. 2004;6(6):363–9. doi:10.1080/14622200412331320761
24. Bannasar Veny M, Pericas Beltrán J, González Torrente S, Seguí González P, Aguiló Pons A, Tauler Riera P. Self-perceived factors associated with smoking cessation among primary health care nurses: a qualitative study. *Rev Lat Am Enfermagem* 2011;19(6):1437–44. doi:10.1590/s0104-11692011000600022
25. Vangeli E, Stapleton J, Smit ES, Borland R, West R. Predictors of attempts to stop smoking and their success in adult general population samples: A systematic review. *Addiction*. 2011;106(12):2110–21. doi:10.1111/j.1360-0443.2011.03565.x



26. Hill S, Amos A, Clifford D, Platt S. Impact of tobacco control interventions on socioeconomic inequalities in smoking: review of the evidence. *Tob Control*. 2014;23:e89–e97. doi:10.1136/tobaccocontrol-2013-051110
27. Hoffman SJ, Tan C. Overview of systematic reviews on the health-related effects of government tobacco control policies. *BMC Public Health*. 2015;15(1):744. doi:10.1186/s12889-015-2041-6
28. Yao T, Ong M, Lee A, Jiang Y, Mao Z. Smoking knowledge, attitudes, behavior, and associated factors among Chinese male surgeons. *World J Surg*. 2009;33(5):910–7. doi:10.1007/s00268-009-9938-0
29. Caponnetto P, Polosa R. Common predictors of smoking cessation in clinical practice. *Respir Med*. 2008;102(8):1182–92. doi:10.1016/j.rmed.2008.02.017
30. Piper ME, Cook JW, Schlam TR, Jorenby DE, Smith SS, Bolt DM, et al. Gender, race, and education differences in abstinence rates among participants in two randomized smoking cessation trials. *Nicotine Tob Res*. 2010;12:647–57. doi:10.1093/ntr/ntq067
31. ENSH. Global Network for Tobacco Free Health Care Services. <http://www.ensh.org/members.php>. Accessed June 29, 2018.
32. Patrick DL, Cheadle A, Thompson DC, Diehr P, Koepsell T, Kinne S. The validity of self-reported smoking: A review and meta-analysis. *Am J Public Health*. 1994;84:1086–93. doi:10.2105/ajph.84.7.1086

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