

# Smoking cessation practice among family doctors in Lithuania: a Survey

R. Everatt<sup>1,2</sup>, E. Zolubiene<sup>1</sup>, M. C. Grassi<sup>3</sup>

<sup>1</sup>Department of Research, Centre of Public Health Technologies, Institute of Hygiene, Didzioji g. 22, LT-01128 Vilnius, Lithuania;

<sup>2</sup>Laboratory of Cancer Epidemiology, National Cancer Institute, P. Baublio 3B, LT-08406 Vilnius, Lithuania; <sup>3</sup>Department of Physiology and Pharmacology "V. Erspamer", Sapienza University of Rome, School of Medicine, Rome, Italy

## Abstract

**Objectives.** Relatively low proportion of ex-smokers and high rates of smoking-related diseases are estimated in Lithuania. The aim of this survey was to assess the extent of smoking cessation assistance among family doctors in Lithuania, and to identify factors associated with cessation interventions.

**Materials and Methods.** Data were collected using a questionnaire addressing family doctors' cessation assistance practice; knowledge of smoking epidemiology and health effects; knowledge of cessation assistance guidelines; smoking status; and attendance on Courses/Conferences on Smoking and smoking cessation Assistance (CCSA). The study included 718 family doctors in Lithuania in 2014.

**Results.** The results show that 23% of family doctors always ask their patients about smoking habits. Although 59% of family doctors always advise smoking patients to quit smoking, only 26% recommend a follow-up appointment, 22% refer for a specialized smoking cessation treatment, 15% prescribe nicotine replacement therapy, and 6% prescribe Varenicline or Bupropion. The study demonstrated limited knowledge of family doctors in relation to epidemiological aspects of tobacco use and effective cessation assistance methods. Cessation assistance is influenced by family doctors' age, smoking status, knowledge of cessation assistance guidelines and CCSA attendance.

**Conclusions.** Effective training of family doctors' in smoking epidemiology, health hazards and in smoking cessation assistance is warranted in Lithuania. In addition, coordinated efforts in primary health care institutions are required to improve help for smokers who intend to quit. *Clin Ter 2016; 167(5):161-167. doi: 10.7417/CT.2016.1949*

**Key words:** tobacco, chronic disease prevention, family doctors, knowledge of cessation assistance guidelines, smoking cessation assistance

## Introduction

Tobacco smoking has been classified by the International Agency for Research on Cancer as an important cause of

many cancers (1). Smoking substantially increases mortality from several other major diseases, including cardiovascular diseases, respiratory diseases, and tuberculosis. A smoker's life expectancy is ten years shorter than that of a non-smoker: half of smokers lose 20 years of healthy life before dying from a tobacco-related disease (2). Relatively high rates of cardiovascular diseases and oral cavity, pharyngeal, oesophageal, laryngeal, lung, pancreatic and other smoking-related cancers among men are estimated in Lithuania (3,4). The implementation of the law on tobacco control and WHO Framework Convention on Tobacco Control possibly contributed to the decline in smoking prevalence among men in recent decade in Lithuania; nevertheless, 33% of men aged 20-64 years and 12% of women are current smokers (5-7). Among daily smokers, 29.6% report that during the last year they had received advice from a doctor to give up smoking, younger smokers and women are advised to quit smoking less often (7). However, 66.0% of daily smokers report they would like to quit smoking (7). The proportion of ex-smokers in Lithuania is low (18%), compared to  $\geq 30\%$  in Sweden, The Netherlands, and Denmark (8).

It has been shown that stopping smoking before the age of 40 avoids more than 90% of the excess mortality caused by continuing smoking (9). Most smokers want to quit, but are unable to stop smoking because of the addictiveness of nicotine; therefore, a health professional has the duty to intervene and initiate tobacco cessation (10). Recommendations for clinicians on effective tobacco dependence counselling methods and medication treatments on smoking cessation have been elaborated (10,11). This paper presents the results from a survey among family doctors in Lithuania with the aim to assess the level of smoking cessation assistance. We also measured family doctors' tobacco-related knowledge, smoking habits, as well as attendance on Courses/Conferences on Smoking and cessation Assistance (CCSA), and the importance of these factors in smoking cessation assistance practice.

*Correspondence:* Dr Maria Caterina Grassi, M.D., Professor of Pharmacology and Toxicology, Department of Physiology and Pharmacology "V. Erspamer" - Sapienza University of Rome, School of Medicine, Piazzale Aldo Moro, 5 - 00185 Rome - Italy. Tel. +39 06 49912496, Fax: +39 06 4450618, Mob: +39 335 6188151. E-mail: caterina.grassi@uniroma1.it

## Materials and Methods

### Study population

We conducted a cross-sectional survey among family doctors in Lithuania. There is no register of family doctors in Lithuania; however, according to the statistics, there were 1923 family doctors at the end of 2013 (12). A convenience sample of 382 Primary Health Care Institutions (PHCI) was obtained by identifying all PHCI, available through the Internet sites of the health ministry, municipalities, health institutions, etc. The manager of each PHCI was contacted by e-mail or by telephone, the study was explained and permission to send a questionnaire to all staff family doctors was asked. In total, 1098 anonymous questionnaires were distributed to family doctors at 124 PHCI that agreed to take part in the survey; 774 (70.5%) questionnaires were returned. We excluded questionnaires if 20% or more questions on knowledge had missing information ( $n=20$ ), and questionnaires with missing information on age, sex, and smoking habit ( $n=36$ ); thus, a total of 718 questionnaires were analysed in this study.

The questionnaire was anonymous and self-administered. Its content was designed on the basis of a questionnaire used to assess the knowledge of students at medical schools in a study in Italy (13). Additional questions concerning family doctors' smoking cessation assistance practice were included. The family doctors were asked to indicate on a 4-point scale (*never, seldom, often and always*) how often they: i) ask their patients about smoking and advise smoking patients to quit, ii) recommend their smoking patients use quitting aids, and iii) what are the barriers and ways for improving smoking cessation assistance. When family doctors were asked to indicate how often they recommend specialized smoking cessation treatment to smoking patients, the types of aids were: i) pharmacological treatment with Nicotine Replacement Therapy (NRT), ii) Varenicline or Bupropion, iii) a follow-up appointment with the family doctor, iv) an appointment for a specialized smoking cessation service, v) acupuncture. Barriers to smoking cessation assistance were determined by the following questions: "What problems arise when helping smokers to quit smoking?" (5 response items), and "In your opinion, what measures are necessary to improve smoking cessation assistance?" (5 response items). Overall, the questionnaire included 2 demographic questions (age and sex), 4 occupational questions (length of employment as family doctor; title; state/private type of primary care institution; CCSA attendance during the last year), 10 questions about the knowledge of smoking epidemiology and harmful effects of smoking (i.e. smoking-attributable mortality, tobacco toxins, health risks associated with smoking, and benefits of smoking cessation), 9 questions related to clinical guidelines on tobacco dependence treatment, 4 questions about smoking cessation assistance practice and barriers and 12 questions about family doctor's personal smoking habits. The questionnaires were distributed and collected by the staff of PHCI or regional public health centres in September–December 2014. The study protocol was approved by the Institutional Review Board of the Institute of Hygiene, Ministry of Health of the Republic of Lithuania. Ethical permission was not required by the Regional

Biomedical Research Ethical Committee in Vilnius, because the study was not considered a biomedical research, but a survey with no vulnerable groups involved (14).

### Statistical analysis

To evaluate knowledge on smoking and smoking cessation, two scores were computed (13). *Score 1* was obtained using 10 questions (14 items) relating to knowledge of smoking epidemiology, harmful effects and benefits of quitting, and for each question assigning 0–2 points (0 = *incorrect answer or no answer*; 1 = *not far from the correct answer*; 2 = *correct answer or in an acceptable range, depending on the question*). The sum for an individual could range from 0 to 28. A score of 60% was used to represent a sufficient level of knowledge. Similarly, using 7 questions (12 items) relating to knowledge of smoking cessation assistance methods and their effectiveness, *Score 2* was computed, with the maximum possible sum for individual 24.

Mean and Standard Deviation (SD) was calculated for continuous variables, and percentage and frequency for categorical variables. Using the ANOVA test and Pearson's chi-square respectively, comparisons of variables by age group, knowledge level, CCSA attendance and smoking status of family doctors were analyzed. As there was a strong correlation between work duration and age (0.67,  $p<0.001$ ), only age was retained in the analysis. A  $p$  value of less than 0.05 was regarded as statistically significant. Statistical analyses were performed using SPSS (Version 19) package (SPSS, Inc., Chicago, IL, USA).

## Results

Table 1 shows the main characteristics of the study group. The mean age of participants was  $51.5\pm 11.5$  year (range 27–79 years), and mean work duration as family doctor was  $17.4\pm 11.2$  years (range <1–53 years). Most family doctors were female (84.3%) and worked in state primary health care institutions (72.4%). Moreover, 18.1% of family doctors took part in CCSA. Among the study participants, only 6.0% were current smokers and 16.7% were former smokers; there was higher percentage of smokers among men, than among women. Among current smokers, 62.8% attempted to quit smoking in the past and relapsed, 25.6% seriously considered quitting smoking within the next 6 months, and 37.2% would like to quit, but are not ready to try now (data not shown).

### Knowledge of smoking epidemiology, harmful effects and benefits of cessation

Most participants knew that the component of tobacco smoke, increasing the risk of cancer the most is tar (82.5%), that smoking strongly increases the risk of premature birth (84.4%), and that quitting smoking at any age reduces the risk of premature death (91.5%) (Tab. 2). The majority of family doctors were aware of smoking effect on lung cancer, chronic obstructive pulmonary disease and the sudden death of infants. However, only 13.4% of family doctors knew the number of people who die due to smoking in

Table 1. Characteristics of study participants (n=718).

Variable		n (%) or mean±SD
Sex	Women	605 (84.3)
	Men	113 (15.7)
Age (years)		51.5±11.5
Work duration (years)		17.4±11.2
Work in	State PHCI <sup>a</sup>	520 (72.4)
	Private PHCI	128 (17.8)
	State and private PHCI	70 (9.7)
District	Vilnius	219 (30.5)
	Klaipeda	142 (19.8)
	Kaunas	128 (17.8)
	Alytus	54 (7.5)
	Siauliai	50 (7.0)
	Panevezys	43 (6.0)
	Other	81 (11.3)
	Missing information	1 (0.1)
CCSA attendance <sup>b</sup>	Yes	130 (18.1)
	No	562 (78.3)
	Missing information	26 (3.6)
Smoking habit		
Total (n=718)	Current smoker	43 (6.0)
	Former smoker	120 (16.7)
	Never smoker	555 (77.3)
Men (n=113)	Current smoker	22 (19.5)
	Former smoker	34 (30.1)
	Never smoker	57 (50.4)
Women (n=605)	Current smoker	21 (3.5)
	Former smoker	86 (14.2)
	Never smoker	498 (82.3)

<sup>a</sup> PHCI: Primary Health Care Institution;

<sup>b</sup> CCSA: Courses/Conferences on Smoking and smoking cessation Assistance during the last year

Lithuania, 18.2% - the prevalence of smoking, 17.8% - the percentage of smokers who would like to quit, and 5.6% - the percentage of coronary heart disease caused by smoking. There were no significant differences between smokers and non-smokers, except that more non-smokers than smokers correctly indicated the percentage of lung cancer caused by smoking ( $p=0.01$ ) (Tab. 2). Furthermore, more family doctors who have attended CCSA compared to those who have not, correctly indicated that quitting smoking at any age reduces the risk of premature death ( $p=0.01$ ). In contrast, more non-attendees than attendees were aware of the component of smoke that increases the risk of cancer most, or the influence of smoking on gestational diabetes (Tab. 2). Overall, the level of knowledge relating to smoking epidemiology, harmful effects of smoking and benefits of cessation (*Score 1*) exceeded the minimum acceptable for 16.2% of family doctors (data not shown). There were no statistically significant differences by smoking status or CCSA attendance (Tab. 2).

#### Knowledge of smoking cessation assistance methods

Only 26.4% of family doctors reported that they thought they had enough knowledge to help a person who asks for smoking cessation support, and only 11.4% knew of a centre for specialized smoking cessation support in their town (Tab. 3). The majority (98.9%) of family doctors knew that it is necessary to advise all smokers to quit smoking, and that nicotine addiction, like heroin and cocaine (15) is a substance-related and addictive disorder (70.4%). However, low proportion of them were aware that a doctor, during every visit, should ask the patient if he smokes (43.6%), that a doctor's short counselling is effective (37.2%), NRT is not contraindicated to individuals with cardiovascular diseases (35.9%), or that acupuncture is not effective (12.5%). More non-smoker than smoker family doctors knew that it is necessary to advise all smokers to quit ( $p<0.001$ ), and correctly estimated the effectiveness of NRT ( $p=0.05$ ) or smoking cessation programs/courses ( $p=0.03$ ) (Tab. 3). More CCSA attendees than non-attendees stated that they had enough knowledge to help a person intending to quit smoking ( $p<0.001$ ); correctly estimated the effectiveness of doctor's short counselling ( $p=0.03$ ), and the effectiveness of NRT ( $p=0.04$ ) (Tab. 3). The estimated level of knowledge of smoking cessation assistance methods (*Score 2*) exceeded the minimum acceptable among 7% of family doctors (data not shown); it was significantly higher among those who attended CCSA (Tab. 3).

#### Providing smoking cessation help

Among family doctors, 22.8% stated that they always ask each patient if he/she smokes, 29.0% always inform smoking patient about the benefits of smoking cessation, and 59.2% always advise to quit smoking (Tab. 4). Moreover, 25.5% always or often schedule another meeting with the family doctor, 22.3% always or often give a referral for specialized treatment on smoking cessation, 15.0% always or often prescribe NRT, and 5.6% prescribe Varenicline or Bupropion. There were no significant differences in smoking cessation practice by level of knowledge relating to smoking epidemiology and health hazards (*Score 1*) (Tab. 4). Among family doctors with higher than sufficiency level *Score 2*, 35.3% prescribed NRT, 21.6% Varenicline or Bupropion, and 41.2% scheduled the next meeting with the family doctor. The corresponding figures for those below the sufficiency threshold were 13.5%, 4.3% and 24.3%, respectively (Tab. 4). Non-smoker family doctors, with respect to smokers, significantly more often advised smoking patients to quit smoking. In addition, CCSA attendees significantly more often prescribed Varenicline or Bupropion, scheduled the next meeting with the family doctor, and referred the patient to specialized smoking cessation treatment.

Older family doctors, compared to younger ones, significantly more often reported that they always ask the patient if she/he smokes, inform smoking patients about the benefits of cessation, and refer to specialized cessation treatment (Tab. 4). In contrast, younger family doctors were more likely to prescribe NRT.

Table 2. Comparison of family doctors' knowledge level of smoking epidemiology, harmful effects and benefits of cessation.

Questionnaire items (The correct answer in parentheses)	Correct/acceptable answers (%)				
	Total (n=718)	Smokers (n=43)	Non-smokers (n=675)	CCSA attendance <sup>a,b</sup>	
				Yes (n=130)	No (n=562)
Number of deaths/year due to smoking in Lithuania (5000–7000)	13.4	11.6	13.5	14.6	13.3
No of chemicals in tobacco smoke ( $\geq 4000$ )	30.1	23.3	30.5	26.9	30.2
Which component increases most the risk of cancer? (Tar)	82.5	86.0	82.2	73.1	84.7'
Percentage of smokers in Lithuania (11%–30%)	18.2	23.3	17.9	16.9	19.0
Percentage of smokers who would like to quit (61%–80%)	17.8	16.3	17.9	18.5	18.1
Time from quitting smoking till the risk becomes equal to non-smokers					
Heart diseases (6–15 years)	34.3	30.2	34.5	34.6	33.3
Lung cancer (never)	18.2	9.3	18.8	23.1	17.8
Percentage of diseases due to smoking					
Lung cancer (80%–90%)	51.4	32.6	52.6'	54.6	49.8
Chronic obstructive pulmonary disease (80%–90%)	54.5	55.8	54.4	49.2	56.0
Coronary artery diseases (20%–30%)	5.6	7.0	5.5	3.8	6.0
Smoking in pregnancy affects the risk of:					
Gestational diabetes (no increase)	16.2	23.3	15.7	10.8	18.0'
Sudden Infant Death Syndrome (large increase)	70.8	67.4	71.0	70.0	70.8
Premature birth (large increase)	84.4	76.7	84.9	85.4	84.2
Quitting smoking at any age reduces risk of premature death (Yes)	91.5	90.7	91.6	96.9	90.2'
Score 1 (mean $\pm$ SD)	47.6 $\pm$ 11.7	46.4 $\pm$ 13.9	47.6 $\pm$ 11.5	46.7 $\pm$ 11.4	47.8 $\pm$ 11.8

<sup>a</sup> CCSA: Courses/Conferences on Smoking and smoking cessation Assistance during the last year; <sup>b</sup> n=26 missing data for CCSA attendance; \*P<0.05 between groups of smoking status or CCSA attendance

The results show that 86% of family doctors always or often lack time for smoking cessation assistance, 69% lack information on the newest methods of cessation assistance, and 57% lack knowledge on how to change a patient's attitude towards smoking. Among family doctors who attended CCSA, there were less of those who reported a lack of knowledge and information. Furthermore, 61% of family doctors indicated that better conditions for providing smoking cessation assistance (e.g. more time allocated to each patient, leaflets), more practical teaching (56%), and other staff members' involvement (53%) would be important.

## Discussion

The present survey shows that only 23% of family doctors always ask their patients about smoking. Although majority of family doctors always advise smoking patients to quit smoking, few recommend some type of smoking cessation aid. Most frequently a follow-up appointment or a referral for specialized smoking cessation treatment is recommended, whereas the least often used method is pharmacological treatment with NRT, Varenicline or Bupropion. Our results

show that family doctors' smoking cessation practice was influenced by their smoking status, knowledge of smoking cessation methods, CCSA attendance and age. The study demonstrated limited knowledge among Lithuanian family doctors of a range of topics including the epidemiology and health hazards of tobacco smoking and effective methods to help smokers who intend to stop. Family doctors identified the lack of time and lack of knowledge as main barriers to provision of smoking cessation assistance.

High rates of implementing the Ask, Advise, Assess, Assist and Arrange method were found in previous investigations from USA or the UK: almost all general practitioners reported routinely asking about patient's tobacco use status and providing pharmacological help for patients attempting to quit (16–18). A study, carried out by Kruger et al. (17) showed that 97.1% of primary care doctors consistently enquire about tobacco use, 98.3% recommend medication, counselling, or telephone quitline, and 48% consistently arrange a follow-up visit. However, according to results from France and Germany, 20% and 28.7% of primary care doctors, respectively, always provide brief interventions to assist patients quit smoking (19,20). Similarly, 33.8% of primary care providers in Turkey stated that they always ask, and only



Table 3. Comparison of family doctors knowledge level of smoking cessation assistance guidelines and methods.

Questionnaire items (the correct answer in parentheses)	Correct/acceptable answers (%)				
	Total (n=718)	Smokers (n=43)	Non-smokers (n=675)	CCSA attendance <sup>a</sup> <sup>b</sup>	
				Yes (n=130)	No (n=562)
When should a doctor ask a patient if he smokes? (during each visit)	43.6	39.5	43.9	50.8	41.8
Is it necessary to advise all smokers to quit smoking or only those who have some pathology caused by smoking (all smokers)	98.9	93.0	99.3 <sup>*</sup>	97.7	99.1
Probability that a person will quit smoking increases twice if doctor gives 3-minute counselling and advice on quitting smoking? (Yes)	37.2	32.6	37.5	45.4	35.2 <sup>*</sup>
Nicotine is as addictive as heroin or cocaine? (Yes)	70.8	67.4	71.0	69.2	70.5
Is NRT <sup>c</sup> contraindicated for individuals with cardiovascular diseases? (No)	35.9	25.6	36.6	42.3	34.3
How effective as a method of smoking cessation is:					
Only will and determination (little effective-not effective)	22.8	32.6	22.2	22.3	23.0
Short advice given by the physician (effective)	31.8	27.9	32.0	34.6	31.1
NRT (effective)	44.7	30.2	45.6 <sup>*</sup>	53.1	42.9 <sup>*</sup>
Programs, various courses for smoking cessation (effective-very effective)	74.2	60.5	75.1 <sup>*</sup>	78.5	73.7
Self-help material (little effective-not effective)	39.3	48.8	38.7	33.8	40.6
Acupuncture (Not effective)	12.5	20.9	12.0	14.6	12.1
Do you have enough knowledge to help smokers seeking help? (Yes)	26.6	37.2	25.9	43.1	22.6 <sup>*</sup>
Do you know any centers of specialized smoking cessation support in your town you could recommend to patients intending to quit? (Yes)	11.4	16.3	11.1	13.1	11.0
Score 2 (mean±SD)	41.5±13.2	39.0±15.0	41.6±13.0	44.5±13.7	40.7±13.0 <sup>*</sup>

<sup>a</sup> CCSA: Courses/Conferences on Smoking and smoking cessation Assistance during the last year; <sup>b</sup>n=26 missing data for CCSA attendance

<sup>c</sup> NRT: Nicotine Replacement Therapy; <sup>\*</sup>P<0.05 between groups of smoking status or CCSA attendance

Table 4. Comparison of Smoking Cessation Assistance Practice among family doctors (n=718).

Questionnaire items (The correct answer in parentheses)	Acceptable answers (%)													
	Total	Score 1 <sup>a</sup>		Score 2 <sup>a</sup>		Smoking habit		CCSA attendance <sup>b,c</sup>		Age (years)				
		Low	Sufficient	Low	Sufficient	Smokers	Non-smokers	Yes	No	≤30	31–40	41–50	51–60	≥61
Asks each patient if he smokes (Always)	22.8	23.8	18.1	22.0	33.3	23.3	22.8	28.5	21.4	9.3	11.9	18.2	24.6	34.6 <sup>*</sup>
Informs smoking patient about benefits of smoking cessation (Always)	29.0	30.2	22.4	28.5	35.3	25.6	29.2	32.3	28.5	20.4	26.2	20.9	31.2	37.2 <sup>*</sup>
Advise smoking patient to quit (Always)	59.2	60.0	55.2	58.5	68.6	41.9	60.3 <sup>*</sup>	60.0	59.6	50.0	59.5	58.8	60.1	60.9
Prescribes NRT (Always-Often)	15.0	15.0	15.5	13.5	35.3 <sup>*</sup>	20.9	14.7	19.2	14.4	29.6	14.3	14.9	12.3	15.4 <sup>*</sup>
Prescribes Varenicline/Bupropion (Always-Often)	5.6	5.5	6.0	4.3	21.6 <sup>*</sup>	2.3	5.8	10.8	4.4 <sup>*</sup>	11.1	6.0	7.4	5.4	1.9
Schedules the next meeting with the family physician (Always-Often)	25.5	24.3	31.9	24.3	41.2 <sup>*</sup>	23.3	25.6	33.8	23.5 <sup>*</sup>	31.5	22.6	27.0	26.1	22.4
Gives a referral for specialized smoking cessation treatment (Always-Often)	22.3	22.9	19.0	22.3	21.6	14.0	22.8	34.6	18.9 <sup>*</sup>	11.1	21.4	18.2	22.5	30.1 <sup>*</sup>
Recommends acupuncture (Never)	53.3	52.3	58.6	52.2	68.6 <sup>*</sup>	69.8	52.3 <sup>*</sup>	47.7	54.8	77.8	73.8	56.8	44.6	46.2 <sup>*</sup>

<sup>a</sup> Knowledge level below or above sufficiency threshold of 60% (low or sufficient, respectively); <sup>b</sup> CCSA: Courses/Conferences on Smoking and smoking cessation Assistance during the last year; <sup>c</sup> n=26 missing data for CCSA attendance;

<sup>\*</sup>P<0.05 between groups of knowledge level or smoking habit or CCSA attendance or age

8.4% advise patients to quit smoking (21). Several studies in different countries have indicated that medical students, hospital doctors and primary care providers lack knowledge on smoking risks, epidemiology, benefits of cessation and tobacco dependence treatment guidelines (13,16,22). Moreover, family doctors' knowledge of harmful effects of smoking, attitude to smoking and training background was previously found to influence whether they ask their patients if they smoke, encourage them to stop smoking and provide help to patients intending to quit (16,19,23,24).

Health Behaviour Survey among the Lithuanian population in 2014 showed that approximately 60% of smokers age 55-64 years and less than 30% of younger smokers had received advice to quit smoking during the last year (7). Although the percentage of smokers who have tried to quit smoking is high in Lithuania (75%), only 2% of them had support from a doctor or health professional and 4% used NRT or other medication, compared with 23% in Finland or 20% in Sweden (8). More than three quarters (78%) tried to quit without any assistance compared with 52% in Finland and the UK (8).

The evidence of the extent of smoking cessation assistance and factors associated with it among family doctors in Lithuania is scarce. It was found that the use of smoking cessation methods in family doctors' practice was low compared to primary care providers in the USA and UK (16-18), but similar to reports from other countries, e.g. Germany (19-21). It is of note, that higher rates of family doctors reported advising smoking patients to quit, but few recommended some type of smoking cessation aid; similar to previous reports (8,16). This investigation supports existing evidence of differences in the performance of smoking cessation intervention behaviours by smoking status, level of knowledge and training. Non-smoker family doctors more often than smoker doctors advised smoking patients to quit smoking. Doctors with a sufficient level of knowledge of smoking cessation methods and CCSA attendees were more likely to always/often prescribe NRT, Varenicline or Bupropion or schedule the follow-up meeting. The study also showed that older family doctors less often prescribe pharmacological treatment, whereas younger doctors less often discuss smoking cessation with their patients.

This study showed that low number of family doctors thought they have enough knowledge how to help a person asking for smoking cessation support, or knew centres for specialized smoking cessation treatment. Non-smoker doctors had somewhat better knowledge compared to smokers. Among CCSA attendees, knowledge of smoking cessation methods was higher; they were less likely to report a lack of information. Notably, we did not find a significant positive effect of CCSA attendance on the knowledge of epidemiology and health hazards of smoking. This may be explained, at least in part, by the insufficient quality of training that is provided at the CCSA (25). Results suggest that adequate undergraduate and postgraduate training on tobacco and smoking cessation is required in Lithuania, as well as evaluation of training programs effectiveness at changing family doctors practices and patient smoking habits (25).

Notably, conventional approaches, recommended for clinicians as effective tobacco dependence counselling and medication treatment methods, can be supplemented with electronic aids (e.g. internet sites, computer programs, mobile telephone text messages, as well as electronic cigarettes), and this may increase quit rates and prevent relapses. However, there is insufficient data for the effectiveness of electronic aids for smoking cessation and/or reducing relapse (26, 27), thus in our study their use in family doctors' cessation assistance practice was not investigated. Further research is needed on the relative benefits of different forms and content of electronic aids, and the acceptability of these technologies for smoking cessation among all smokers and within subpopulations, where greater awareness is recommended (26-28).

The present study has several limitations. First, because approximately 40% of family doctors were included, the possibility that the study group does not represent all family doctors in Lithuania remains, although the sample size was large and diverse with respect to the participants' age, geographical area, PHCI type, etc. Second, the participation of PHCI and family doctors in this study could have been related to smoking cessation assistance practice in PHCI, or to the level of knowledge and smoking habits of family doctors. Thus, selection bias cannot be excluded, and it could be that estimates of knowledge and cessation assistance practice are higher and those of smoking prevalence lower than real. A further limitation is that smoking habits and cessation assistance practice were assessed by means of a questionnaire, which could overestimate the extent to which family doctors provide smoking cessation assistance, or underestimate smoking prevalence among them. One final limitation is that the results of analyses by smoking status were based on a small number of smoker family doctors, thus chance cannot be excluded.

## Conclusions

Regular screening and smoking cessation interventions are uncommon in Lithuanian family doctors' practice. Smoking cessation practice is influenced by family doctors' smoking status, knowledge of cessation assistance methods, CCSA attendance and age. Effective undergraduate and postgraduate training of family doctors in tobacco dependence treatment, as well as smoking epidemiology, harmful effects and benefits of cessation is warranted. Coordinated efforts in primary health care institutions are required to improve help to smokers who intend to quit, e.g. allocation of more time to each patient or other staff members' involvement.

## Acknowledgements

We would like to thank to all PHCI and family doctors who participated in the study for their collaboration and valued contributions.

## References

1. International Agency for Research on Cancer (IARC). IARC monographs on the evaluation of carcinogenic risks to humans. A review of human carcinogens: personal habits and indoor combustions. 100E. Lyon, IARC, 2012
2. Jha P, Peto R. Global Effects of Smoking, of Quitting, and of Taxing Tobacco. *N Engl J Med* 2014; 370:60–8
3. Steliarova-Foucher E, O'Callaghan M, Ferlay J, et al. European Cancer Observatory: Cancer Incidence, Mortality, Prevalence and Survival in Europe. Version 1.0 (September 2012) European Network of Cancer Registries, International Agency for Research on Cancer. <http://eco.iarc.fr/> Accessed [10 March 2016]
4. World Health Organization Regional Office for Europe. European health for all database (HFA-DB). Updated: December 2015. <http://data.euro.who.int/hfadb/> Accessed [22 December 2015]
5. World health organization. Global Health Observatory data repository. Tobacco use. Data by country. [http://www.who.int/tobacco/surveillance/policy/country\\_profile/en/](http://www.who.int/tobacco/surveillance/policy/country_profile/en/) Accessed [9 December 2015]
6. World health organization. Global Health Observatory data repository. Tobacco use. Data by country. <http://apps.who.int/gho/data/node.main.65> Accessed [9 December 2015]
7. Grabauskas V, Klumbienė J, Petkevičienė J, et al. Health Behaviour among Lithuanian Adult Population, 2014. Kaunas, Lithuanian University of Health Sciences, 2015
8. Attitudes of Europeans towards Tobacco and Electronic Cigarettes. SPECIAL EUROBAROMETER 429. European Union, 2015
9. Pirie K, Peto R, Reeves GK, et al. The 21st century hazards of smoking and benefits of stopping: a prospective study of one million women in the UK. *Lancet* 2013; 381:133–41
10. European Network for Smoking and Tobacco Prevention (ENSP). European Smoking Cessation Guidelines: The authoritative guide to a comprehensive understanding of the implications and implementation of treatments and strategies to treat tobacco dependence. 1st edition. Brussels, ENSP, 2012
11. Fiore MC, Jaén CR, Baker TB et al. Treating Tobacco Use and Dependence: 2008 Update. Clinical Practice Guideline. Rockville (MD): US Department of Health and Human Services; 2008
12. Lithuanian Ministry of Health, Health Information Centre of Institute of Hygiene. Health Statistics of Lithuania 2013. Vilnius, Health Information Centre of Institute of Hygiene, 2014
13. Grassi MC, Chiamulera C, Baraldo M et al. Cigarette smoking knowledge and perceptions among students in four Italian medical schools. *Nicotine Tob Res* 2012;14(9):1065–72
14. Law on Ethics of Biomedical Research of Republic of Lithuania. 11 May 2000. No VIII-1679. Vilnius. New version: 17 September 2015 – XII-1938
15. Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Fifth Edition. American Psychiatric Association, 2013
16. Applegate BW, Sheffer CE, Crews KM, et al. A survey of tobacco-related knowledge, attitudes and behaviours of primary care providers in Mississippi. *Journal of Evaluation in Clinical Practice* 2008;14:537–44
17. Kruger J, O'Halloran A, Rosenthal A. Assessment of compliance with US Public Health Service Clinical Practice Guideline for tobacco by primary care physicians. *Harm Reduction Journal* 2015; 12:7. DOI 10.1186/s12954-015-0044-3
18. McIlpatrick S, Keeney S, McKenna H, et al. Investigating the role of the general practitioner in cancer prevention: a mixed methods study. *BMC Family Practice* 2013; 14:58
19. De Col P, Baron C, Guillaumin C, et al. [Influence of smoking among family physicians on their practice of giving minimal smoking cessation advice in 2008. A survey of 332 general practitioners in Maine-et-Loire]. *Rev Mal Respir* 2010; 27:431–40. [Article in French]
20. Schneider S, Diehl K, Bock C, et al. Modifying Health Behavior to Prevent Cardiovascular Diseases: A Nationwide Survey among German Primary Care Physicians. *Int J Environ Res Public Health* 2014; 11:4218–32
21. Sonmez CI, Aydin LY, Turker Y et al. Comparison of smoking habits, knowledge, attitudes and tobacco control interventions between primary care physicians and nurses. *Tob Induc Dis* 2015; 13:37. doi: 10.1186/s12971-015-0062-7
22. Raupach T, Merker J, Hasenfuß G, et al. Knowledge gaps about smoking cessation in hospitalized patients and their doctors. *Eur J Cardiovasc Prev Rehabil* 2011;18:334–41
23. Jiang Y, Ong MK, Tong EK et al. Chinese Physicians and Their Smoking Knowledge, Attitudes, and Practices. *Am J Prev Med* 2007; 33:15–22
24. Cornuz J, Humair JP, Seematter L et al. Efficacy of resident training in smoking cessation: a randomized, controlled trial of a program based on application of behavioral theory and practice with standardized patients. *Ann Intern Med* 2002; 136:429–37
25. Kralikova E, Bonevski B, Stepankova L, et al. Postgraduate medical education on tobacco and smoking cessation in Europe. *Drug Alcohol Rev* 2009;28:474–83
26. Naughton F. Delivering 'Just-In-Time' smoking cessation support via mobile phones: Current knowledge and future directions. *Nicotine Tob Res* 2016 May 28. pii: ntw143.
27. Protano C, Di Milia LM, Orsi GB, Vitali M. Electronic cigarette: a threat or an opportunity for public health? State of the art and future perspectives. *Clin Ter* 2015; 166(1):32-7
28. Sernia S, Quaglia V, Sbriccoli B, et al. Changes in tobacco addiction and spirometric variations in workers exposed to chemical risk in biochemical research laboratories of a large Italian University--a retrospective cohort study. *Clin Ter* 2015; 166(1):e34-40.